

# California Fish and Game Commission

## Meeting Binder



October 17, 2018

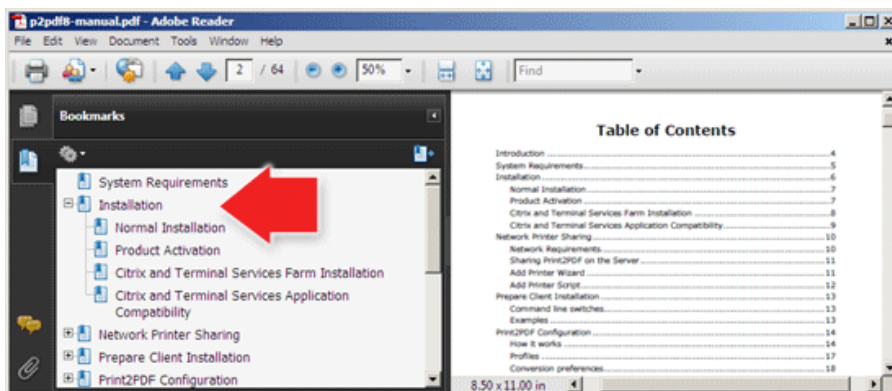
Fresno

## **EASY GUIDE TO USING THE BINDER**

1. Download and open the binder document using your Adobe Acrobat program/app.
2. If a bookmark panel does not automatically appear on either the top or left side of the screen, click/tap on the “bookmark symbol” located near the top left-hand corner.



3. To make adjustments to the view, use the Page Display option in the View tab. You should see something like:



4. We suggest leaving open the bookmark panel to help you move efficiently among the staff summaries and numerous supporting documents in the binder. It's helpful to think of these bookmarks as a table of contents that allows you to go to specific points in the binder without having to scroll through hundreds of pages.
5. You can resize the two panels by placing your cursor in the dark, vertical line located between the panels and using a long click /tap to move in either direction. ←→
6. You may also adjust the sizing of the documents by adjusting the sizing preferences located on the Page Display icons found in the top toolbar or in the View tab.
7. Upon locating a staff summary for an agenda item, notice that you can obtain more information by clicking/tapping on any item underlined in blue.
8. Return to the staff summary by simply clicking/tapping on the item in the bookmark panel.
9. Do not hesitate to contact staff if you have any questions or would like assistance.



## OVERVIEW OF FISH AND GAME COMMISSION BUSINESS MEETINGS

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- This is the 149<sup>th</sup> year of continuous operation of the California Fish and Game Commission in partnership with the California Department of Fish and Wildlife. Our goal is the preservation of our heritage and conservation of our natural resources through informed decision making. These meetings are vital in achieving that goal. In that spirit, we provide the following information to be as effective and efficient toward that end. Welcome and please let us know if you have any questions.
- We are operating under Bagley-Keene Open Meeting Act and these proceedings are being recorded and broadcast via Cal-Span.
- In the unlikely event of an emergency, please note the location of the nearest emergency exits. Additionally, the restrooms are located \_\_\_\_\_.
- Items may be heard in any order pursuant to the determination of the Commission President.
- The amount of time for each agenda item may be adjusted based on time available and the number of speakers.
- Speaker cards need to be filled out legibly and turned in to the staff before we start the agenda item. Please make sure to list the agenda items you wish to speak to on the speaker card.
- We will be calling the names of several speakers at a time so please line up behind the speakers' podium when your name is called. If you are not in the room when your name is called you may forfeit your opportunity to speak on the item.
- When you speak, please state your name and any affiliation. Please be respectful. Disruptions from the audience will not be tolerated. Time is precious so please be concise.
- To receive meeting agendas and regulatory notices about those subjects of interest to you, please visit the Commission's website, [www.fgc.ca.gov](http://www.fgc.ca.gov), and sign up for our electronic mailing lists.
- All petitions for regulation change must be submitted in writing on the authorized petition form, FGC 1, Petition to the California Fish and Game Commission for Regulation Change, available at <http://www.fgc.ca.gov/public/information/petitionforregulatorychange.aspx>.
- **Reminder!** Please silence your mobile devices and computers to avoid interruptions.
- **Warning!** The use of a laser pointer by someone other than a speaker doing a presentation may result in arrest.

# INTRODUCTIONS FOR FISH AND GAME COMMISSION MEETINGS

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## **Fish and Game Commission**

Eric Sklar	President (Saint Helena)
Anthony Williams	Vice-President (Huntington Beach)
Jacque Hostler-Carmesin	Member (McKinleyville)
Russell Burns	Member (Napa)
Peter Silva	Member (Jamul)

## **Commission Staff**

Melissa Miller-Henson	Acting Executive Director
Mike Yaun	Legal Counsel
Susan Ashcraft	Marine Advisor
Ari Cornman	Wildlife Advisor
Sherrie Fonbuena	Analyst
Sergey Kinchak	Analyst

## **California Department of Fish and Wildlife**

Chuck Bonham	Director
Wendy Bogdan	General Counsel
David Bess	Deputy Director and Chief, Law Enforcement Division
Stafford Lehr	Deputy Director, Wildlife and Fisheries Division
Clark Blanchard	Assistant Deputy Director, Office of Communications, Education and Outreach
Kari Lewis	Chief, Wildlife Branch
Kevin Shaffer	Chief, Fisheries Branch
Craig Shuman	Manager, Marine Region

I would also like to acknowledge special guests who are present:  
(i.e., *elected officials, including tribal chairpersons, and other special guests*)

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**Commissioners**  
**Eric Sklar**, President  
Saint Helena

**Anthony C. Williams**, Vice President  
Huntington Beach

**Jacque Hostler-Carmesin**, Member  
McKinleyville

**Russell E. Burns**, Member  
Napa

**Peter S. Silva**, Member  
Jamul

STATE OF CALIFORNIA  
Edmund G. Brown Jr., Governor

## Fish and Game Commission



*Wildlife Heritage and Conservation*  
*Since 1870*

**Melissa Miller-Henson**  
**Acting Executive Director**  
P.O. Box 944209  
Sacramento, CA 94244-2090  
(916) 653-4899  
fgc@fgc.ca.gov  
www.fgc.ca.gov

### MEETING AGENDA October 17, 2018, 8:30 a.m.

**Radisson Fresno Conference Center**  
**1055 Van Ness Avenue, Fresno, CA 93721**

The meeting will be live streamed; visit [www.fgc.ca.gov](http://www.fgc.ca.gov) the day of the meeting.

**NOTES: See important meeting deadlines and procedures at the end of the agenda.**  
**Unless otherwise indicated, the California Department of Fish and Wildlife is identified as Department.**

Call to order/roll call to establish quorum

1. **Consider approving agenda and order of items**
2. **Public comment for items not on agenda**  
Receive public comment regarding topics within the Commission's authority that are not included on the agenda. The Commission **may not** discuss or take action on any matter raised during this item, except to decide whether to place the matter on the agenda of a future meeting. (Sections 11125 and 11125.7(a), Government Code)
3. **Acting executive director's report**  
Receive an update from the Commission's acting executive director on staffing and legislative information of note.
  - (A) Staff report
  - (B) Legislative report, federal regulatory notices, and possible action
4. **Tribal Committee**  
Discuss updates and/or recommendations from the October 16, 2018 committee meeting. Consider approving new topics to address at a future committee meeting.
  - (A) October 16, 2018 meeting summary
    - I. Receive and consider adopting recommendations

- (B) Work plan development
  - I. Update on work plan and draft timeline
  - II. Discuss and consider approving new topics

5. **Marine Resources Committee**

Discuss and consider approving draft agenda topics for the next committee meeting. Consider approving new topics to address at a future committee meeting.

- (A) Work plan development
  - I. Update on work plan and draft timeline
  - II. Discuss and consider approving new topics

6. **Recreational take of purple sea urchin (regular rulemaking)**

Consider authorizing publication of notice of intent to amend regulations for the recreational take of purple sea urchin.  
(Add Section 29.06, Title 14, CCR)

7. **Incidental take allowances for crabs**

Discuss and consider adopting proposed regulations concerning incidental take allowances for crabs, other than genus *Cancer*, in trap fisheries.  
(Subsection 125.1(c)(3), Section 126, and Section 126.1, Title 14, CCR)

8. **Recreational and commercial groundfish**

Discuss proposed changes to recreational and commercial fishing regulations for federal groundfish and associated species for consistency with federal rules for 2019 and 2020.  
(Sections 27.30, 27.35, 27.40, 27.45, 27.50, 28.27, 28.55, 52.10 and 150.16, Title 14, CCR)

9. **Recreational take of red abalone**

Discuss proposed changes to regulations to extend the fishery closure sunset date for the recreational abalone fishery.  
(Section 29.15, Title 14, CCR)

10. **Statewide marine protected areas monitoring action plan**

Consider adopting the statewide marine protected areas monitoring action plan.

11. **Red Abalone Fishery Management Plan**

Receive presentation from the California Ocean Science Trust, discuss peer review results for the draft *Red Abalone Fishery Management Plan*, and discuss next steps.  
(Pursuant to Section 7072 et seq., Fish and Game Code)

12. **Box crab experimental gear permit**

Receive and discuss proposed box crab experimental gear permit (EGP) program, EGP participation criteria, and permit conditions.  
(Pursuant to Fish and Game Code Section 8606)

13. **Marine non-regulatory requests from previous meetings**

Consider non-regulatory requests submitted by members of the public at previous meetings.

- (A) Action on non-regulatory requests
  - I. Request to explore potential abalone/urchin impacts resulting from proposed expansion of Wheeler North Reef
  - II. Request to issue north coast market squid research permits
  - III. Request to review regulations and policies for harvesting giant keyhole limpets
  - IV. Recommendation to separate the Commission into two bodies
- (B) Action on pending non-regulatory requests referred to staff or the Department for review – None scheduled

14. **Petitions for regulation change (marine and wildlife/inland fisheries)**

Consider requests submitted by members of the public to adopt, amend or repeal a regulation.

(Pursuant to Section 662, Title 14, CCR)

- (A) Action on current petitions
  - I. Petition #2018-010 AM 1: Convert non-transferable commercial nearshore permits to transferable permits
- (B) Action on pending regulation petitions referred to staff and the Department for review
  - I. Petition #2015-014: Mendocino, Sonoma and Marin counties' coastal streams
  - II. Petition #2015-015: Russian River fishing regulations and minimum flow requirements

15. **Departmental informational items**

The Department will highlight items of note since the last Commission meeting.

- (A) Director's report
  - I. Update on tricolored blackbird population estimates and progress with safe harbor agreements
  - II. State Water Resources Control Board Phase 1 – Bay Delta Plan and Department involvement
- (B) Law Enforcement Division
- (C) Wildlife and Fisheries Division, and Ecosystem Conservation Division
  - I. Update on efforts to eradicate nutria in California
- (D) Marine Region

16. **Strategic planning**

Discuss and consider action on proposed mission, vision and core values, and discuss next steps in the strategic planning process.

## **CONSENT ITEMS**

**17. California sheephead**

Consider authorizing publication of notice of intent to amend regulations concerning the filleting of California sheephead on vessels at sea.  
(Subsection 27.65(b), Title 14, CCR)

**18. Recreational take of purple sea urchin (emergency)**

Consider adopting a 90-day extension of the emergency regulations concerning recreational take of purple sea urchin.  
(Section 29.11, Title 14, CCR)

**19. Lassics lupine and coast yellow leptosiphon**

Consider adopting proposed changes to regulations to add Lassics lupine (*Lupinus constancei*) and coast yellow leptosiphon (*Leptosiphon croceus*) to the list of California plants declared to be endangered.  
(Section 670.2, Title 14, CCR)

**20. Commercial use and possession of native rattlesnakes**

Consider comments received on the June 11, 2018 15-day notice and adopt the regulations concerning the commercial use and possession of native rattlesnakes for biomedical and therapeutic purposes.  
(Sections 42, 43, 651, and 703, Title 14, CCR)

**21. Cascades frog**

Receive and consider approving Department request for a six-month extension to submit its status review report on the petition to list Cascades frog (*Rana cascadae*) as an endangered or threatened species under the California Endangered Species Act (CESA). (Pursuant to Section 2074.6, Fish and Game Code)

**22. Upper Klamath-Trinity rivers spring Chinook salmon**

- (A) Receive a petition to list upper Klamath-Trinity rivers spring Chinook salmon (*Oncorhynchus tshawytscha*) as an endangered species under CESA.  
(Pursuant to Section 2073.3, Fish and Game Code, and Section 670.1(c), Title 14, CCR)
- (B) Consider the Department's request for a 30-day extension to review the petition to list upper Klamath-Trinity rivers spring Chinook salmon (*Oncorhynchus tshawytscha*) as an endangered species under CESA.  
(Pursuant to Section 2073.5, Fish and Game Code)

**23. Wildlife Resources Committee**

Discuss updates and recommendations from the September 20, 2018 committee meeting. Consider approving new topics to address at a future committee meeting.

- (A) September 20, 2018 meeting summary
  - I. Receive and consider adopting recommendations
- (B) Work plan development
  - I. Update on work plan and draft timeline
  - II. Discuss and consider approving new topics



24. **Sport fishing (annual)**  
Discuss proposed changes to regulations concerning sport fishing report card requirements for marine and inland waters; clarification that inland waters do not include bays; an increase in fishing opportunities for black bass in Perris Lake; and corrections to authority and reference citations.  
Note: Proposed regulations for sport fishing report card requirements are for both marine and inland waters.  
(Sections 1.53, 1.74, and 5.00, Title 14, CCR)
25. **California Waterfowler's Hall of Fame**  
Commission recognition of newly-inducted members of the California Waterfowler's Hall of Fame.
26. **Jerusalem Creek Ranch PLM**  
Consider revoking, suspending or reinstating the Jerusalem Creek Ranch Private Lands Wildlife Habitat Enhancement and Management Area License.  
(Pursuant to Section 601(e), Title 14, CCR)
27. **Bullfrogs and Non-native Turtles**  
Receive an update on the stakeholder engagement plan and consider approving an updated timeline.
28. **Wildlife and inland fisheries non-regulatory requests from previous meetings**  
Consider non-regulatory requests submitted by members of the public at previous meetings.
- (A) Action on non-regulatory requests
    - I. Request to use non-lethal management strategies for beavers
    - II. Request to schedule approval of Cañada San Vicente Land Management Plan
    - III. Request to engage the Department in ensuring that water settlement agreements support salmon
  - (B) Action on pending non-regulatory requests referred to staff or the Department for reviews – None scheduled
29. **Commission administrative items**  
Discuss and consider action on the upcoming meeting agenda items and rulemaking timetable, and identify any new business for discussion at a future meeting.
- (A) Next meeting – December 12-13, 2018 in Oceanside
  - (B) Potential meeting location changes
  - (C) Rulemaking timetable updates
  - (D) New business

Adjourn

## **EXECUTIVE SESSION**

(Not Open to Public)

At a convenient time during the regular agenda of the meeting listed above, the Commission will recess from the public portion of the agenda and conduct a closed session on the agenda items below. The Commission is authorized to discuss these matters in a closed session pursuant to Government Code Section 11126, subdivisions (a)(1), (c)(3), and (e)(1), and Fish and Game Code Section 309. After closed session, the Commission will reconvene in public session, which may include announcements about acts taken during closed session.

### **(A) Pending litigation to which the Commission is a Party**

- I. Keith Robert Walker v. Kamala Harris et al. (suction dredging)
- II. Dennis Sturgell v. California Fish and Game Commission, California Department of Fish and Wildlife, and Office of Administrative Hearings (revocation of Dungeness crab vessel permit No. CT0544-T1)
- III. Kele Young v. California Fish and Game Commission, et al. (restricted species inspection fee waiver)
- IV. California Cattlemen's Association and California Farm Bureau Federation v. California Fish and Game Commission (gray wolf listing)
- V. Tri-State Crab Producers Assoc. v. California Department of Fish and Wildlife, California Fish and Game Commission (Dungeness Crab "Fair Start" provision in Section 8279.1 of the Fish and Game Code)
- VI. Public Interest Coalition v. California Fish and Game Commission (CEQA compliance during adoption of dog collar regulation)
- VII. Pacific Star Sportfishing, Inc. v. California Fish and Game Commission, et al. (suspension of commercial vessel fishing permit)
- VIII. Aaron Lance Newman v. California Fish and Game Commission (revocation of hunting and sport fishing privileges)

### **(B) Possible litigation involving the Commission**

### **(C) Staffing**

### **(D) Deliberation and action on license and permit items**

- I. Consider the appeal filed by Tyler Reese regarding the Department's suspension of a trapping license.
- II. Consider the appeal filed by Christopher Giannini regarding the Department's suspension of a trapping license.
- III. Consider the Proposed Decision In the matter of the appeal filed by Gregory Janis.

## California Fish and Game Commission 2018 and 2019 Meeting Schedule

**Note:** As meeting dates and locations can change, please visit [www.fgc.ca.gov](http://www.fgc.ca.gov) for the most current list of meeting dates and locations.

2018			
Meeting Date	Commission Meeting	Committee Meeting	Other Meetings
November 14		<b>Marine Resources</b> Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814	
December 12-13	QLN Conference Center 1938 Avenida del Oro Oceanside, CA 92056		
2019			
Meeting Date	Commission Meeting	Committee Meeting	Other Meetings
January 10		<b>Wildlife Resources</b> Ontario	
February 5		<b>Tribal</b> Redding	
February 6-7	Redding		
March 19		<b>Marine Resources</b> Monterey or Marina	
April 17-18	Fresno or Bakersfield		
May 16		<b>Wildlife Resources</b> Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814	
June 11		<b>Tribal</b> Sacramento area	
June 12-13	Sacramento area		
July 11		<b>Marine Resources</b> San Clemente	
August 7-8	Mammoth or Bishop		
September 5		<b>Wildlife Resources</b> Santa Rosa	
October 8		<b>Tribal</b> Los Angeles area	

<b>2019</b>			
<b>Meeting Date</b>	<b>Commission Meeting</b>	<b>Committee Meeting</b>	<b>Other Meetings</b>
October 9-10	Los Angeles area		
November 5		<b>Marine Resources</b> Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814	
December 11-12	San Diego (proposed to move to Sacramento area)		

### **OTHER 2018 AND 2019 MEETINGS OF INTEREST**

#### **Association of Fish and Wildlife Agencies**

- September 22-25, 2019, Saint Paul, MN

#### **Pacific Fishery Management Council**

- November 1-8, 2018, San Diego, CA
- March 5-12, 2019, Vancouver, WA
- April 9-16, 2019, Rohnert Park, CA
- June 18-25, 2019, San Diego, CA
- September 11-18, 2019, Boise, ID
- November 13-20, 2019, Costa Mesa, CA

#### **Western Association of Fish and Wildlife Agencies**

- January 3-6, 2019, Tucson, AZ
- July 11-16, 2019, Manhattan, KS

#### **Wildlife Conservation Board**

- November 15, 2018, Sacramento, CA

## **IMPORTANT COMMISSION MEETING PROCEDURES INFORMATION**

### **WELCOME TO A MEETING OF THE CALIFORNIA FISH AND GAME COMMISSION**

This is the 149<sup>th</sup> year of operation of the Commission in partnership with the California Department of Fish and Wildlife. Our goal is the preservation of our heritage and conservation of our natural resources through informed decision making; Commission meetings are vital in achieving that goal. In that spirit, we provide the following information to be as effective and efficient toward that end. Welcome and please let us know if you have any questions.

### **PERSONS WITH DISABILITIES**

Persons with disabilities needing reasonable accommodation to participate in public meetings or other Commission activities are invited to contact the Reasonable Accommodation Coordinator at (916) 651-1214. Requests for facility and/or meeting accessibility should be received at least 10 working days prior to the meeting to ensure the request can be accommodated.

### **STAY INFORMED**

To receive meeting agendas and regulatory notices about those subjects of interest to you, please visit the Commission's website, [www.fgc.ca.gov](http://www.fgc.ca.gov), to sign up on our electronic mailing lists.

### **SUBMITTING WRITTEN COMMENTS**

The public is encouraged to comment on any agenda item. Submit written comments by one of the following methods: **E-mail** to [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov); **mail** to California Fish and Game Commission, P.O. Box 944209, Sacramento, CA 94244-2090; **deliver** to California Fish and Game Commission, 1416 Ninth Street, Room 1320, Sacramento, CA 95814; or **hand-deliver to a Commission meeting**. Materials provided to the Commission may be made available to the general public.

### **COMMENT DEADLINES**

The **Written Comment Deadline** for this meeting is **5:00 p.m. on October 4, 2018**. Written comments received at the Commission office by this deadline will be made available to Commissioners prior to the meeting.

The **Late Comment Deadline** for this meeting is **noon on October 12, 2018**. Comments received by this deadline will be marked "late" and made available to Commissioners at the meeting.

After these deadlines, written comments may be delivered in person to the meeting – Please bring ten (10) copies of written comments to the meeting.

### **NON-REGULATORY REQUESTS**

All non-regulatory requests will follow a two-meeting cycle to ensure proper review and thorough consideration of each item. All requests submitted by the **Late Comment Deadline** (or heard during public comment at the meeting) will be scheduled for receipt at this meeting, and scheduled for consideration at the next business meeting.

### **PETITIONS FOR REGULATION CHANGE**

Any person requesting that the Commission adopt, amend, or repeal a regulation must complete and submit form FGC 1, titled, "Petition to the California Fish and Game Commission

for Regulation Change” (as required by Section 662, Title 14, CCR). The form is available at <http://www.fgc.ca.gov/public/information/petitionforregulatorychange.aspx>. To be received by the Commission at this meeting, petition forms must have been delivered by the **Late Comment Deadline** (or delivered during public comment at the meeting). Petitions received at this meeting will be scheduled for consideration at the next business meeting, unless the petition is rejected under staff review pursuant to subsection 662(b), Title 14, CCR.

### **VISUAL PRESENTATIONS/MATERIALS**

All electronic presentations must be submitted by the **Late Comment Deadline** and approved by the Commission executive director before the meeting.

1. Electronic presentations must be provided by email to [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).
2. All electronic formats must be Windows PC compatible.
3. It is recommended that a print copy of any electronic presentation be submitted in case of technical difficulties.
4. A data projector, laptop and presentation mouse will be available for use at the meeting.

### **CONSENT CALENDAR**

A summary of all items will be available for review at the meeting. Items on the consent calendar are generally non-controversial items for which no opposition has been received and will be voted upon under single action without discussion. Any item may be removed from the consent calendar by the Commission upon request of a Commissioner, the Department, or member of the public who wishes to speak to that item, to allow for discussion and separate action.

**LASER POINTERS** may only be used by a speaker during a presentation; use at any other time may result in arrest.

### **SPEAKING AT THE MEETING**

To speak on an agenda item, please complete a “Speaker Card” and give it to the designated staff member before the agenda item is announced. Cards will be available near the entrance of the meeting room. Only one speaker card is necessary for speaking to multiple items.

1. Speakers will be called in groups; please line up when your name is called.
2. When addressing the Commission, give your name and the name of any organization you represent, and provide your comments on the item under consideration.
3. If there are several speakers with the same concerns, please appoint a spokesperson and avoid repetitive testimony.
4. The presiding commissioner will allot between one and three minutes per speaker per agenda item, subject to the following exceptions:
  - a. The presiding commissioner may allow up to five minutes to an individual speaker if a minimum of three individuals who are present when the agenda item is called have ceded their time to the designated spokesperson, and the individuals ceding time forfeit their right to speak to the agenda item.
  - b. Individuals may receive advance approval for additional time to speak if requests for additional time to speak are received by email or delivery to the Commission office



by the **Late Comment Deadline**. The president or designee will approve or deny the request no later than 5:00 p.m. two days prior to the meeting.

- c. An individual requiring an interpreter is entitled to at least twice the allotted time pursuant to Government Code Section 11125.7(c).
  - d. An individual may receive additional time to speak to an agenda item at the request of any commissioner.
5. If you are presenting handouts/written material to the Commission at the meeting, please provide ten (10) copies to the designated staff member just prior to speaking.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**2. PUBLIC COMMENT****Today's Item****Information** ☒**Action** ☐

Receive public comments, petitions for regulation change, and requests for non-regulatory actions for items not on the agenda.

**Summary of Previous/Future Actions**

- **Today's receipt of petitions, requests and comments** **Oct 17, 2018; Fresno**
- Consider granting, denying or referring **Dec 12-13, 2018; Oceanside**

**Background**

This agenda item is primarily to provide the public an opportunity to address FGC on topics not on the agenda. Staff also includes written materials and comments received prior to the meeting as exhibits in the meeting binder (if received by written comment deadline), or as late comments at the meeting (if received by late comment deadline), for official FGC "receipt."

Public comments are generally categorized into three types under public forum: (1) petitions for regulation change; (2) requests for non-regulatory action; and (3) informational-only comments. Under the Bagley-Keene Open Meeting Act, FGC cannot discuss any matter not included on the agenda, other than to schedule issues raised by the public for consideration at future meetings. Thus, petitions for regulation change and non-regulatory requests generally follow a two-meeting cycle (receipt and direction); FGC will determine the outcome of the petitions for regulation change and non-regulatory requests received at today's meeting at the next in-person FGC meeting following staff evaluation.

As required by the Administrative Procedure Act, petitions for regulation change will be either denied or granted and notice made of that determination. Action on petitions received at previous meetings is scheduled under a separate agenda item titled "Petitions for regulation change". Action on non-regulatory requests received at previous meetings is scheduled under a separate agenda item titled "Non-regulatory requests."

**Significant Public Comments**

1. New petitions for regulation change are summarized in Exhibit 1, and the original petitions are provided as exhibits 3-4.
2. Requests for non-regulatory action are summarized in Exhibit 2, and the original requests are provided as exhibits 5-6.
3. Informational comments are provided as exhibits 7-9.

**Recommendation**

Consider whether any new future agenda items are needed to address issues that are raised during public comment and are within FGC's authority.

**Exhibits**

1. Summary of new petitions for regulation change received by Oct 4; 2018 at 5:00 p.m.

## STAFF SUMMARY FOR OCTOBER 17, 2018

2. Summary of requests for non-regulatory action received by Oct 4, 2018 at 5:00 p.m.
3. Petition 2018-013: Ridgeback prawn trawl fishing hours, received Sep 19, 2018
4. Petition 2018-014: Boat limit for finfish, received Oct 4, 2018
5. Email from Brigitte Robertson, requesting cancellation of the hunting season in areas affected by recent wildfires, received Aug 17, 2018
6. Email from Steffanie Byrnes, requesting action to reduce the coyote population in urban areas, received Sep 5, 2018
7. Letters from Alpine County Chamber of Commerce Board of Directors, Kirkwood Meadows Public Utility District Board of Directors, and Alpine Watershed Group Board of Directors, in support of a request from the Alpine County Board of Supervisors to remove Hope Valley Wildlife Area from the DFW Lands Pass Program, received Aug 7, Sep 20, and Sep 24, 2018, respectively
8. Email from Eric Mills, Action for Animals, regarding the banning of commercial collection of native freshwater turtles in Texas, received Aug 23, 2018
9. Email from Ace Carter, concerning the testing for radioactive pollution in the ocean environment, received Sep 20, 2018

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**3A. ACTING EXECUTIVE DIRECTOR'S REPORT – STAFF REPORT****Today's Item**Information ☒Action ☐

Receive the acting executive director's staff report, including staffing update and staff time allocations.

**Summary of Previous/Future Actions (N/A)****Background*****Updated Marine Protected Areas (MPA) Statewide Leadership Team (SLT) Work Plan***

In 2015, the California Ocean Protection Council adopted a three-year work plan (2015-18) for its MPA SLT, comprised of coastal state and federal agencies and key partners. The work plan included commitments for FGC staff, as members of the SLT. An updated work plan (2018-21) has recently been completed and again includes commitments for FGC staff participation (Exhibit 2). [Acting](#) Executive Director Melissa Miller-Henson signed a joint SLT letter of support for the work plan on behalf of FGC (Exhibit 3).

***Staffing and Office***

As of late Sep, Executive Director Valerie Termini is on loan to DFW as its chief deputy director; this is a temporary assignment and she is expected to return to FGC in Dec. In the interim, Melissa Miller-Henson is acting executive director.

Aside from the temporary loan, with the hiring of our most recent staff member in Aug, this is the first time in many years that FGC has no vacancies in its permanent, full-time positions. FGC management is developing plans to address the many backlogged workload items, including transitioning the FGC website to a new state template, completing a formal tracking system for regulation change requests, and pursuing additional alternatives for annual rulemakings (as we did for ocean salmon and Pacific halibut).

As noted last month, work has started on the new Natural Resources Building, one block from our current location. Staff has received updated plans which show that, consistent with other new state office buildings, FGC staff will be located in an open floorplan (other than the executive director, deputy executive director and legal counsel). FGC staff will be co-located on the 17th floor with DFW executive offices, legal counsel offices, and legislative, regulatory, climate science, and outreach, communication and education staff. We will continue to share details as they emerge.

In order to increase accessibility, state agencies are converting to a new website template. Staff is working with DFW to convert the FGC website to the new template while striving to ensure that all relevant content remains, even though the layout may look different.

***Staff Activities***

A summary of staff time allocation and activities in Aug and Sep is provided in Exhibit 1. Of special note is that October is National Disability Employment Awareness Month. FGC staff

## STAFF SUMMARY FOR OCTOBER 17, 2018

contributed to planning for public outreach about disability employment awareness as a member of the CDFW Disability Advisory Committee.

**Significant Public Comments (N/A)****Recommendation (N/A)****Exhibits**

1. *Staff Report on Staff Time Allocation and Activities*, dated Oct 8, 2018
2. *MPA Statewide Leadership Team Work Plan Fiscal Year 2018/19 – 2020/21*, dated Oct 2018
3. Letter of support from MPA Statewide Leadership Team to California Ocean Protection Council, dated Aug 20, 2018

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**3B. ACTING EXECUTIVE DIRECTOR'S REPORT – LEGISLATIVE UPDATE AND FEDERAL REGULATORY PROPOSALS****Today's Item****Information** ☒**Action** ☐

Review and discuss legislation of interest and federal regulatory notices, and provide staff direction.

**Summary of Previous/Future Actions**

- |  |                          |
|--|--------------------------|
| • Approved letters to secretaries Zinke and Ross   | Aug 22-23, 2018: Fortuna |
| • Last day for California State Legislature to pass bills; final recess began upon adjournment | Aug 31, 2018             |
| • Last day for Governor Brown to sign or veto bills  | Sep 30, 2018             |
| • General election in California   | Nov 6, 2018              |
| • Legislature adjourns <i>Sine Die</i> at midnight   | Nov 30, 2018             |
| • Legislature convenes 2019-20 regular session   | Dec 3, 2018              |
| • Most new state statutes take effect  | Jan 1, 2019              |

**Background**

FGC staff has prepared a list of legislation that may affect FGC's resources and workload (see below); each description includes a brief synopsis and current bill status. DFW staff prepares a more extensive list of state legislation potentially affecting DFW, which is included as Exhibit 1. Today is an opportunity for FGC to provide direction to staff concerning legislation; at any meeting, FGC may direct staff to provide information to or share concerns with bill authors.

Staff has also included in this summary information about federal regulatory notices with proposed regulation changes for which staff submitted comments on behalf of FGC, per FGC direction at its Aug 22-23, 2018 meeting.

**Federal Legislation**

Below is a list of federal bills that FGC has previously shown an interest in, or may be of interest, and the status as of October 5, 2018.

- *S. 793 Shark Finning – Shark Fin Trade Elimination Act of 2017*: Sen. Cory Booker (NJ).

Status: Senate - 05/18/2017 Committee on Commerce, Science, and Transportation. Ordered to be reported with an amendment in the nature of a substitute favorably.

Summary: This bill makes it illegal to possess, buy, sell, or transport shark fins or any product containing shark fins. A person may possess a shark fin that was lawfully taken consistent with a license or permit under certain circumstances. Penalties are imposed for violations under the Magnuson-Stevens Fishery Conservation and Management Act. The maximum civil penalty for each violation shall be \$100,000, or the fair market value of the shark fins involved, whichever is greater.



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- S. 2773 Driftnet Modernization and Bycatch Reduction Act*: Sen. Dianne Feinstein (CA).  
 Status: Senate – 09/05/2018 Committee on Commerce, Science, and Transportation. Ordered to be reported with an amendment in the nature of a substitute favorably.  
 Summary: This bill calls for prioritizing the phase-out of large-scale driftnet fishing within the nation's exclusive economic zone and promoting alternative fishing methods and gear types, in order to reduce the incidental catch of living marine resources. The bill adds language to the Magnuson-Stevens Fishery Conservation and Management Act to instruct the U.S. secretary of commerce to coordinate a transition program to assist in phasing out large-scale driftnet fishing and adopting alternative fishing methods. The secretary is authorized to provide funding to individuals who surrender their permit for large-scale driftnet fishing, or surrender any gear associated with that permit, and purchase new fishing gear that minimizes the incidental catch of living marine resources. The bill authorizes \$450,000 for each of the fiscal years 2018 through 2020 for the purposes of providing the funding to individuals.
- H.R. 200 – MSA Reauthorization – Strengthening Fishing Communities and Increasing Flexibility in Fisheries Management Act*: Rep. Don Young (AK).  
 Status: Senate - 07/12/2018 received in the Senate and read twice and referred to the Committee on Commerce, Science, and Transportation. Summary: To amend the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to provide flexibility for fishery managers and stability for fishermen, and for other purposes. This bill revises and reauthorizes MSA through Fiscal Year 2022. No revisions have been made since the previous report.
- H.R. 1456 – Shark Fin Sales Elimination Act of 2017*: Rep. Edward Royce (CA).  
 Status: Introduced 03/09/17; Referred to House Committee on Natural Resources; 3/20/17 referred to the Subcommittee on Water, Power and Oceans; 4/17/18 subcommittee hearings held. Summary: This bill makes it illegal to possess, buy, or sell shark fins or any product containing shark fins. A person may possess a shark fin that was lawfully taken consistent with a license or permit under certain circumstances. Penalties are imposed for violations under the Magnuson-Stevens Fishery Conservation and Management Act.
- H.R. 5638 Driftnet Modernization and Bycatch Reduction Act*: Ted Lieu (CA).  
 Status: House – 05/08/2018 Referred to the Subcommittee on Water, Power and Oceans. Summary: This is the companion bill to S. 2773, which calls for prioritizing the phase-out of large-scale driftnet fishing within the nation's exclusive economic zone and promoting alternative fishing methods and gear types, in order to reduce the incidental catch of living marine resources.

**State Legislation**

- AB 1337 (Patterson) Fish and Game Commission: meetings and hearings: live broadcast*.  
 Status: Vetoed by the Governor. Summary: Would require FGC to provide live video broadcast on its Internet website of every FGC meeting or hearing that is open and

## STAFF SUMMARY FOR OCTOBER 17, 2018

public and every meeting or hearing conducted by MRC, WRC, or TC that is open and public.

- *AB 1573 (Bloom) marine fisheries: experimental fishing permits.*

Status: Approved by the Governor and chaptered 9/18/18. Summary: This bill would repeal existing experimental gear permit provisions and instead would authorize FGC to approve experimental fishing permits to be issued by the department for specified purposes that would authorize commercial or recreational marine fishing activity otherwise prohibited by the Fish and Game Code or regulations adopted pursuant to that code. Requires FGC to establish by regulation an expeditious process for DFW review, public notice and comment, FGC approval, and prompt DFW issuance of EFPs.

- *AB 1884 (Calderon) Food facilities: Single-use plastic straws.*

Status: Approved by the Governor and chaptered 9/20/18. Summary: Requires specified restaurants to provide plastic straws only upon request. Specifically, this bill: (1) Prohibits a food facility, as specified, where food may be consumed on the premises from providing single-use plastic straws to consumers unless requested by the consumer. (2) Specifies that the first and second violation shall result in a warning, and any subsequent violations shall constitute an infraction punishable by a fine of \$25 for each day of the violation, not to exceed \$300 annually. (3) Specifies that no reimbursement is required for costs incurred by a local agency or school district because this bill creates a new crime or infraction.

- *AB 2369 (Fletcher) Fishing: Marine protected areas: violations.*

Status: Approved by the Governor and chaptered 8/24/18. Summary: This bill would increase the penalty for unlawfully taking a fish for commercial purposes within a marine protected area to the penalties established for a person who holds a commercial fishing license or a commercial passenger fishing boat license. The bill would also require a person's commercial fishing license or commercial passenger fishing boat license, as applicable, to be revoked if the person is convicted of a second violation of this provision. By changing the penalty for this crime, this bill would impose a state-mandated local program.

- *AB 2958 (Quirk) State bodies: meetings: teleconference.*

Status: Approved by the Governor and chaptered 9/28/18. Summary: Current law, among other things, requires a state body that elects to conduct a meeting or proceeding by teleconference to post agendas at all teleconference locations, to identify each teleconference location in the notice and agenda, and to make each teleconference location accessible to the public. This bill, for a state body that is an advisory board, advisory commission, advisory committee, advisory subcommittee, or similar multimember advisory body, would authorize an additional way of holding a meeting by teleconference, as prescribed, provided it also complies with all other applicable requirements of the Bagley-Keene Open Meeting Act.

- *AB 2805 (Bigalow) Wild pigs.*

Status: 8/27/2018 - Re-referred to Senate Rules. Died in committee. Summary: Would have revised multiple code provisions applicable to wild pigs to, among other things,

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change the designation, expand the definition, switch from wild pig tags to a wild pig validation, and eliminate the requirement to obtain a depredation permit and instead add provisions for take pursuant to regulations adopted by FGC. The bill also authorized California Department of Food and Agriculture to adopt regulations to require marking of swine that meet the new definition of a wild pig. Because a violation of the new provisions would have been a crime, this bill would have imposed a state-mandated local program.

- *SB 187 (Berryhill) Sport fishing licenses: duration.* Introduced: 1/25/2017.

Status: 9/1/2017 - failed deadline pursuant to Rule 61(a)(12). (Last location was Appropriations. Suspense File on 7/19/2017) Summary: Would require a resident or a nonresident, 16 years of age or older, upon payment of a specified fee, to be issued a sport fishing license for the period of 12 consecutive months beginning on the date specified on the license, instead of for the period of a calendar year, or the remainder thereof. The bill would require FGC to include, among the costs required to be recovered by an adjustment of the fee amount, transition costs related to the new licensing period.

- *SB 234 (Berryhill) Fishing: local regulation: report.*

Status: 9/1/2017 - failed deadline pursuant to Rule 61(a)(12). (Last location was Appropriations. Suspense File on 7/19/2017) Summary: Would require FGC to undertake a survey and evaluation of local ordinances that regulate fishing and to submit the survey and evaluation to the legislature in a report by Dec 31, 2018.

- *SB 473 (Hertzberg) California Endangered Species Act.*

Status: 9/10/2018 – Approved by the Governor and chaptered on 9/10/2018. Summary: Among other things, the bill requires DFW to adopt regulations for issuance of incidental take permits and would apply take prohibitions to public agencies. Requires listing of endangered or threatened species by FGC to be based solely upon the best available scientific information. Allows a petition to result in a species being designated a different status than what the petition was filed for originally. Exempts a change in species status from the Administrative Procedures Act and adds flexibility to private landowners by adding a voluntary program for declining and vulnerable species. Makes the five-year status review of listed species contingent upon available funding. Revises the ability of FGC to authorize the taking of any candidate species or the taking of any fish that is listed as an endangered, threatened, or candidate species provided that the take is based on the best available scientific information. Allows DFW, relying on the best available scientific information, to make a recommendation to FGC that it authorize or not authorize the taking, as specified.

- *SB 1017 (Allen) Commercial fishing: drift gill net shark and swordfish fishery (2017-2018) Drift Gillnets.*

Status: Approved by the Governor and chaptered on 9/27/2018. Summary: Would require DFW by March 31, 2020, to establish a voluntary permit transition program that includes specified conditions, including a condition that a permittee who voluntarily surrenders his or her drift gill net shark and swordfish permit (DGN permit) and shark or

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swordfish gill net or nets receive, to the extent that funds for the transition program are available, a specified payment, as prescribed.

- *SB 1309 (McGuire) Fishing: Fisheries omnibus bill of 2018.*

Status: Approved by the Governor and chaptered on 9/30/2018. Summary: (1) Makes Salmon Stamp revisions. (2) Permits taking of anchovies in Humboldt Bay between May 1 and Dec 1 without restrictions on area or use, with a 60-ton limit on the total per year. Would delete provisions regarding inspection and notification of bait operations. (3) Authorizes the director, on an emergency basis, to close Dungeness crab season in any waters due to whale entanglements or reopen season in those waters if the risk of whale entanglements has abated. (4) Repeals limitations on conditions for transfer of California halibut bottom trawl vessel permits and authorizes DFW, rather than FGC, to consider a request to transfer a California halibut trawl vessel permit to another vessel, as provided. (5) Designates two additional areas of ocean waters as California halibut trawl grounds, one in Monterey Bay, and one offshore of Port San Luis that would remain closed to trawling until FGC determines that trawling in those areas is consistent with provisions, as provided. If opened, trawl gear may only be deployed in those areas between sunrise and sunset. (6) Requires DFW to implement regulations requiring all traps and buoys to include standardized gear marking and clear identification of ownership.

### ***Federal Regulatory Notices***

On Jul 25, 2018, the U.S. Fish and Wildlife Service (USFWS) and NOAA's National Marine Fisheries Service (NMFS) published three proposed rules to change regulations interpreting and implementing the federal Endangered Species Act (ESA). Each rule affects an important aspect of how USFWS and NMFS manage their responsibilities under the ESA and how other federal agencies comply with the ESA.

At its Aug 22-23, 2018 meeting, FGC authorized its executive director to work with President Sklar and Vice President Williams to incorporate key themes into a comment letter from FGC to Secretary Zinke and Secretary Ross regarding the proposed federal regulatory changes; ultimately, a joint letter was sent from FGC and DFW (Exhibit 2).

In addition, on Sep 24, 2018, the attorney's general of ten states submitted a joint comment letter to Secretary Zinke and Secretary Ross, identifying a number of "troubling" defects in the proposed rules and urging both agencies to withdraw the proposals (Exhibit 3).

### **Significant Public Comments (N/A)**

### **Recommendation (N/A)**

### **Exhibits**

1. DFW legislative update, dated Oct 1, 2018
2. Joint letter from FGC and DFW to Secretary Ryan Zinke and Secretary Wilbur Ross, dated Sep 24, 2018

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3. Comments of the attorneys general of Massachusetts, California, Maryland, New York, Oregon, Pennsylvania, Rhode Island, Vermont, Washington and the District of Columbia, dated Sep 24, 2018

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**4. TRIBAL COMMITTEE (TC)****Today's Item**Information ☐Action ☒

Receive summary from the Oct 16, 2018 TC meeting and potentially adopt TC recommendations. Receive update on TC work plan and draft timeline. Discuss and consider approving new topics for TC review.

**Summary of Previous/Future Actions**

- Most recent TC meeting Oct 16, 2018; Fresno
- **Today consider TC recommendations and potential new topics for TC review** **Oct 17, 2018; Fresno**
- Next TC meeting Feb 5, 2019; Redding

**Background*****TC Workplan and Draft Timeline***

TC works under FGC direction to set and accomplish its work plan (Exhibit 1).

The agenda for the Oct 16 TC meeting (Exhibit 2) included four substantive items:

1. Staff and other committee updates
  - a. Marine advisor for MRC
  - b. Wildlife advisor for WRC
2. DFW updates
3. TC operational framework
4. Co-management vision statement  
 Feb 2018 draft version: *The vision of tribes, the California Fish and Game Commission and the California Department of Fish and Wildlife is to engage in a collaborative effort between sovereigns to achieve mutually agreed upon and compatible management objectives to ensure the health and sustainable use of fish and wildlife.*

During this agenda item, a verbal report will be provided on discussions from the Oct 16 TC meeting and any resulting recommendations.

***New TC Topics***

No new topics are proposed by staff at this time.

**Significant Public Comments (N/A)****Recommendation**

Recommendations developed on Oct 16 will be presented verbally to FGC.



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**Exhibits**

1. TC workplan, updated Oct 2018
2. Agenda for Oct 16, 2018 TC meeting

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission approves the \_\_\_\_\_ recommendations from the October 16, 2018 Tribal Committee meeting.

**OR**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission approves the \_\_\_\_\_ recommendations from the October 16, 2018 Tribal Committee meeting and schedules potential action on the co-management vision statement for the \_\_\_\_\_ Commission meeting.

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**5. MARINE RESOURCES COMMITTEE (MRC)****Today's Item****Information** ☐**Action** ☒

Discuss and consider approving draft agenda topics for the next MRC meeting. Consider approving new topics for MRC to address at a future meeting.

**Summary of Previous/Future Actions**

- |   |                                 |
|---|---------------------------------|
| • Most recent MRC meeting                                 | Jul 17, 2018; MRC, San Clemente |
| • <b>Today consider approving draft MRC agenda topics</b> | <b>Oct 17, 2018; Fresno</b>     |
| • Next MRC meeting  | Nov 14, 2018; MRC, Sacramento   |

**Background*****MRC Work Plan and Draft Timeline***

FGC directs the work of MRC. The updated work plan in Exhibit 1 includes topics and draft timelines for items referred by FGC to MRC. Draft agenda topics proposed for the Nov 2018 MRC meeting, shown in the "Nov" column of the work plan, include the following management plan, regulations, and special project topics for FGC review and consideration today:

- MLMA Master Plan for fisheries – implementation updates
- Coastal fishing communities update
- Aquaculture lease best management practices (BMPs) update and possible recommendation
- Aquaculture Programmatic Environmental Impact Report (added at Apr FGC meeting)
- Lobster Advisory Committee stakeholder lessons learned report – informational presentation on report by Heal the Bay (added per public request at Aug FGC meeting)

***New MRC Topics***

No new topics have been identified at this time.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Approve draft agenda topics for the Nov MRC meeting as proposed.

**Exhibits**

1. MRC work plan, dated Oct 1, 2018

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission approves the draft agenda topics for the November 2018 Marine Resources Committee meeting.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**6. RECREATIONAL TAKE OF PURPLE SEA URCHIN (REGULAR RULEMAKING)****Today's Item**Information ☐Action ☒

Consider authorizing publication of notice of intent to add Section 29.06 for the recreational take of purple sea urchin.

**Summary of Previous/Future Actions**

- |                                 |                              |
|---------------------------------|------------------------------|
| • MRC vetting                   | Mar 6, 2018; MRC, Santa Rosa |
| • Adopted emergency regulations | Apr 18-19, 2018; Ventura     |
| • <b>Today's notice hearing</b> | <b>Oct 17, 2018; Fresno</b>  |
| • Discussion hearing            | Dec 12-13, 2018; Oceanside   |
| • Adoption hearing              | Feb 6-7, 2019; Redding       |

**Background**

On Apr 18, 2018, FGC took emergency action to increase the recreational take limit of purple sea urchin to 20 gallons per day in Sonoma and Mendocino counties, to address the population growth's severe negative impact to bull kelp forests and red abalone (see agenda item 18, this meeting).

Following the emergency action, DFW has not observed any significant improvement to bull kelp and red abalone, and reports that northern California kelp forests continue to decline. Because of severe ecosystem decline, the maximum duration of the emergency regulation is insufficient to ensure that DFW and stakeholders can conduct adequate research to inform management decisions, necessitating this regular rulemaking.

The proposed regulation would add a new section (29.06), and modify the provisions of the emergency regulation in three ways:

1. Increase the daily recreational take limit to 40 gallons;
2. Apply the take allowance to waters off Humboldt County in addition to Sonoma and Mendocino counties; and
3. Include an option to extend the take allowance to waters off Del Norte County.

Based on information collected from recreational harvesting efforts in 2018, doubling the bag limit from the emergency regulation is not expected to affect the long-term sustainability of the purple sea urchin population and is expected to create more lasting benefits to the northern California kelp forest ecosystem. DFW recommends extending the coverage of the higher recreational take limit to Humboldt County to support bull kelp beds in three counties.

Finally, the regulation would maintain a developing recreational interest in purple sea urchin and help reduce the effects of an overpopulated species to a vulnerable ecosystem.

**Significant Public Comments (N/A)**

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**Recommendation**

**FGC staff:** Authorize publication of the notice as recommended by DFW.

**DFW:** Authorize publication of the notice as proposed.

**Exhibits**

1. DFW memo, received Oct 4, 2018

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission authorizes publication of a notice of its intent to add Section 29.06 related to the recreational take of purple sea urchin as proposed, including an option to include Del Norte County.

**OR**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission authorizes publication of a notice of its intent to add Section 29.06 related to the recreational take of purple sea urchin as proposed, without an option to include Del Norte County.

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**7. INCIDENTAL TAKE ALLOWANCES FOR CRABS****Today's Item****Information** ☐**Action** ☒

Consider adopting proposed regulations for incidental take allowances for crabs other than the genus *Cancer*.

**Summary of Previous/Future Actions**

- Notice hearing Jun 20-21, 2018; Sacramento
- **Today's adoption hearing** **Oct 17, 2018; Fresno**

**Background**

In recent years, DFW has documented increased landings of species of non-Cancer crab, or crabs not in the genus *Cancer* (including brown box crab and California king crab), with an all-time high in 2016. Under current laws, incidental take of non-Cancer crabs is permitted in the target trap fisheries for rock crab, Dungeness crab, and lobster, with no limit on amount. In Apr 2018, DFW determined that the harvest of non-Cancer crabs is an emerging fishery and, under the Marine Life Management Act, DFW must recommend management measures for FGC's consideration to ensure sustainability (Exhibit 1).

***Proposed Regulations***

The proposed changes, as reflected in exhibits 2 and 3, are:

- Existing regulations in Section 126, governing the commercial harvest of Tanner crab, another non-Cancer crab, would be moved to Section 126.1. New Section 126 would govern the commercial take of non-Cancer crabs in trap gear and would define Cancer crabs, create landing limits for non-Cancer crabs taken incidental to other targeted species in trap gear, and require all crabs to be landed prior to use as bait.
- Possession and landing limits for species in the Lithodidae family (box and king crabs) would be set to no more than 25 pounds per species per day. The proposed limits for box and California king crab are designed to slow current harvest rates while research is conducted on these species, and to allow development of an experimental gear permit for box crab to investigate the potential for a targeted fishery (see Agenda Item 12, this meeting).
- Sheep crab would be subject to a total allowable catch (TAC) of 95,000 pounds annually (Exhibit 3). The proposed TAC is intended to maintain the current harvest level while preventing incidental harvest levels from increasing, possibly to unsustainable levels.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Adopt the regulations as recommended by DFW.

**DFW:** Adopt the regulations as proposed.

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**Exhibits**

1. DFW memo designating non-Cancer crab as emerging fishery, received Apr 6, 2018
2. DFW memo, received Jun 8, 2018
3. Initial statement of reasons
4. Draft notice of exemption
5. DFW presentation

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts proposed changes to subsection 125.1(c)(3) and Section 126, and adds Section 126.1, related to incidental take allowances for crabs not in the genus *Cancer*, and that the Commission has determined, based on the record, that this approval is exempt from the California Environmental Quality Act pursuant to the guidelines in Title 14 Sections 15307 and 15308.

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**8. GROUND FISH****Today's Item****Information** ☒**Action** ☐

Discuss proposed changes to amend recreational and commercial fishing regulations for federal groundfish and associated species for consistency with federal rules for 2019 and 2020.

**Summary of Previous/Future Actions**

- |                                     |                             |
|-------------------------------------|-----------------------------|
| • Notice hearing                    | Aug 22-23, 2018; Fortuna    |
| • <b>Today's discussion hearing</b> | <b>Oct 17, 2018; Fresno</b> |
| • Adoption hearing                  | Dec 12-13, 2018; Oceanside  |

**Background**

On Jun 12, 2018, the Pacific Fishery Management Council recommended changes to federal rules for annual catch limits and recreational groundfish fishing in California for 2019 and 2020, which are expected to go into effect on or around Jan 1, 2019. DFW is proposing regulatory changes that would make regulations for state waters consistent with the new federal regulations.

*Proposed Amendments*

1. Increase allowable depths and season lengths for specific recreational fisheries in identified management and conservation areas.
2. Increase or decrease the recreational bag limit for specific fisheries in identified areas.
3. Increase commercial trip limits for cabezon and greenling.

See Exhibit 2 for details of the proposed changes.

**Significant Public Comments (N/A)****Recommendation (N/A)****Exhibits**

1. DFW memo, received Jul 30, 2018
2. Initial statement of reasons
3. DFW presentation

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**9. RECREATIONAL TAKE OF RED ABALONE****Today's Item****Information** ☒**Action** ☐

Discuss proposed changes to extend the fishery closure sunset date for the recreational red abalone fishery for another two years, until Apr 1, 2021.

**Summary of Previous/Future Actions**

- |                                     |                             |
|-------------------------------------|-----------------------------|
| • Notice hearing                    | Aug 22-23, 2018; Fortuna    |
| • <b>Today's discussion hearing</b> | <b>Oct 17, 2018; Fresno</b> |
| • Adoption hearing                  | Dec 12-13, 2018; Oceanside  |

**Background**

See Exhibit 3 for additional background information.

***Proposed Amendment***

DFW proposes to extend the closure of the abalone fishery beyond the current Apr 1, 2019 sunset date, for another two years, until Apr 1, 2021. Effective dates for take and possession would be updated in the regulations as well to reflect the proposed change.

DFW's proposal allows for consideration of reopening the fishery prior to reaching full recovery (i.e., reopening the fishery before density standards are fully realized under the Abalone Recovery and Management Plan (ARMP) or a red abalone fishery management plan (FMP) upon adoption by FGC). DFW recommends, however, considering the management triggers in the ARMP or a red abalone FMP, once adopted by FGC, to determine whether reopening the fishery to recreational harvest is warranted. The proposed regulation change is necessary to facilitate recovery of the red abalone population while preparation of the red abalone FMP is underway.

A draft notice of exemption (Exhibit 4) gives FGC notice of DFW's recommendation to rely on a California Environmental Quality Act categorical exemption for this regulation change.

**Significant Public Comments**

1. Two commenters are opposed to DFW's proposal to extend the closure of the abalone fishery beyond the current Apr 1, 2019 sunset date.
2. A diver who has harvested abalone since 1974, expresses concern that closing the abalone fishery is not the solution and suggests promoting sea urchin abatement (Exhibit 5).

**Recommendation (N/A)****Exhibits**

1. DFW memo, received Jul 30, 2018
2. Initial statement of reasons



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3. Staff summary from Aug 22-23, 2018 meeting, Agenda Item 12
4. Draft notice of exemption
5. Email from Curtis Carley, received Aug 23, 2018

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**10. STATEWIDE MARINE PROTECTED AREA (MPA) MONITORING ACTION PLAN****Today's Item**Information ☐Action ☒

Consider adopting the statewide MPA monitoring action plan.

**Summary of Previous/Future Actions**

- |  |                                 |
|--|---------------------------------|
| • MRC received overview of action plan       | Jul 17, 2018; MRC, San Clemente |
| • Received draft action plan                 | Aug 22-23, 2018; Fortuna        |
| • <b>Today consider adopting action plan</b> | <b>Oct 17, 2018; Fresno</b>     |

**Background**

The Marine Life Protection Act (MLPA) requires provisions for “monitoring, research, and evaluation at selected sites to facilitate adaptive management of MPAs and ensure that the [MPA] system meets the goals” (sections 2853(c)(3) and 2856(a)(2)(H), California Fish and Game Code). FGC adopted guidance for monitoring, research and evaluation in the 2008 master plan for MPAs, which emphasized a regional scale for baseline monitoring efforts and monitoring plans for each of four planning regions. The 2016 final master plan, adopted by FGC in Aug 2016, recognizes that a statewide-level MPA network monitoring plan would be biologically appropriate and consistent with the MLPA goal to manage MPAs as a network moving forward.

To achieve the goal of a statewide-level MPA network monitoring plan, DFW collaborated with the California Ocean Protection Council and academic partners. The resulting “Marine Protected Area Monitoring Action Plan” ties together work to date; incorporates novel, quantitative and expert-informed scientific approaches; and offers prioritization of metrics, habitats, sites, and species to target for long-term monitoring and evaluation of California’s MPA network.

In Jul 2018, DFW presented MRC an overview of the action plan purpose and scope. In Aug 2018, DFW presented the draft action plan to FGC and the process for peer review and public comment (held Jul-Aug). Since then, DFW has integrated peer review and public feedback into a revised action plan for FGC consideration today. Included as exhibits are a DFW synopsis of the process, including tribal engagement (Exhibit 1); a revised action plan (Exhibit 2); and eight appendices to the action plan (Exhibit 3).

DFW has provided summaries of peer review recommendations with DFW responses (Exhibit 4) and public comments with DFW responses (Exhibit 5). Today, DFW will highlight changes made to the action plan proposed for approval today (Exhibit 6).

**Significant Public Comments**

See Exhibit 5 for a summary of public comments received.

**Recommendation**

**FGC staff:** Adopt the revised 2018 action plan as recommended by DFW.

**DFW:** Adopt the revised 2018 action plan as presented.

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**Exhibits**

1. DFW memo, received Oct 8, 2018
2. Revised 2018 MPA monitoring action plan, dated 2018
3. Appendices to MPA monitoring action plan
4. Summary of peer review comments and DFW responses, received Oct 8, 2018
5. Summary of public comments and DFW responses, received Oct 8, 2018
6. DFW presentation

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the “2018 Marine Protected Area Monitoring Action Plan” as presented today.

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**11. RED ABALONE FISHERY MANAGEMENT PLAN****Today's Item****Information** ☒**Action** ☐

Receive peer review results for draft red abalone fishery management plan (FMP), discuss peer review results, and discuss next steps.

**Summary of Previous/Future Actions**

- |   |                             |
|---|-----------------------------|
| • FGC supports red abalone FMP development per MRC recommendation | Oct 8, 2014; Mt. Shasta     |
| • DFW updates to MRC on FMP process and timeline                  | 2015-2017; MRC meetings     |
| • Received update on FMP process                                  | Dec 6-7, 2017; San Diego    |
| • Discussed FMP scope and content                                 | Apr 18-19, 2018; Ventura    |
| • Last update on FMP schedule                                     | Aug 22-23, 2018; Fortuna    |
| • <b>Today receive peer review results for draft FMP</b>          | <b>Oct 17, 2018; Fresno</b> |

**Background**

DFW is developing a red abalone FMP for adoption by FGC. Beginning in 2014, DFW provided updates at MRC meetings on the FMP process, progress, and stakeholder input. DFW abalone project staff have also kept FGC and MRC updated on the unprecedented environmental conditions on the north coast and subsequent biological impacts to abalone, and how those are affecting the FMP process and possible provisions.

At FGC's Dec 2017 meeting, DFW provided an overview of its proposed harvest control rule (HCR) for the FMP. In addition, an alternate HCR option was proposed by The Nature Conservancy using survey methods derived from engaging abalone fishermen in citizen science. FGC supported advancing the stakeholder-proposed HCR through a peer review process alongside the DFW-proposed HCR. In addition, FGC directed staff to schedule future FMP updates at FGC meetings rather than MRC meetings due to broad interest in the topic.

In Apr 2018, DFW provided a more detailed overview of the red abalone FMP components, including the management framework, new environmental and abalone condition factors, management responses, a reopening approach, and the DFW HCR-based management strategy. In Jun 2018, the California Ocean Science Trust (OST), with support from the California Ocean Protection Council, began coordinating an external, independent scientific peer review of the draft FMP and both the DFW-developed and The Nature Conservancy's stakeholder-developed HCR-based management strategies. At the Jun 2018 FGC meeting, DFW notified FGC that an extended timeline was necessary to provide time for adequate peer review of both strategies.

On Aug 20, 2018, OST hosted an initial public webinar with the peer review panel, DFW, and The Nature Conservancy. A second public webinar is scheduled to be held on Oct 12, 2018 following release of the peer review report (Exhibit 1).

Today, OST will present the peer review results on the draft red abalone FMP.

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**Significant Public Comments (N/A)**

**Recommendation**

**FGC staff:** Request that DFW analyze the peer review results, consider possible pathways and timeline for completing the FMP, and schedule follow-up discussion for the Dec 12-13, 2018 FGC meeting.

**Exhibits**

1. OST red abalone FMP peer review report, dated Oct 2018

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**12. BOX CRAB EXPERIMENTAL GEAR PERMIT****Today's Item****Information** ☒**Action** ☐

Receive and discuss proposed box crab experimental gear permit (EGP) program, participation criteria, and permit conditions.

**Summary of Previous/Future Actions**

- |  |                                 |
|--|---------------------------------|
| • MRC discussed box and king crab landings increase                          | Nov 9, 2017; MRC, Marina        |
| • FGC approved MRC recommendation for incidental take limits and EGP program | Dec 6-7, 2017; San Diego        |
| • Notice hearing for incidental take limits                                  | Jun 20-21, 2018; Sacramento     |
| • MRC update on EGP program  | Jul 17, 2018; MRC, San Clemente |
| • <b>Today's proposed EGP criteria and conditions</b>                        | <b>Oct 17, 2018; Fresno</b>     |
| • Consider approving EGP applications  | Dec 12-13, 2018; Oceanside      |

**Background**

In 2017, DFW notified FGC of a rapid increase in landings of box crab and California king crab from different gear types in response to developing market demands. While California Fish and Game Code Section 8284 specifically authorizes incidental take of several marine invertebrates incidental to other target fisheries—such as in the rock crab trap fishery, where incidental take of Kellet's whelk, octopus, and crabs other than of the genus *Cancer* is allowed—no limit on the amount of take is specified.

In addition, several fishermen contacted FGC with requests to authorize targeting the species authorized in Section 8284, either through a regulation change or through an experimental fishery via EGPs. However, little biological information is available about the species or sustainable harvest levels. In Aug 2017, FGC referred the requests to DFW and MRC for review.

Based on presentations and discussion at the Nov 2017 MRC meeting, MRC recommended, and FGC approved, a two-pronged approach in response to the biological concerns and industry interest: setting incidental take limits and developing research plans. The first part, which establishes conservative incidental take commercial trip limits for *Lithodidate* crabs (including box crab and California king crab) and for all other non-*Cancer* crab species (except Tanner crab), is being accomplished through a rulemaking scheduled for adoption at this meeting (see Agenda Item 7). For future research, DFW has been developing an EGP-based collaborative research program to be conducted with commercial trap fishermen willing to meet conditions necessary for the project. DFW has held two meetings with interested industry members to share ideas and get feedback: in May to introduce general project and research design, and in Sep to clarify participation criteria, potential catch allocations, and cost-sharing, including participant contribution. DFW has sought funding sources to offset costs of electronic monitoring equipment and participation in the program.

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Today, DFW will present an update on the research design, proposed number of EGP participants, EGP participation criteria and permit conditions, and costs (Exhibit 1). Following this meeting, commercial trappers interested in a box crab EGP under defined conditions and cost are asked to submit requests to FGC. DFW, including its Law Enforcement Division, will review the requests and provide recommendations for FGC approval of EGPs in Dec.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Supports DFW recommendation.

**DFW:** Provide any feedback on the criteria and/or fee for participation in the EGP program, and set a deadline of Nov 1 for interested fishermen to submit an EGP request to FGC, which would provide sufficient time for review by DFW enforcement prior to the Dec FGC meeting.

**Exhibits**

1. DFW presentation

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**13. MARINE NON-REGULATORY REQUESTS****Today's Item****Information** ☐**Action** ☒

This is a standing agenda item for FGC to act on non-regulatory requests from the public that are marine in nature. For this meeting:

- (A) Consider action on non-regulatory requests received at the Aug 2018 meeting
- (B) Consider action on pending non-regulatory requests referred to staff or DFW for review

**Summary of Previous/Future Actions**

(A)

- FGC received requests Aug, 22-23, 2018; Fortuna
- **Today's action on requests** **Oct 17, 2018; Fresno**

(B)

**N/A****Background**

FGC provides direction regarding requests from the public received by mail and email and during public forum at the previous FGC meeting. Public requests for non-regulatory action follow a two-meeting cycle to ensure proper review and consideration.

- (A) **Non-regulatory requests.** Non-regulatory requests scheduled for consideration today were received at the Aug 2018 meeting in one of three ways: (1) submitted by the comment deadline and published as tables in the meeting binder, (2) submitted by the late comment deadline and delivered at the meeting, or (3) received during public comment.

Today, four non-regulatory requests received at the Aug 2018 meeting are scheduled for action:

- I. Potential abalone/urchin impacts resulting from proposed expansion of Wheeler North Reef
- II. North coast market squid research proposal
- III. Review regulations and policies for harvesting giant keyhole limpets
- IV. Separate FGC into two bodies (marine and wildlife)

Exhibit A1 summarizes and contains staff recommendations for each request; individual written requests are in exhibits A2-A4.

- (B) **Pending non-regulatory requests.** This item is an opportunity for staff to provide a recommendation on non-regulatory requests that were scheduled for action at a previous meeting and referred by FGC to staff or DFW for further review.

No items are scheduled for action today.



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**Significant Public Comments (N/A)**

**Recommendation**

(A) Adopt staff recommendations for Aug 2018 non-regulatory requests (Exhibit A1).

**Exhibits**

- A1. List of marine non-regulatory requests and staff recommendations for requests received through Aug 23, 2018
- A2. Email and attachments from Jeff Crumley, received Jul 16, 2018
- A3. Email and proposal from Ken Bates, received Jul 24, 2018
- A4. Letter from Frank Oakes, Steller Biotechnologies, received Aug 6, 2018

**Motion/Direction**

(A) Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the staff recommendation for actions on August 2018 non-regulatory requests.

**OR**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the staff recommendations for actions on August 2018 non-regulatory requests, except for item(s) \_\_\_\_\_ for which the action is \_\_\_\_\_.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**14. MARINE AND WILDLIFE/INLAND FISHERIES PETITIONS FOR REGULATION CHANGE****Today's Item****Information** ☐**Action** ☒

This is a standing agenda item for FGC to act on regulation petitions from the public that are related to marine and wildlife/inland fisheries issues. For this meeting:

- (A) Action on the petition for regulation change received at the Aug 2018 meeting
- (B) Pending regulation petitions referred to FGC staff and DFW for review

**Summary of Previous/Future Actions**

(A)

- Receipt of new petitions Aug 22-23, 2018; Fortuna
- **Today's action on petitions** **Oct 17, 2018; Fresno**

(B)

- FGC granted petition #2015-014 Apr 13-14, 2016; Santa Rosa
- WRC discussion and recommendation May 24, 2017; WRC, Sacramento
- FGC referred petitions to DFW Jun 21-22, 2017; Smith River
- WRC discussion Jan 11, 2018; WRC, Santa Rosa
- WRC discussion and recommendation Sep 20, 2018; WRC, Sacramento
- **Today's discussion and possible action** **Oct 17, 2018; Fresno**

**Background**

As of Oct 1, 2015, any request for FGC to adopt, amend, or repeal a regulation must be submitted on form FGC 1, "Petition to the California Fish and Game Commission for Regulation Change" (Section 662, Title 14). Petitions received at an FGC meeting are scheduled for consideration at the next business meeting, unless the petition is rejected under 10-day staff review as prescribed in subsection 662(b). A petition may be (1) denied, (2) granted, or (3) referred to committee, staff or DFW for further evaluation or information-gathering.

- (A) **Petition for regulation change.** One marine regulation petition from Aug 2018 is scheduled for action today:

- I. *Petition #2018-010 AM 1: Convert non-transferable commercial nearshore permits to transferable permits*

A staff recommendations and rationale are provided below.

- (B) **Pending regulation petitions.** This item is an opportunity for staff to provide a recommendation on petitions previously referred by FGC to staff, DFW, or committee for review. DFW and WRC have completed their reviews and prepared recommendations for two petitions:

- I. *Petition #2015-014: Mendocino, Sonoma and Marin counties' coastal streams (exhibits B1-B2).*

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II. *Petition #2015-015: Russian River fishing regulations and minimum flow requirements* (exhibits B3-B4).

For a detailed overview of the process used to consider the petitions, see Exhibit B5. Staff recommendations are provided below.

**Significant Public Comments (N/A)****Recommendation**

- (A) **FGC staff:** Adopt DFW recommendation to deny the petition.

**DFW:** Deny petition #2018-010 AM-1. Price per pound was used as a basis to determine qualification for transferable versus non-transferable permits. Any review or changes to the nearshore restricted access program should include all aspects of the program and be informed by FGC's review of its Restricted Access Policy.

- (B) **FGC staff:** Adopt DFW recommendation to deny the petitions.

**WRC:** Deny petitions, as recommended by DFW and FGC staff.

**DFW:** Deny petitions #2015-014 and #2018-15. The proposed regulation changes conflict with state and federal fisheries management objectives and would undo recovery actions listed in National Marine Fisheries Service species recovery plans, as reflected in exhibits B2 and B4.

**Exhibits**

- A1. Petition #2018-010 AM 1: Convert non-transferable commercial nearshore permits to transferable permits, received Jul 25, 2018.
- B1. Petition #2015-014: Mendocino, Sonoma and Marin counties' coastal streams, received Dec 15, 2015
- B2. DFW memo with attachments regarding Petition #2015-014, received Sep 7, 2018
- B3. Petition #2015-015: Russian River fishing regulations and minimum flow requirements, received Dec 16, 2015
- B4. DFW memo with attachments regarding Petition #2015-015, received Sep 7, 2018
- B5. Staff summary from Sep 20, 2018 WRC meeting (for background purposes only)

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the staff recommendation to deny petitions for regulation change #2018-010, #2015-014, and #2015-015.

**OR**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the following actions for petitions for regulation change:

#2018-010: \_\_\_\_\_, #2015-014: \_\_\_\_\_, and #2015-015 \_\_\_\_\_.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**15. DEPARTMENT INFORMATIONAL ITEMS****Today's Item****Information** ☒**Action** ☐

This is a standing agenda item to receive and discuss informational updates from DFW:

- (A) Director's report
- (B) Law Enforcement Division
- (C) Wildlife and Fisheries Division, and Ecosystem Conservation Division
- (D) Marine Region

**Summary of Previous/Future Actions (N/A)****Background**

Verbal reports are expected at the meeting for items (A) through (D).

- (A) On Sep 7, 2018, the governor released the California Biodiversity Initiative Action Plan (Exhibit 1) and signed an executive order (B-54-18, Exhibit 2) outlining steps to safeguard California's unique ecosystems from climate change threats. The executive order calls on the secretary of food and agriculture and the secretary of natural resources to achieve three goals: promote deeper understanding of threats to California's biodiversity, manage and restore natural and working lands and waterways, and explore appropriate financing options to achieve these goals. The action plan includes recommendations related to improved habitat, migration corridors, and connectivity; it also notes that Caltrans and DFW are working together to update the statewide assessment of essential habitat connectivity.
- (D) The Marine Region report will include an update on recent federal fishery disaster determinations for salmon and sardine made by U.S. Secretary of Commerce Wilbur Ross on Sep 25, 2018 (Exhibit 3), which make the fisheries eligible for National Marine Fisheries Service disaster assistance. While \$20 million in assistance was appropriated this year, those monies are for *all* fishery disasters; the West Coast had over a dozen declarations alone (Exhibit 4).

**Significant Public Comments (N/A)****Recommendation (N/A)****Exhibits**

1. *California Biodiversity Initiative: A Roadmap for Protecting the State's Natural Heritage*, dated Sep 2018
2. Executive Order B-54-18, dated Sep 7, 2018
3. NOAA Fisheries news release, *U.S. Secretary of Commerce Declares Commercial Fishery Disasters for West Coast Salmon and Sardines*, dated Sep 25, 2018

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4. Email from Linda Belton, National Oceanic and Atmospheric Administration, listing Washington, Oregon and California requests for fishery disaster determinations, received Sep 25, 2018

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**16. STRATEGIC PLANNING****Today's Item****Information** ☐**Action** ☒

This is a standing agenda item for 2018-19 FGC meetings as FGC develops a new strategic plan. Today is focused on the potential mission statement, vision statement and core values.

**Summary of Previous/Future Actions**

- |   |                                |
|---|--------------------------------|
| • First FGC strategic planning meeting  | Feb 22, 2018; Sacramento       |
| • Discussion of mission, vision, core values  | Jun 20-21, 2018; Sacramento    |
| • Discussion of draft potential mission, vision and core values                       | Aug 22-23, 2018; Fortuna       |
| • <b>Today's discussion and potential adoption of mission, vision and core values</b> | <b>Oct 17-18, 2018; Fresno</b> |
| • Next strategic planning discussion  | Dec 12-13, 2018; Oceanside     |

**Background**

FGC created its current strategic plan in 1998, which includes a mission statement and a vision statement. Over the ensuing 20 years, much has changed, not the least of which is a commission with broader authorities and a more ecosystem-based approach to addressing fish and wildlife issues. With the upcoming 150-year anniversary of FGC, the time is right to reassess its mission and vision statements, and to potentially adopt a set of core values.

Today's meeting marks the third focused on potential changes to FGC's mission and vision (Exhibit 1) and a potential statement of core values. In Jun 2018, FGC held its initial discussion and in Aug 2018 held a discussion with stakeholders in a "workshop" format using a set of draft core values, mission statement and vision statement prepared with FGC, public and staff input. After the Aug meeting, staff incorporated additional ideas and comments from the workshop into a new set of draft documents (Exhibit 2) that were then made available for public comment; nearly a dozen comments were received by Oct 4.

As we near the end of this phase of the strategic planning process, staff is seeking the assistance of a contractor with strategic planning expertise, in part to help ensure that the process stays on track for a complete and valuable product by FGC's 150-year anniversary. With FGC's consent, staff will seek outside funding for a contractor.

**Significant Public Comments**

A wide variety of comments were received on the core values, mission and vision, some extensive and detailed, and others only tangentially related to the request for comments; the contrast ranged from praise for FGC's "ambitious" effort and being "more inclusive of the needs and interests of the broader California public," to disappointment that the documents did not "include specific support of hunting and fishing activities" and an admonition for creating "milquetoast nothingness" and a "bland recital of aspirations...divorced from the actual work of the Commission."

## STAFF SUMMARY FOR OCTOBER 17, 2018

Staff has summarized the main elements of the public comments, and detailed the specific proposed changes, in Exhibit 3. The summary does not include *all* comments submitted by each commenter, but focuses mostly on those comments with specific suggestions or that provide rationale for proposed changes.

Comments were received from over 20 hunting and fishing conservation organizations (Exhibit 4), a half dozen non-governmental environmental organizations (exhibits 5-8), the Port of San Diego (Exhibit 9), a commercial fisherman (Exhibit 10), and several members of the public (Exhibit 11). Given the degree of discordant comments and suggestions for changes, staff is seeking additional guidance from FGC on the types of changes to incorporate into the core values, vision statement and mission statement.

### Recommendation

**FGC staff:** Given the degree of discordant comments and suggestions for changes, provide staff with direction on potential changes to the draft core values, and mission and vision statements for potential adoption at the Dec 12-13, 2018 FGC meeting.

### Exhibits

1. Current FGC mission and vision statements, adopted in 1998
2. Draft potential core values, mission statement and vision statement, dated September 23, 2018
3. Summary table of public comments and proposed changes, dated Oct 5, 2018
4. Email from the American Sportfishing Association and 20 other hunting and fishing conservation organizations, received Oct 4, 2018
5. Email letter from Camilla Fox and John Hadidian, Project Coyote, received Oct 2, 2018
6. Email from Jean Su, Center for Biological Diversity, received Oct 4, 2018
7. Email from Amber Shelton, Environmental Protection Information Center, received Oct 4, 2018
8. Email from Marilyn Jasper on behalf of Public Interest Coalition, Sierra Club Placer Group, and Humane Society of the Sierra Foothills, received Oct 4, 2018
9. Email from Jason Giffen, Port of San Diego, received Oct 4, 2018
10. Email from Bob Bertelli, received Oct 4, 2018
11. Emails from Mary Mote, Art Seavey, Don Thompson, David Orong and Kris Nikolauson, received Sep 24-28, 2018

### Motion/Direction

Provide staff with direction on additional changes to the core values and mission and vision statements for potential adoption in December 2018.

**OR**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the core values, a revised vision statement, and a revised mission statement as discussed today.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**17. CALIFORNIA SHEEPHEAD (CONSENT)****Today's Item**Information ☐Action ☒

Consider authorizing publication of notice of intent to amend regulations concerning the filleting of California sheephead on vessels at sea.

**Summary of Previous/Future Actions**

- |                                 |                             |
|---------------------------------|-----------------------------|
| • <b>Today's notice hearing</b> | <b>Oct 17, 2018; Fresno</b> |
| • Discussion hearing            | Dec 12-13, 2018; Oceanside  |
| • Adoption hearing              | Feb 6-7, 2019; Redding      |

**Background**

Section 27.65 defines fillet; lists the fillet requirements for, and specifies, those fish that may be filleted on a boat or brought ashore as fillets; and prohibits the filleting, steaking, or chunking of any species with a size limit unless a fillet size is otherwise specified. Almost all finfishes with a recreational minimum size limit also have a corresponding fillet length specified in Section 27.65.

Recreational anglers and the sport fishing industry, including the Sportfishing Association of California, have been requesting a fillet length regulation permitting California sheephead to be filleted at sea since a minimum size limit was implemented in 2001.

The proposed regulation will amend Section 27.65 to add California sheephead to the list of fish that may be filleted and will specify that fillets must be a minimum of six and three-quarter inches in length and bear the entire skin intact.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Under a motion to adopt the consent calendar, authorize publication of the notice as recommended by DFW.

**DFW:** Authorize publication of the notice as detailed in the draft initial statement of reasons (ISOR; Exhibit 2).

**Exhibits**

1. DFW memo transmitting ISOR, received Oct 10, 2018
2. Draft ISOR
3. Draft economic and fiscal impact statement (Std. 399)
4. DFW memo with California Environmental Quality Act overview, received Oct 10, 2018
5. Draft notice of exemption

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the FGC staff recommendations for items 17-22 on the consent calendar.



## STAFF SUMMARY FOR OCTOBER 17, 2018

**18. RECREATIONAL TAKE OF PURPLE SEA URCHIN (EMERGENCY) (CONSENT)****Today's Item**Information ☐Action ☒

Consider re-adopting emergency purple sea urchin regulations.

**Summary of Previous/Future Actions**

- |  |                              |
|--|------------------------------|
| • MRC vetting                          | Mar 6, 2018; MRC, Santa Rosa |
| • Adoption hearing                     | Apr 18-19, 2018; Ventura     |
| • <b>Today's potential re-adoption</b> | <b>Oct 17, 2018; Fresno</b>  |

**Background**

At its Apr 2018 meeting, FGC adopted emergency regulations to allow increased recreational take of purple sea urchin in an effort to address an unprecedented increase in purple sea urchin populations and subsequent negative impacts to bull kelp forests, a critically important habitat for red abalone. Today's request is to extend the emergency regulation for an additional 90 days to allow more time to evaluate the effects of increased take. In addition, a regular rulemaking, similar in scope to this emergency extension, is under development by DFW (see Agenda Item 6).

Currently, the emergency regulation allows up to 20 gallons of purple sea urchin per person, per day, to be taken (increased from 35 animals) in Mendocino and Sonoma Counties with no possession limit. Since the emergency regulations took effect, recreational divers have conducted a number of urchin removal events in cooperation with DFW in an effort to positively affect kelp recovery on the north coast. However, bull kelp is a relatively slow-growing perennial species, and any restoration attempts will require at least a year to obtain any observable results. This readoption will allow increased recreational take to continue during removal events which are planned for later this fall, and additional time for DFW to track and evaluate the effect on kelp forest ecosystems until a regular rulemaking can be adopted and in effect.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Under a motion to adopt the consent calendar, find that the readoption of the regulation is necessary for the immediate conservation and protection of northern California kelp forests and re-adopt the emergency regulation as reflected in the statement of proposed emergency regulatory action in Exhibit 2.

**DFW:** Re-adopt emergency regulations for an additional 90-day period as the emergency regulations are set to expire on Nov 7, 2018.

**Exhibits**

1. DFW memo, received Oct 2, 2018
2. Statement of proposed emergency regulatory action

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**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the FGC staff recommendations for items 17-22 on the consent calendar.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**19. LASSICS LUPINE AND COAST YELLOW LEPTOSIPHON (CONSENT)****Today's Item****Information** ☐**Action** ☒

Adopt proposed changes to plants of California declared to be endangered, threatened or rare regulations, to add Lassics lupine and coast yellow leptosiphon.

**Summary of Previous/Future Actions**

- Notice hearing Apr 18-19, 2018; Ventura
- **Today's adoption hearing Oct 17, 2018; Fresno**

**Background**

At its Apr 19, 2018 meeting, FGC found that the petitioned actions to list Lassics lupine (*Lupinus constancei*) and coast yellow leptosiphon (*Leptosiphon croceus*) as endangered under the California Endangered Species Act were warranted. At the same meeting, FGC authorized publication of a notice of its intent to amend Section 670.2 regarding plants of California declared to be endangered, threatened or rare; the notice was published in the California Regulatory Notice Register on Aug 31, 2018.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Under a motion to adopt the consent calendar, adopt the proposed regulations as reflected in the initial statement of reasons in Exhibit 2.

**Exhibits**

1. DFW memo, received Aug 21, 2018
2. Initial statement of reasons
3. Economic and fiscal impact statement (Std. 399)

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the FGC staff recommendations for items 17-22 on the consent calendar.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**20. COMMERCIAL USE AND POSSESSION OF NATIVE RATTLESNAKES (CONSENT)****Today's Item**Information ☐Action ☒

Consider comments received on the 15-day notice published on Jun 11, 2018 and consider adopting revised proposed regulations concerning the commercial use and possession of native rattlesnakes for biomedical and therapeutic purposes.

**Summary of Previous/Future Actions**

- |   |                              |
|---|------------------------------|
| • Notice hearing  | Jun 21-22, 2017; Smith River |
| • Adoption hearing  | Oct 11-12, 2017; Atascadero  |
| • 15-day notice of revisions                                    | Jun 11, 2018                 |
| • Office of Administrative Law's disapproval of rulemaking file | Sep 13, 2018                 |
| • <b>Today's adoption hearing</b>                               | <b>Oct 17, 2018; Fresno</b>  |

**Background**

At its Jun 2017 meeting, FGC authorized publication of notice of its intent to add regulations concerning the commercial use and possession of native rattlesnakes for biomedical and therapeutic purposes. In Oct 2017, FGC adopted the regulations as proposed. Staff filed the rulemaking with the Office of Administrative Law (OAL) on Jan 24, 2018.

During its review, OAL identified several deficiencies in the rulemaking which resulted in FGC withdrawing the file on Mar 7, 2018 in order to make corrections to the regulatory language and initial statement of reasons (ISOR).

On Jun 11, 2018, FGC staff sent to interested parties a 15-day notice (Exhibit 1) addressing the issues identified by OAL. FGC received one comment letter (Exhibit 2) on the 15-day notice.

In response to public comment on the 15-day notice, subsection 42(d)(4)(A)3 was revised to clarify that the quantity of venom is not required to be specified in the statement of purpose; and the instructions for the Commercial Native Rattlesnake Application (form DFW 1044) were revised to correct a typographical error, changing "with 30 days" to "within 30 days." In addition, FGC staff, with assistance from DFW, made revisions to authority and reference citations, amended Section 651 for grammatical and consistency purposes, and made an editorial change to form DFW 1044 to identify the acronym "FGC" to mean "Fish and Game Code." The changes and responses to comments (Exhibit 3) were integrated into a new final statement of reasons prepared by FGC staff with assistance from DFW. FGC staff filed the resubmittal rulemaking file with OAL on Aug 1, 2018.

On Sep 13, 2018, OAL disapproved the rulemaking file. OAL's decision of disapproval (Exhibit 4), received Sep 20, 2018 states that the changes made in the 15-day notice were substantive, the comments on the 15-day notice were not considered by FGC, and, therefore, FGC is required to adopt the final version of the regulations prior to submittal to OAL pursuant to the Administrative Procedure Act.

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In addition to the regulatory changes outlined in the 15-day notice and the other changes identified above, form DFW 1044 has been updated to the 2019 calendar year since the regulations, including the forms, will not go into effect in 2018. Further, “Speckled rattlesnake (*Crotalus mitchellii*)” is changed to “Southwestern speckled rattlesnake (*Crotalus pyrrhus*)” in subsection 42(c)(4) due to a change in the taxonomic nomenclature approved by the Committee on Standard English and Scientific Names, and published in the 8<sup>th</sup> Edition of “Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in our Understanding” in 2017. The committee adopted new taxonomic nomenclature based on a recently published genetics study and, as a result, *C. mitchellii*, as it is currently recognized, no longer occurs in California and has been replaced with the Southwestern Speckled Rattlesnake (*Crotalus pyrrhus*).

Today, FGC will consider the public comments on the 15-day notice and consider adopting the proposed regulations as amended (Exhibit 5).

### Significant Public Comments

One comment (Exhibit 2) was received on the Jun 11, 2018 notice. The author (1) recommended correcting a typographical error on form DFW 1044; (2) recommended changes to the required experience standards; (3) requested that the desired maximum quantify of venom not be required to be listed in the statement of purpose; and (4) stated that there is no description of a standard of evaluation for inspections and recommended either (a) a clear standard for humane care and treatment be provided in regulation, or (b) removing the requirement to report specific information, and stated “there should be clear definitions on how this standard is evaluated by DFW to protect permit holders from arbitrary or subjective permitting decisions and to make it easier for DFW to enforce this policy.”

### Recommendation

**FGC staff:** Under a motion to adopt the consent calendar, consider the comments received on the 15-day notice and the remainder of the revised rulemaking record, and adopt the revised proposed regulatory language.

### Exhibits

1. Jun 11, 2018 15-day notice, including amended ISOR and revised proposed regulatory language
2. Email from ZooToxins, LLC, received Jun 26, 2018
3. Summary and response to comments on the 15-day notice
4. OAL’s decision of disapproval of regulatory action, received Sep 20, 2018
5. Proposed regulatory language

### Motion/Direction

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the FGC staff recommendations for items 17-22 on the consent calendar.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**21. CASCADES FROG (CONSENT)****Today's Item****Information** ☐**Action** ☒

Consider approving DFW request for a six month extension to submit its status review report on the petition to list Cascades frog (*Rana cascadae*) as threatened or endangered under the California Endangered Species Act (CESA).

**Summary of Previous/Future Actions**

- |   |                              |
|---|------------------------------|
| • Received petition                                       | Mar 1, 2017                  |
| • FGC transmitted petition to DFW                         | Mar 6, 2017                  |
| • Published notice of receipt of petition                 | Mar 31, 2017                 |
| • Public receipt of petition                              | Apr 26-27, 2017; Van Nuys    |
| • Approved 30-day extension for evaluation of petition    | Jun 21-22, 2017; Smith River |
| • Received DFW evaluation of petition                     | Aug 16, 2017; Sacramento     |
| • FGC determined listing may be warranted                 | Oct 11-12, 2017; Atascadero  |
| • Candidacy findings published                            | Oct 27, 2017                 |
| • <b>Today act on DFW's request for 6-month extension</b> | <b>Oct 17, 2018; Fresno</b>  |
| • Receive DFW's status review report                      | Jun 12-13, 2019; TBD         |
| • Determine if listing is warranted                       | Aug 7, 2019; TBD             |

**Background**

On Mar 1, 2017, FGC received a petition from the Center for Biological Diversity to list Cascades frog as a threatened or endangered species under CESA. On Oct 11, 2017, FGC determined listing may be warranted for further evaluation, initiating a 12-month review of the status of Cascades frog in California. Receipt of the status review was originally scheduled for the Dec 2018 FGC meeting; in Aug 2018, DFW submitted a request that FGC grant a 6-month extension of time pursuant to Section 2074.6 of the Fish and Game Code. The extension would allow time for further analysis and evaluation of the available science, completion of the status review, and peer review (Exhibit 1). If the extension is approved, the due date for DFW's report would change to Apr 27, 2019—18 months from the date candidacy findings were published—and would be scheduled for receipt at the Jun 12-13, 2019 FGC meeting. FGC would then consider the petition, DFW's evaluation, and other information submitted, to determine if listing is warranted at its Aug 7-8, 2019 meeting.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Under a motion to adopt the consent calendar, approve DFW's request for a six-month extension.

**Exhibits**

1. DFW memo, received Aug 29, 2018

STAFF SUMMARY FOR OCTOBER 17, 2018

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the FGC staff recommendations for items 17-22 on the consent calendar.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**22. UPPER KLAMATH-TRINITY RIVERS SPRING CHINOOK SALMON (CONSENT)****Today's Item****Information** ☐**Action** ☒

- (A) Receive a petition to list upper Klamath-Trinity rivers spring Chinook salmon (*Oncorhynchus tshawytscha*) as an endangered species under the California Endangered Species Act (CESA).
- (B) Consider DFW's request for a 30-day extension to review the petition.

**Summary of Previous/Future Actions**

- Received petition Jul 23, 2018
- FGC transmitted petition to DFW Aug 2, 2018
- Published notice of receipt of petition Aug 17, 2018
- **Today's public receipt of petition and act on DFW's request for a 30-day extension** **Oct 17, 2018; Fresno**
- Receive DFW 90-day evaluation Dec 12-13, 2018; Oceanside
- Determine if petitioned action may be warranted Feb 6-7, 2019; Redding

**Background**

- (A) On Jul 23, 2018, FGC received a petition (Exhibit 1) from the Karuk Tribe and the Salmon River Restoration Council to list upper Klamath-Trinity rivers spring Chinook salmon as endangered under CESA (Exhibit 1). On Aug 2, 2018, FGC staff transmitted the petition to DFW for review. A notice of receipt of petition was published in the California Regulatory Notice Register on Aug 17, 2018.
- (B) California Fish and Game Code Section 2073.5 requires that DFW evaluate the petition and submit a written evaluation with a recommendation to FGC within 90 days of receiving the petition; under this section, DFW may request an extension of up to 30 days to complete the evaluation. DFW has requested a 30-day extension (Exhibit 2), which would change the due date for DFW's evaluation from Oct 31, 2018 to Nov 30, 2018.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Approve DFW's request for an extension of 30 days under a motion to adopt the consent calendar.

**Exhibits**

1. Petition, received Jul 23, 2018
2. DFW memo, received Oct 8, 2018



STAFF SUMMARY FOR OCTOBER 17, 2018

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the FGC staff recommendations for items 17-22 on the consent calendar.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**23. WILDLIFE RESOURCES COMMITTEE (WRC)****Today's Item**Information ☐Action ☒

Receive summary from the Sep 20, 2018 WRC meeting and potentially approve WRC recommendations. Receive update on WRC work plan and timeline. Discuss and potentially approve new topics for WRC review.

**Summary of Previous/Future Actions**

- Most recent WRC meeting Sep 20, 2018; WRC, Sacramento
- **Today potentially approve WRC recommendations Oct 17, 2018; Fresno**
- Next WRC meeting Jan 10, 2018; WRC, Riverside

**Background**

FGC directs the work of its committees, including WRC.

**Meeting Summary:** WRC met on Sep 20, 2018; a written summary of the meeting is provided in Exhibit 1.

At its Sep 20 meeting, WRC covered the following topics:

- Annual regulations for:
  - Upland game bird hunting
  - Sport fishing
  - Mammal hunting
  - Waterfowl hunting
  - Central Valley Chinook salmon sport fishing
  - Klamath River Basin salmon sport fishing
- Petitions to change coastal streams low-flow regulations (petition #s 2015-14 and 2015-15)
- Deer and elk tag validation regulations
- Archery equipment and crossbow regulations

**WRC Recommendations:** Based on the meeting discussions, WRC has four recommendations for FGC consideration:

1. Authorize publication of a notice of intent to amend regulations for mammal hunting, waterfowl hunting, Central Valley Chinook salmon sport fishing, and Klamath River Basin salmon sport fishing for the 2019-20 seasons.
2. Authorize publication of a notice of intent to amend deer and elk tag validation regulations as proposed.
3. Authorize publication of a notice of intent to amend archery equipment and crossbow regulations as proposed.
4. Deny petitions #2015-14 and #2015-15 (coastal streams low-flow regulations).

## STAFF SUMMARY FOR OCTOBER 17, 2018

**New Agenda Topics:** Current topics already referred to WRC are shown in Exhibit 2. No new agenda topics are recommended at this time.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Approve WRC recommendations 1-3; consider WRC recommendation 4 on coastal low-flow petitions under Agenda Item 14 – Petitions for regulation change.

**Exhibits**

1. Sep 20, 2018 WRC meeting summary
2. WRC work plan, updated Oct 2018

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission approves recommendations 1 through 3 from the September 20, 2018 Wildlife Resources Committee meeting as proposed.

**OR**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission approves recommendations 1 through 3 from the September 20, 2018 Wildlife Resources Committee meeting as proposed, except \_\_\_\_\_.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**24. SPORT FISHING (ANNUAL)****Today's Item****Information** ☒**Action** ☐

Discuss proposed changes to sport fishing regulations.

**Summary of Previous/Future Actions**

- |                                     |                             |
|-------------------------------------|-----------------------------|
| • Notice hearing                    | Aug 22-23, 2018; Fortuna    |
| • <b>Today's discussion hearing</b> | <b>Oct 17, 2018; Fresno</b> |
| • Adoption hearing                  | Dec 12-13, 2018; Oceanside  |

**Background**

DFW is proposing three changes to current sport fishing regulations, related to the definition of inland waters (Exhibit 2), Lake Perris bass (Exhibit 2), and sport fishing report cards (Exhibit 3). This proposal updates lost report card procedures for select fresh water and marine species to provide guidelines for obtaining a replacement card and for reporting harvest from a lost card without obtaining a replacement.

Exhibit 1 is the staff summary from the Aug 2018 notice meeting with a more detailed overview of proposed changes.

**Significant Public Comments (N/A)****Recommendation (N/A)****Exhibits**

1. Staff summary from Aug 22-23, 2018 FGC meeting (for background purposes only)
2. Initial statement of reasons (ISOR), sections 1.53 and 5.00
3. ISOR, Section 1.74
4. DFW memo, received Jul 11, 2018

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**25. WATERFOWLER'S HALL OF FAME****Today's Item**Information ☐Action ☒

Recognize newly inducted members of the California Waterfowler's Hall of Fame.

**Summary of Previous/Future Actions**

As a sponsor of the California Waterfowler's Hall of Fame, FGC annually recognizes inductees through the presentation of signed resolutions.

**Background**

The Waterfowler's Hall of Fame was established in 2006 to recognize those individuals who have made significant contributions to enhancing waterfowl and their habitats in California.

A small group of interested waterfowlers was instrumental in establishing the hall of fame so that major contributions and achievements of biologists, academics/professors, federal/state administrators, legislators, sportsmen, agriculturalists and other conservationists could be recognized. The selection committee includes representatives from the California Waterfowl Association, Ducks Unlimited, Pheasants and Quail Forever, Gaines and Associates, University of California Davis, National Audubon Society, and California Department of Fish and Wildlife.

Inductees or their representatives will be presented with certificates by the California Waterfowl Association. This year's inductees are Dr. Mickey E. Heitmeyer, Jeff Kerry, Peter Ottesen, Thomas Quinn, Mark Gregory Steidlmayer, and Peter Stent.

**Significant Public Comments (N/A)****Recommendation (N/A)****Exhibits**

1. Resolution for Dr. Mickey E. Heitmeyer
2. Resolution for Jeff Kerry
3. Resolution for Peter Ottesen
4. Resolution for Thomas Quinn
5. Resolution for Mark Gregory Steidlmayer
6. Resolution for Peter Stent

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission recognizes Dr. Mickey E. Heitmeyer, Jeff Kerry, Peter Ottesen, Thomas Quinn, Mark Gregory Steidlmayer and Peter Stent as members of the California Waterfowler's Hall of Fame.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**26. JERUSALEM CREEK RANCH PLM****Today's Item****Information** ☐**Action** ☒

Consider revoking, suspending or reinstating the Jerusalem Creek Ranch Private Lands Wildlife Habitat Enhancement and Management Area (PLM) License.

**Summary of Previous/Future Actions**

- Approved initial PLM license Aug 8-9, 2012; Ventura
- Approved new 5-year license Jun 21-22, 2017; Smith River
- **Consider action on suspended license Oct 17, 2018; Fresno**

**Background**

Fish and Game Code sections 3400-3409, and Title 14 Section 601 prescribe conditions for a PLM program that provides incentives for landholders to manage their property for the benefit of fish and wildlife, in exchange for access to increased recreational opportunities such as hunting tags or extended seasons. In return for a harvest program, the landholder must prepare a biologically-sound wildlife management plan and complete specific wildlife habitat improvements on the PLM property.

In Aug 2012, Jerusalem Creek Ranch in Shasta County was first approved for a five-year PLM license (2012-2017) and 2012-2013 management plan. In June 2017, the Jerusalem Creek Ranch annual management plan and new five-year license (2017-2022) was approved.

Section 601(e)(1) states that a PLM license may be suspended temporarily by DFW for a breach or violation of the terms of the license and that FGC shall be notified of any such suspension and subsequently may revoke or reinstate the license or fix the period of suspension.

DFW notified Jerusalem Creek Ranch that its PLM license was temporarily suspended pursuant to Section 601(e)(1) in a letter dated Jul 25, 2018 (Exhibit 1). DFW provided FGC a memo that documents the violations of the terms of the license (Exhibit 2). In summary, a DFW wildlife officer responded to a complaint and subsequently found numerous bait sites being operated on the Jerusalem Creek Ranch PLM property that included types of bait that were clearly intended to feed big game species; that activity is a violation of FGC regulation and of the PLM license.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Revoke the Jerusalem Creek Ranch PLM license.

**DFW:** Revoke the Jerusalem Creek Ranch PLM license.

STAFF SUMMARY FOR OCTOBER 17, 2018

**Exhibits**

1. DFW Letter to Jon Warren dated Jul 25, 2018
2. DFW memo, dated Oct 2, 2018

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission  
revokes the Jerusalem Creek Ranch PLM license.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**27. BULLFROGS AND NON-NATIVE TURTLES****Today's Item****Information** ☐**Action** ☒

Receive an update on the stakeholder engagement plan and consider approving an updated timeline.

**Summary of Previous/Future Actions**

- |  |                             |
|--|-----------------------------|
| • FGC stakeholder engagement plan presented                            | Oct 11-12, 2017; Atascadero |
| • WRC discussion   | Sep 20, 2018; Sacramento    |
| • <b>Today's discussion and potential approval of revised timeline</b> | <b>Oct 17, 2018; Fresno</b> |

**Background**

Approximately two million non-native American bullfrogs and 300,000 non-native turtles (mostly red-eared sliders and softshell turtles) are imported into California annually for food and the pet trade. Even though these species are not imported into California with the intention of being released, they have established significant wild populations that threaten native amphibians, fish, and wildlife by direct predation, competition for resources and habitat, and disease.

In Feb 2015, DFW provided a report regarding the implications of American bullfrog importation, and notified FGC of its decision to stop issuing long-term importation permits and to only issue short-term individual event permits, consistent with subsection 236(c)(6)(I). At its Feb 2015 meeting, FGC directed staff to work with DFW to identify a list of potential actions FGC could take to further address the issues identified in the DFW report.

In Feb 2017, FGC staff presented four possible regulatory options to address impacts on California's native wildlife resulting from the importation of American bullfrogs and non-native turtles, and provided additional information in a joint memorandum prepared by FGC and DFW staff. At the meeting, FGC directed staff to add this topic to its Apr 2017 agenda for further discussion with more information on two of the four options. In Apr 2017, FGC directed FGC and DFW staff to develop a proposal for stakeholder engagement to further evaluate possible solutions to addressing the impacts of American bullfrogs and non-native turtles on native wildlife; the proposal with a timeline was presented at the Oct 2017 FGC meeting. A new timeline was introduced at the Sep 2018 WRC meeting for discussion and comment.

Today, staff will present the proposed plan for stakeholder engagement on American bullfrogs and non-native turtles updated with a revised timeline for FGC consideration.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Approve the stakeholder engagement plan with updated timeline.



STAFF SUMMARY FOR OCTOBER 17, 2018

**Exhibits**

1. Proposed stakeholder engagement plan and timeline, updated Oct 5, 2018

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission approves the plan for stakeholder engagement on American bullfrogs and non-native turtles, with updated timeline, as proposed.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**28. WILDLIFE AND INLAND FISHERIES NON-REGULATORY REQUESTS****Today's Item****Information** ☐**Action** ☒

This is a standing agenda item for FGC to act on non-regulatory requests from the public that concern wildlife and inland fisheries. For this meeting:

- (A) Action on non-regulatory requests received at the Aug 2018 meeting.
- (B) Update on pending non-regulatory requests referred to FGC staff or DFW for review.

**Summary of Previous/Future Actions**

(A)

- FGC receipt of requests Aug, 22-23, 2018; Fortuna
- **Today's action on requests** **Oct 17, 2018; Fresno**

(B)

N/A

**Background**

FGC provides direction regarding requests from the public received by mail and email and during public forum at the previous FGC meeting. Public requests for non-regulatory action follow a two-meeting cycle to ensure proper review and consideration.

- (A) **Non-regulatory requests.** Non-regulatory requests scheduled for consideration today were received at the Aug 2018 meeting in one of three ways: (1) submitted by the comment deadline and published as tables in the meeting binder, (2) submitted by the late comment deadline and delivered at the meeting, or (3) received during public comment.

Today, three non-regulatory requests received at the Aug 2018 meeting are scheduled for action:

- I. Request to use non-lethal management strategies for beavers
- II. Request to schedule approval of Cañada San Vicente Land Management Plan
- III. Request to engage the Department in ensuring that water settlement agreements support salmon

Exhibit A1 summarizes and contains staff recommendations for each request; individual written requests are provided as exhibits A2-A3.

- (B) **Pending non-regulatory requests.** This item is an opportunity for staff to provide a recommendation on non-regulatory requests that were scheduled for action at a previous meeting and referred by FGC to staff or DFW for further review.

No items are scheduled for action today.

**Significant Public Comments (N/A)**

STAFF SUMMARY FOR OCTOBER 17, 2018

**Recommendation**

(A) Adopt staff recommendations for Aug 2018 non-regulatory requests (Exhibit A1).

**Exhibits**

- A1. List of wildlife/inland fisheries non-regulatory requests and staff recommendations for requests received through Aug 23, 2018
- A2. Postcard from Julie Solo, received Jul 9, 2018
- A3. Email from Gary Brennan, San Diego County Wildlife Federation, received Jul 29, 2018

**Motion/Direction**

(A) Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the staff recommendation for actions on on August 2018 non-regulatory requests.

**OR**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission adopts the staff recommendations for actions on on August 2018 non-regulatory requests, except for item(s) \_\_\_\_\_ for which the action is \_\_\_\_\_.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**29A. ADMINISTRATIVE ITEMS – NEXT MEETING****Today's Item**Information ☐Action ☒

This is a standing agenda item to review logistics and approve draft agenda items for the next FGC meeting.

**Summary of Previous/Future Actions (N/A)****Background**

The next FGC meeting is scheduled for Dec 12-13, 2018 in Oceanside. Oceanside is approximately 45 minutes from the San Diego International Airport and 60 minutes from the John Wayne Airport. Staff does not anticipate any special logistics for this meeting.

Potential agenda items for the Dec meeting are provided in Exhibit 1 for consideration and potential approval.

Note that for 2019 FGC meetings, wildlife and inland fisheries items will be heard on the first day and marine items will be heard on the second day.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Approve draft agenda topics for Dec 12-13, 2018 FGC meeting.

**Exhibits**

1. Potential agenda items for the Dec 2018 meeting

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission approves the draft agenda items for the December 12-13, 2018 Commission meeting, as amended today.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**29B. POTENTIAL MEETING LOCATION CHANGES****Today's Item****Information** ☐**Action** ☒

Consider approving a change in meeting location for three FGC meetings in 2019 and adding a teleconference meeting for May 16, 2019.

**Summary of Previous/Future Actions**

- |   |                             |
|---|-----------------------------|
| • Receive/discuss proposed 2019 meeting schedule  | Jun 20-21, 2018; Sacramento |
| • Adopt 2019 meeting schedule                     | Aug 22-23, 2018; Fortuna    |
| • <b>Today potentially adopt changes for 2019</b> | <b>Oct 17, 2018; Fresno</b> |

**Background**

FGC annually considers changes to inland sport fishing regulations at its Aug, Oct and Dec meetings. DFW has recently indicated that it will soon request to bring in the latter part of 2019 a significant rulemaking to revise California's inland sport fishing regulations that will affect anglers throughout the state. Currently, FGC's Aug, Oct and Dec 2019 meetings are scheduled in the central or southern parts of the state (Mammoth Lakes, Los Angeles area and San Diego, respectively); moving at least one of the three sport fish hearings to Redding or Sacramento would allow for public input from constituents in the northern part of the state.

Additionally, DFW is requesting that FGC hold a teleconference meeting in May to potentially adopt regulations for the Central Valley and Klamath River Basin inland salmon fisheries. The Pacific Fishery Management Council will adopt final recommendations for recreational and commercial ocean salmon fisheries in mid-Apr and DFW will provide recommendations for state regulation changes at the Apr 17-18, 2019 FGC meeting. Scheduling FGC action for May will give commissioners and anglers an opportunity to review and discuss the recommendations.

**Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Approve three meeting location changes as noted in Table 1 (next page) and add a teleconference meeting for May 16, 2019.

**Exhibits (N/A)****Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission approves the meeting location changes as discussed today and adds a teleconference on May 16, 2019.

## STAFF SUMMARY FOR OCTOBER 17, 2018

**Table 1: Proposed Changes to FGC 2019 Meeting Schedule and Locations**

Meeting Date	Commission Meeting	Committee Meeting
January 10		<b>Wildlife Resources</b> Ontario
February 5		<b>Tribal</b> <del>Redding</del> <u>Sacramento area</u>
February 6-7	<del>Redding</del> <u>Sacramento area</u>	
March 19		<b>Marine Resources</b> Monterey/Marina
April 17-18	<del>Fresno</del> or Bakersfield	
May 16		<b>Wildlife Resources</b> Sacramento
<u>May 16</u>	<u>Teleconference</u>	
June 11		<b>Tribal</b> <del>Lake Tahoe Area</del> or <del>Sacramento</del> <u>Redding</u>
June 12-13	<del>Lake Tahoe area</del> or <del>Sacramento</del> <u>Redding</u>	
July 11		<b>Marine Resources</b> San Clemente
August 7-8	<del>Mammoth or Bishop</del> <u>Sacramento area</u>	
September 5		<b>Wildlife Resources</b> Santa Rosa
October 8		<b>Tribal</b> Los Angeles area
October 9-10	Los Angeles area	
November 5		<b>Marine Resources</b> Sacramento
December 11-12	San Diego area	

## STAFF SUMMARY FOR OCT 17, 2018

**29C. ADMINISTRATIVE ITEMS – RULEMAKING TIMETABLE****Today's Item****Information** ☐**Action** ☒

Review and consider approving requested changes to the perpetual timetable for anticipated regulatory actions.

**Summary of Previous/Future Actions**

- FGC approved changes to rulemaking timetable Aug 22-23, 2018; Fortuna
- **Today consider approving proposed rulemaking timetable Oct 17, 2018; Fresno**

**Background**

FGC maintains a perpetual timetable for anticipated regulatory actions. At each FGC meeting, staff provides the latest approved timetable along with requests for changes from FGC staff and DFW highlighted in bolded and underlined blue text (Exhibit 1).

For this meeting, FGC staff has amended the timeline to add potential adoption of the commercial use and possession of rattlesnakes for this meeting (Agenda Item 20) to accommodate actions required under the Administrative Procedure Act.

Via memo (Exhibit 2), DFW requests two schedule changes to FGC's regulatory timetable :

- Move up from TDB the rulemaking to amend subsection 27.65(b)(12) to add California sheephead to the list of fish that may be filleted on vessels, with notice at the Oct 2018 meeting, discussion at the Dec 2018 meeting, and adoption at the Feb 2019 meeting. The sport fishing industry, including the Sportfishing Association of California (SAC) have been advocating for the implementation of a fillet length regulation that permits the fish to be filleted at sea, which is preferred by anglers. DFW has completed a study and is ready to advance this long-awaited rulemaking for the next season. Sheephead fillet was added to today's agenda as Agenda Item 17.
- Add a rulemaking to adopt Section 29.11 as a standard rulemaking for establishing a recreational purple sea urchin take limit. Conditions in northern California kelp forests have not improved, and DFW scientists must continue to study the effect of purple sea urchin removal. The requested meeting schedule is notice at the Oct 2018 meeting, discussion at the Dec 2018 meeting, and adoption at the Feb 2019 meeting. Recreational purple sea urchin was added to today's agenda as Agenda Item 6.

DFW also requests to extend the emergency action FGC took at its Apr 18-19, 2018 meeting to increase the take of purple sea urchin for an additional 90 days to allow more time to evaluate the effectiveness of increased take on restoring northern California's kelp forests and red abalone populations. Recreational purple sea urchin (emergency extension) was added to today's agenda as Agenda Item 18.

**Significant Public Comments (N/A)**

STAFF SUMMARY FOR OCT 17, 2018

**Recommendation**

**FGC staff:** Adopt the proposed changes to the timetable for anticipated regulatory actions and provide direction on the scheduling of any rulemaking changes identified during the meeting.

**Exhibits**

1. Proposed timetable for anticipated regulatory actions, dated Oct 5, 2018
2. DFW memo requesting changes to the FGC timetable, received Sep 25, 2018

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission approves the proposed changes to the rulemaking timetable.



STAFF SUMMARY FOR OCTOBER 17, 2018

**29D. ADMINISTRATIVE ITEMS – NEW BUSINESS**

**Today's Item**

**Information** ☒

**Action** ☐

This is a standing agenda item to allow Commissioners to bring new items of business to FGC.

**Summary of Previous/Future Actions (N/A)**

**Background (N/A)**

**Significant Public Comments (N/A)**

**Recommendation (N/A)**

**Exhibits (N/A)**

**Motion/Direction (N/A)**

## STAFF SUMMARY FOR OCTOBER 17, 2018

**EXECUTIVE SESSION****Today's Item**Information ☐Action ☒

Executive session will include four standing topics:

- (A) Pending litigation to which FGC is a party
- (B) Possible litigation involving FGC
- (C) Staffing
- (D) Deliberation and action on license and permit items

**Summary of Previous/Future Actions (N/A)****Background**

During the public portion of its meeting, FGC will call a recess and reconvene in a closed session pursuant to the authority of Government Code subsections 11126(a)(1), (c)(3), and (e)(1), and Section 309 of the Fish and Game Code. FGC will address the following items in closed session:

**(A) Pending litigation to which FGC is a party**

See agenda for a complete list of pending civil litigation to which FGC is a party.

**(B) Possible litigation involving FGC**

None to report at the time the meeting binder was prepared.

**(C) Staffing**

The executive director has started a temporary assignment as DFW's chief deputy director. FGC's deputy executive director is fulfilling the role of acting executive director consistent with the deputy executive director's duty statement.

**(D) Deliberation and action on license and permit items**

- I. *Reese appeal*: Title 14 of the California Code of Regulations, Section 467, requires trappers to submit by Jul 1 each year an annual report for the preceding year, even if the take was zero furs; if the trapper fails to do so, Sec. 467 requires DFW to suspend the license. DFW provided Tyler Reese a notice of suspension of his trapping license pursuant to this section (Exhibit D1). Mr. Reese submitted to FGC a request to have his license reinstated (Exhibit D2). DFW subsequently submitted a letter to FGC stating that DFW does not object to Mr. Reese's request (Exhibit D3). Sec. 467 allows FGC to reinstate the license, notwithstanding the untimely submission.
- II. *Giannini appeal*: DFW provided Christopher Giannini a notice of suspension of his trapping license pursuant to Sec. 467 (Exhibit D4). Mr. Giannini submitted to FGC a request to have his license reinstated (Exhibit D5). DFW subsequently submitted a letter to FGC stating that DFW does not object to Mr. Giannini's request (Exhibit D6).

## STAFF SUMMARY FOR OCTOBER 17, 2018

- III. *Janis appeal*: Gregory Janis attempted to transfer a sea cucumber dive permit to Mr. Conner Rhoads and DFW denied the request. Mr. Janis appealed the decision to FGC. FGC referred the matter to the Office of Administrative Hearings and received a proposed decision dated Sep 14, 2018 (Exhibit D7). The proposed decision finds that Mr. Janis failed to meet the statutory qualifications for transfer; accordingly, the proposed decision holds that his appeal should be denied and the requested permit transfer should be denied.

**Recommendation**

- (D) **FGC staff**: Grant the appeal filed by Tyler Reese. Grant the appeal filed by Christopher Giannini. Adopt the proposed decision in Mr. Janis' appeal.

**Exhibits**

- D1. Letter from DFW to Tyler Reese, dated Jul 19, 2018
- D2. Fax from Tyler Reese to FGC, received Jul 24, 2018
- D3. Letter from DFW to FGC regarding the Reese appeal, received Sep 18, 2018
- D4. Letter from DFW to Christopher Giannini, dated Jul 19, 2018
- D5. Email from Mr. Giannini to FGC, received Aug 7, 2018
- D6. Letter from DFW to FGC regarding the Giannini appeal, received Sep 18, 2018
- D7. Proposed decision from the Office of Administrative Law, In the Matter of the Statement of Issues Against Gregory Janis, dated Sep 14, 2018

**Motion/Direction**

- (D) Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission grants the appeal by Tyler Reese, grants the appeal by Christopher Giannini, and adopts the proposed decision In the Matter of the Statement of Issues Against Gregory Janis.

**CALIFORNIA FISH AND GAME COMMISSION**  
**RECEIPT LIST FOR REGULATION CHANGE REQUESTS: RECEIVED BY 5 PM ON OCTOBER 4, 2018**  
 Revised 10-10-2018

**FGC** - California Fish and Game Commission   **DFW** - California Department of Fish and Wildlife   **WRC** - Wildlife Resources Committee   **MRC** - Marine Resources Committee

Tracking No.	Date Received	Accept or Reject	Name of Petitioner	Subject of Request	Code or Title 14 Section Number	Short Description	FGC Decision
2018-013	9/19/2018	A	Mike McCorkle	Ridgeback Prawn	T14, 120.3	Allow Ridgeback Prawn to be only taken by trawl from sunrise to sunset as noted on monthly calendar.	<b>Receipt: 10/17/2018</b> <b>Action scheduled: 12/12-13/2018</b>
2018-014	10/4/2018	A	James Stone	Boat Limit of Finfish	T14, 27.60 C	Request is to allow anglers to continue fishing until boat limits are reached while fishing for finfish in inland waters. This will achieve parity with existing regulations for ocean and bay fishing.	<b>Receipt: 10/17/2018</b> <b>Action scheduled: 12/12-13/2018</b>

**CALIFORNIA FISH AND GAME COMMISSION**  
**RECEIPT LIST FOR NON-REGULATORY ACTION: RECEIVED BY 5 PM ON OCTOBER 4, 2018**  
**Revised 10-09-18**

**FGC** - California Fish and Game Commission   **DFW** - California Department of Fish and Wildlife   **WRC** - Wildlife Resources Committee   **MRC** - Marine Resources Committee

<b>Date Received</b>	<b>Name of Petitioner</b>	<b>Subject of Request</b>	<b>Short Description</b>	<b>FGC Decision</b>
8/17/2018	Brigitte Robertson	Hunting in areas affected by wildfires	Request that FGC cancel the hunting seasons in areas affected by recent wildfires.	<b>Receipt: 10/17/2018</b> <b>Action scheduled: 12/12-13/2018</b>
9/5/2018	Steffanie Byrnes	Coyote	Request FGC to take action to reduce the coyote population in urban areas.	<b>Receipt: 10/17/2018</b> <b>Action scheduled: 12/12-13/2018</b>



2018 SEP 19 PM 12:55

Tracking Number: (2018-013)

To request a change to regulations under the authority of the California Fish and Game Commission (Commission), you are required to submit this completed form to: California Fish and Game Commission, 1416 Ninth Street, Suite 1320, Sacramento, CA 95814 or via email to [FGC@fgc.ca.gov](mailto:FGC@fgc.ca.gov).  
Note: This form is not intended for listing petitions for threatened or endangered species (see Section 670.1 of Title 14).

Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or [FGC@fgc.ca.gov](mailto:FGC@fgc.ca.gov).

## SECTION I: Required Information.

*Please be succinct. Responses for Section I should not exceed five pages*

### 1. Person or organization requesting the change (Required)

Name of primary contact person: Click here to enter text. **MIKE MCCORKLE SETA**  
Address: Click here to enter text.  
Telephone number:  
Email address: Click here to enter text.

### 2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: Click here to enter text. **Sections 8591, 8841, & 8842 added by petitioner via email on 10/9/2018 (attached)**

### 3. Overview (Required) - Summarize the proposed changes to regulations: Click here to enter text.

**Add - RIDGE BACK PRAWN may only be taken by TRAWL from SUN RISE TO SUNSET AS NOTED ON MONTHLY CALENDAR**

### 4. Rationale (Required) - Describe the problem and the reason for the proposed change: Click here to enter text.

**OVER FISHING IS TAKING PLACE BY BOATS FISHING 24 HRS. A DAY SOME TIMES UP TO 36 HRS STRAIGHT. THIS IS TAKING PLACE ON AREAS OF SMALL SHRIMP**

## SECTION II: Optional Information

**By allowing daylight hrs. of fishing this could cut the effort in half, which would save a lot of small shrimp from being taken.**

### 5. Date of Petition: Click here to enter text. **9-14-18**

### 6. Category of Proposed Change

- ☐ Sport Fishing  
☒ Commercial Fishing  
☐ Hunting  
☐ Other, please specify: Click here to enter text.

**FISHERMEN SUPPORT THIS CHANGE**





7. **The proposal is to:** (To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)  
☒ Amend Title 14 Section(s): ADD TO CURRENT REGS.  
☐ Add New Title 14 Section(s): Click here to enter text.  
☐ Repeal Title 14 Section(s): Click here to enter text.
8. **If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition** Click here to enter text.  
Or ☐ Not applicable.
9. **Effective date:** If applicable, identify the desired effective date of the regulation.  
If the proposed change requires immediate implementation, explain the nature of the emergency: THE SHARK ARE BEING OVERFISHED AND ARE NOT REACHING FULL GROWTH
10. **Supporting documentation:** Identify and attach to the petition any information supporting the proposal including data, reports and other documents: Click here to enter text.
11. **Economic or Fiscal Impacts:** Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: Click here to enter text. NONE
12. **Forms:** If applicable, list any forms to be created, amended or repealed:  
Click here to enter text.

### SECTION 3: FGC Staff Only

Date received: Click here to enter text.

FGC staff action:

- ☐ Accept - complete  
☐ Reject - incomplete  
☐ Reject - outside scope of FGC authority

Tracking Number

Date petitioner was notified of receipt of petition and pending action: \_\_\_\_\_

Meeting date for FGC consideration: \_\_\_\_\_

FGC action:

- ☐ Denied by FGC  
☐ Denied - same as petition \_\_\_\_\_  
Tracking Number  
☐ Granted for consideration of regulation change

RECEIVED  
CALIFORNIA  
FISH AND GAME  
COMMISSION

2018 SEP 13 1:12:55

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**From:** McCorkle Fishing Enterprises  
**Sent:** Tuesday, October 9, 2018 3:50 PM  
**To:** Ashcraft, Susan@FGC  
**Cc:** FGC  
**Subject:** Re: Ridgeback Prawn Petition to Fish and Game Commission

Susan,

I would like to add to our petition on Ridge back prawn the following code sections, 8591, 884`1 and 8842.

Mike Mccorkle , Southern Ca. Trawlers assn.

On 10/4/2018 7:05 PM, Ashcraft, Susan@FGC wrote:

Dear Mike,

I mentioned in my last email that I would send you a separate message regarding your recently submitted petition to limit the fishing hours for ridgeback prawn fishing from sunrise to sunset. There is some information that needs to be revised before we can accept it as complete and schedule it for receipt by the Commission at their October meeting.

In Section 1 of the petition, there is a part to fill in Authority (Part 2 of Section 1). I noticed that you identified the *regulation* section you wish to change in Title 14, CCR. However, this section requires that you identify the specific law (either in legislatively enacted code or in the state constitution) that would allow the change you request. In other words, the law that authorized the Commission to adopt regulations governing ridgeback prawn in the first place, and authorizes them to make the changes you request. You started at a good point, by looking at the existing regulations. Each regulations section includes a list of laws (or Fish and Game Code sections) that those regulations cite to for authority. You referenced Section 120.3 of Title 14 CCR. That regulation cites **Sections 710.7, 711, 713, 1050, 8591, 8841, and 8842** of the Fish and Game Code. I have provided a link to the Fish and Game Code below.

You can look up the cited sections to identify which one(s) give the Commission authority to make the change you re requesting. Or you could just stop by the Department of Fish and Wildlife office in Santa Barbara, and they have a printed book copy of the whole Fish and Game Code that you can use to review the sections I listed above to identify which apply.

If you want to try doing it online, the link for Fish and Game Code is:

<https://leginfo.legislature.ca.gov/faces/codesTOCSelected.xhtml?tocCode=FGC>

On the right side above the list of code sections there is a drop down menu for "Code" and then you can type in the "Section" number.

Once you decide which sections you'd like to list, please send an email to [FGC@fgc.ca.gov](mailto:FGC@fgc.ca.gov) (with a cc to me) with the list, and in the email request that we add the list to Section 1 of your petition.



Thanks so much Mike, and just give me a call if you have questions or if you need assistance with completing your petition.

Best regards,

Susan

**Susan Ashcraft**

Marine Advisor

California Fish and Game Commission

1416 9<sup>th</sup> Street, Room 1320

Sacramento, CA 95814

Office: (916) 653-1803

Cell: (650) 222-9036



Tracking Number: 2018-014

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Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or [FGC@fgc.ca.gov](mailto:FGC@fgc.ca.gov).

## **SECTION I: Required Information.**

*Please be succinct. Responses for Section I should not exceed five pages*

### **1. Person or organization requesting the change (Required)**

Name of primary contact person: Northern California Guides and Sportsmen's Association, James Stone, President

Address:

Telephone number:

Email address: [jstone@ncgasa.org](mailto:jstone@ncgasa.org)

### **2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested:** Authority Cited: Sections 200, ~~202~~265, and 7071 and ~~8587.1~~, Fish and Game Code. Reference: Sections ~~205~~, ~~210~~255, 7071 and 7120, Fish and Game Code.

### **3. Overview (Required) - Summarize the proposed changes to regulations:** The Northern California Guides and Sportsmen's Association (NCGASA) is asking for an amendment to 27.60(c) relative to boat limits. 27.60 (c) currently allows, when two or more persons that are licensed or otherwise authorized to sport fish in ocean waters off California or in the San Francisco Bay District, defined in Section 27.00, are angling for finfish aboard a vessel in these waters, fishing by all authorized persons aboard may continue until boat limits of finfish are taken and possessed aboard the vessel as authorized under this section or Section 195, Title 14, CCR. The authorization for boat limits aboard a vessel does not apply to fishing trips originating in California's Sacramento Valley and Delta, creating a parity issue between bay and ocean fishing parties, and those who choose to fish inland, in the Delta, or other locations.

### **4. Rationale (Required) - Describe the problem and the reason for the proposed change:** There is a parity issue between guided fishing trips in the bay and the ocean and those occurring inland (Delta and Sacramento Valley) when it comes to boat limits with two or more anglers on board. In the bay and ocean, ALL anglers may continue to fish, with their rods in the water, until boat limits of finfish are taken aboard. On guided trips inland, in the Delta and Sacramento Valley, once an angler has taken his/her limit of fish, that angler must REMOVE their rod from the river and sit in the boat until the other anglers have caught their limit. This can result in some anglers sitting idly in guides boats for hours on



end, reducing enthusiasm and willingness to participate in such activities in the future. NGCASA believes that our clients, who are abiding by all the same rules and regulations, and subject to the annual bag limits imposed by the Commission, should qualify for the same boat limits flexibility as bay and ocean fishing trips, allowing all anglers to continue pursuit until boat limits of finfish are taken. This issue was exacerbated in 2018 when the inland fishery bag limit for fall run salmon was reduced to 1 per person. This change, prompted by significant declines of returning adults, has led to a reduced interest in booking inland river guided trips. We are further exacerbating the situation by imposing the “you can only fish for your own fish” standard when the same does not apply to bay and ocean fishing. Many of our clients, who also fish those waters, are not familiar with the restriction, and don’t find out about it until they are sitting in our boats and we have to take their rods and tell them they are done for the day. Several have told us point blank that with a 1 per person limit, coupled with this restriction, that they would rather take their money and business to guided trips on the bay and ocean (please see the economic section below for further justification of this exact problem). Establishing boat limit parity for inland fisheries would create a more enjoyable experience for all parties involved, the anglers, sportsmen and women, fishing guides, and the communities that benefit from fishing tourism. It would also provide incentive for anglers to book fishing trips in the Sacramento Valley, especially with the restrictions of the 1 fish bag limit. (As an illustrative example, this regulation change would allow a father to hook a fish for his daughter, and hand it off to her to achieve her limit, while educating and teaching her the values of conservation and the pursuit of angling harvest).

## **SECTION II: Optional Information**

**5. Date of Petition: 10/3/18**

**6. Category of Proposed Change**

- ☒ Sport Fishing
- ☐ Commercial Fishing
- ☐ Hunting
- ☐ Other, please specify: [Click here to enter text.](#)

**7. The proposal is to:** *(To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)*

- ☒ Amend Title 14 Section(s):27.60 (c)
- ☐ Add New Title 14 Section(s): [Click here to enter text.](#)
- ☐ Repeal Title 14 Section(s): [Click here to enter text.](#)

**8. If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition** [Click here to enter text.](#)

Or ☒ Not applicable.

**9. Effective date:** If applicable, identify the desired effective date of the regulation. If the proposed change requires immediate implementation, explain the nature of the emergency: [Effective for the start of the 2019 recreational fishing season.](#)

**10. Supporting documentation:** Identify and attach to the petition any information supporting the proposal including data, reports and other documents: None



- 11. Economic or Fiscal Impacts:** Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: The following is an economic analysis on the impacts of a declining fishery on professional guides and the communities in which they do their business. NOTE: These numbers are just for the FALL RUN salmon season. It does not include stripers, late fall run, shad, sturgeon, steelhead, and rainbow trout. At the peak of the fishery in the early 2000's, it is estimated that guiding and associated industries brought in roughly \$55M for the counties of Sacramento, Shasta, Butte, Sutter, Yuba, Tehama, Glenn, and Colusa. Roughly \$30M of that was direct revenue for guide services. As the health of the fishery has declined, so to have the economics of the industry. By 2017 the industry had collapsed to a fraction of its former self, roughly \$14.5M in total and \$10.5M in direct guide revenue. How do we calculate these numbers? For direct guide revenue: There are currently 100 full time guides that guide 350 clients per year. There are 350 part time guides who guide 50 clients per year. This is a total of 52,500 clients. The average charge, per person, in 2017 was \$200/head. This is \$10.5M in revenue. For community revenue: Roughly 65% of clientele come from out of the area. At two beds per room per night (conservative assuming people share rooms), that's 34,125 clients in 17,062 hotel room nights. At \$100 per night, that's \$1.7M. For just those from out of town, calculate lunch and dinner at \$20 per meal for a total \$1,365M. Add breakfast at \$10 for a total of \$341,250. Assume 3 people travel per car and need one tank of gas, so that's 34,125 / 3 per car = 11,375 cars x \$60 fill up for a total of \$682,500 for fuel. That is the additional \$4M in community benefit. None of this accounts for revenue from fishing licenses to CDFW (either 1 day, 2 day, or annual licenses), bait, tackle, gear, tips, alcohol, additional entertainment (movies, shopping, etc). It also doesn't include guides expenditures in the community: buying fuel, gear, boat repairs, etc. Given how shocking the economic decline is between 2000 and 2017, it's even worse in 2018 with the newly imposed 1 fish bag limit. In 2018, everyone has dropped rates \$25 to \$50 to encourage bookings. Full timers did not drop prices as much, part-timers did more, but everyone is taking a haircut. In addition, bookings with guides, based on conservative estimates, are off at least 50%. Out of town visitors are simply not coming, considering 1 fish limit not worth the time and expense to book a fishing trip. Calculating the 2018 economic impact: Use an average rate of \$175 (\$200/head minus \$25 reduction) 100 full time and 350 part time guides, with a 50% decrease in bookings, direct guide revenue alone is down to \$4,593,750. Cut in half the number of hotel rooms, meals, gas and other incidentals and you start to see the impacts on the broader community. The total economic benefit estimate for 2018 is \$7,294,375, a 86% reduction from the early 2000's. Guides are losing homes, leaving their families behind (if they can) and guiding and fishing in OR, WA, AK, and ID to make money (roughly 15% of the guiding community have left). This data is compiled from NCGASA members (500+ guides) and their clients. Information was collected via direct guide surveys over phone, email, and Facebook polls.

- 12. Forms:** If applicable, list any forms to be created, amended or repealed:

None

### SECTION 3: FGC Staff Only

Date received: [Click here to enter text.](#)

FGC staff action:

- ☒ Accept - complete  
☐ Reject - incomplete

RECEIVED  
CALIFORNIA  
FISH AND GAME  
COMMISSION

2018 OCT -4 AM 9:00



☐ Reject - outside scope of FGC authority

Tracking Number

Date petitioner was notified of receipt of petition and pending action: October 17, 2018

Meeting date for FGC consideration: December 12-13, 2018

FGC action:

☐ Denied by FGC

☐ Denied - same as petition \_\_\_\_\_

Tracking Number

☐ Granted for consideration of regulation change

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**From:** Brigitte  
**Sent:** Friday, August 17, 2018 12:20 PM  
**To:** FGC  
**Subject:** Please cancel hunting season

To whom it may concern:

I am writing to ask you to please cancel hunting season in the areas affected by the wildfires this year. They have suffered enough! Please don't forget that these animals are sentient beings.

Brigitte Robertson, RN, MA, LMFT

*This e-mail message is intended only for the named recipient(s) above. This e-mail is confidential and may contain information that is privileged or exempt from disclosure under applicable law. If you have received this message in error, please immediately notify the sender by return e-mail and delete this e-mail message from your computer.*

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**From:**  
**Sent:** Wednesday, September 5, 2018 11:34 AM  
**To:** FGC  
**Subject:** Coyotes

I would like to share a very upsetting experience with a coyote. Sadly, my bengal managed to escape from my home in Orange, California. She was killed by a coyote soon after. There are missing posters all over Orange of missing pets. It is usually small dogs and cats. We have a out of control population in this area. Stray cats, as well as ferals, do not last long in this area. On social media in thos area, people complain about this issue constantly.

I have a friend that has the same issue in Long Beach, California. The coyotes are not even afraid of people anymore. This issue has gotten so bad that pets have been taken from backyards, as well as on the leash during daytime hours while their guardians walk them.

My friend was walking her small sized dog and a pack of young coyotes tried to attack her dog. Luckily, she spotted the coyotes in back of her and scared them off.

I am beyond tired of the California Fish and Wildlife ignoring this issue because of animal right activists. The population in some areas are out of control. It is jeopardizing the well being of innocent pets as well as other wildlife. Coyotes have no known predator, and thrive in urban environments. It is time to cull the population to a manageable size! We cannot live in harmony with coyotes being able to kill indiscriminately. You have a obligation to the people of California, as well as other wildlife being killed daily. It is also dangerous that these animals have lost their fear of people. Ignoring this problem is wrong and is negligence! People should be able to enjoy walking in their neighborhoods without worrying about their pets being constantly killed. You should be able to enjoy your backyard without a coyote jumping over the fence and killing pets!

Dogs should be able to use the restroom without their owner constantly watching them with pepper spray at hand in their own backyards. Why should we have to live like this?! Just because some organizations which ignore reality is against this?! Is California going to pay me the 800 dollars for the loss of my bengal?! Please do something about this issue. Please stop ignoring this problem. Sometimes hard choices need to be made for the betterment of California!

Thank you so much for not banning hybrid cats in 2014. I will always be grateful for that. As I love mine to death. Please stop ignoring this issue and do something!

Thank You,

Steffanie Byrnes



Chamber of Commerce  
& Interagency Visitors Center

HOME OF THE TOUR OF THE  
CALIFORNIA ALPS - DEATH RIDE®

ALPINE COUNTY  
FILM COMMISSION OFFICE

CHARTER MEMBER OF THE  
SCENIC BYWAY ASSOCIATION

RECEIVED  
CALIFORNIA  
FISH AND GAME  
COMMISSION

2018 AUG -7 PM 1:20

Friday, August 3, 2018

Ms. Valerie Termini  
Executive Director  
California Fish and Game Commission  
P.O. Box 944209  
Sacramento, CA 94244-2090

RE: Removal of the Hope Valley Wildlife Area Land  
Pass Program

Dear Ms. Termini:

We would like to submit our support letter for the Alpine County Board of Supervisors' petition to the California Fish and Game Commission for a regulation change to remove Hope Valley Wildlife Area from the Lands Pass Program.

As a community that relies heavily on a strong tourism market, this program greatly impacts our local businesses, residents and our visitors that enjoy the Hope Valley area year round.

We feel strongly that these lands remain open without fees for all to access and enjoy.

Thank you for working with the Alpine County Board of Supervisors to reverse this regulatory action.

Sincerely,

Teresa Burkhauser, CMP  
Executive Director on behalf of the  
Alpine County Chamber of Commerce  
Board of Directors

cc: Alpine County Board of Supervisors

3 WEBSTER STREET  
P.O. BOX 265  
MARKLEEVILLE, CA 96120  
(530) 694-2475  
fax (530) 694-2478





August 30, 2018

Valerie Termini, Executive Director  
California Fish and Wildlife Commission  
P.O. Box 944209  
Sacramento, CA 94224-2090  
RE: Request to remove Hope Valley Area from the Lands Pass Program

Dear Ms. Termini,

The Kirkwood Meadows Public Utility District (District) Board of Directors joins the Alpine County Board of Supervisors in support of their request that the California Fish and Wildlife Commission remove the Hope Valley Wildlife Area from the Lands Pass Program.

The enforcement area of the Lands Pass Program within the Hope Valley Wildlife Area is largely unknown, not only by the local community, but more importantly tourists, and there is a dearth of signage explaining the rules of the Lands Pass Program or delineating the boundaries of an enforcement area. This is an added expense and a deterrent to people wishing to enjoy recreation in Hope Valley, which in turn, has a direct impact on the local economy. Some of our own employees have stopped using this area for recreation due to this confusion.

Hope Valley has a rich history of land use and recreation and was ultimately preserved for public enjoyment by a group of engaged citizens, Friends of Hope Valley. The District's Board of Directors supports keeping these lands public and open for all to access and enjoy, free of charge.

We thank you for considering the impacts of the Lands Pass Program on our community and working with the Alpine County Board of Supervisors to remove the Hope Valley Wildlife Area from the Lands Pass Program.

Sincerely,

A handwritten signature in blue ink, appearing to read "Erik M. Christeson", is written over a horizontal line.

Erik M. Christeson  
General Manager, Kirkwood Meadows PUD



# Alpine Watershed Group

*Protecting the Headwaters of the California Alps*

RECEIVED  
CALIFORNIA  
FISH AND WILDLIFE  
COMMISSION

2018 SEP 21 12:15

September 19, 2018

California Fish and Wildlife Commission  
PO Box 944209  
Sacramento, CA 94224-2090

Attn: Valerie Termini, Executive Director

Re: Request to Remove the Hope Valley Unit from the Lands Pass Program

Dear Ms. Termini,

On behalf of the Alpine Watershed Group's Board of Directors, this letter is to request removal of Hope Valley from the Lands Pass Program. Our organization seeks to increase public use and appreciation of the public lands of the valley, and we find that the Lands Pass is a deterrent to these public goals.

A key issue is the handicapped access point which was funded separately and especially to allow wheelchair access to the West Fork of the Carson River (see photos at end of letter). Unfortunately, a warning sign at that point is a significant deterrent. It is certainly inappropriate to charge for use of this facility. Cell phone access is limited or non-existent at that location, and even if connected, the visitor cannot obtain instant permission for entry. Visitors are turned away.

A further concern is that many visitors take nothing from the land, as they are simply into hiking, painting, cross-country skiing, or photography. No warden or other state employee is needed to supervise their use. Even the trash containers are maintained by private interests, not California Department of Fish and Wildlife (CDFW).

Land ownership in the valley is a mixture of US Forest Service, private, and CDFW. It is not possible for a visitor to know which lands are which. Such uncertainty further exacerbates public use and enjoyment of the area.

Our organization regularly leads volunteers in conducting stream flow and water quality monitoring in this reach, and we also lead stream field trips and educational workshops to involve the public in stream and watershed restoration. It would be counterproductive to ensure that all have permits or to simply avoid CDFW lands along the river.

*P.O. Box 296 Markleeville, CA 96120  
(530) 694-2327*

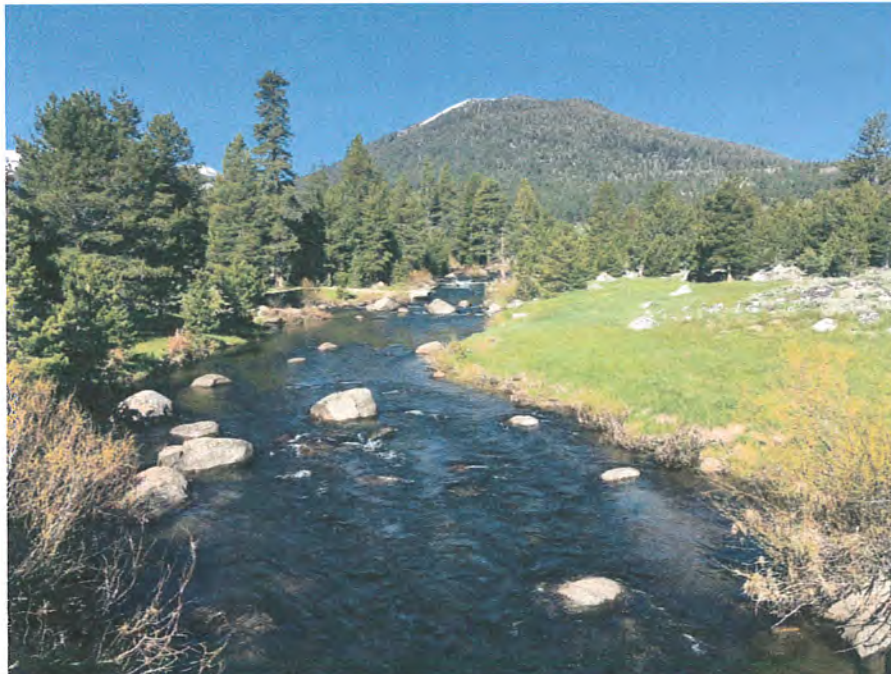


We join the Alpine County Board of Supervisors and the Alpine County Chamber of Commerce in requesting that the Hope Valley Unit be exempt from the Lands Pass requirement. We appreciate you considering the impacts of the Lands Pass Program on our community and on our organization's mission to preserve and enhance the Carson River Watershed.

Sincerely,



Kimra D. McAfee  
Executive Director



Top: ADA accessible  
wheelchair stream-site  
Bottom: Signage for  
Lands Pass at entrance  
to ADA trail to  
stream-site



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**From:** afa@mcn.org  
**Sent:** Thursday, August 23, 2018 5:23 PM  
**To:** FGC; Cornman, Ari@FGC; Wildlife DIRECTOR; Office of the Secretary CNRA  
**Subject:** TEXAS BANS COMMERCIAL HARVEST OF FRESHWATER TURTLES]

Thursday

SEE LINK BELOW - TEXAS OUTLAWS COMMERCIAL HARVEST OF STATE'S FRESHWATER TURTLES.

Can California be far behind?

x  
Eric Mills, coordinator  
ACTION FOR ANIMALS  
Oakland

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[https://www.biologicaldiversity.org/news/press\\_releases/2018/texas-wild-turtle-trapping-08-23-2018.php](https://www.biologicaldiversity.org/news/press_releases/2018/texas-wild-turtle-trapping-08-23-2018.php)

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**From:** Ace Carter  
**Sent:** Thursday, September 20, 2018 6:02 AM  
**To:** Pat McDonell - Editor - WESTERN OUTDOOR NEWS  
**Cc:** Captain Merit McCrae - Saltwater Editor for Western Outdoor News - A veteran Southern California party boat captain - Marine research scientist with the Love Lab at the University of California at Santa Barbara's Marine Science Institute  
**Subject:** HAS ANYONE TESTED THE LOCAL CALIFORNIA KELP LATELY FOR DEADLY AND TOXIC RADIOACTIVE ACCUMULATION..?

HAS ANYONE TESTED THE LOCAL CALIFORNIA KELP LATELY FOR DEADLY AND TOXIC RADIOACTIVE ACCUMULATION..?

FROM THE THREE...

STILL LEAKING FUKUSHIMA AND MELTING DOWN REACTORS..?

HOW ABOUT THE LOCAL CA FISH..? CA LOBSTER..?

IS THE CA SEAFOOD STILL SAFE TO EAT..?

IS IT STILL GETTING WORSE..?

JUST ASKING...

ACE

**California Fish and Game Commission**  
**Staff Report on Staff Time Allocation and Activities**  
*October 10, 2018*

Commission staff time is a tangible and invaluable asset. Especially since the Commission's staff is so small, where and how staff members spend their time is important. This report identifies where Commission staff allocated time to general activity categories (see table; sample tasks for each general category begin on page 3) and specific activities during August and September 2018.

The general allocation table summarizes time across all staff classifications, though some classifications require a greater emphasis on certain task categories than others. For example, advisors can spend 30% or more of their time on special projects due to committee project assignments, while regulatory analysts spend up to 70% of their time on regulatory program tasks.

To capture time spent on program work that is *non-regulatory* in nature, staff created an additional category: *Non-Regulatory Program*. Examples include the effort to track, respond to and process non-regulatory requests; processing California Endangered Species Act petitions; and the work necessary to develop, review and amend commission policies. This is only the second staff report to include the new category and, while the number is not large, it is significant enough to warrant its own category.

Currently, while new staff are being trained, there is an increase in administrative time due to on-the-job training. Related, please note the significant drop in unfilled positions; for comparison, this number was over 20% twice in the last year.

**General Allocation**

<b>Task Category</b>	<b>August Staff Time</b>	<b>September Staff Time</b>
Regulatory Program	11%	16%
Non-Regulatory Program	4%	4%
Commission/Committee Meetings	29%	15%
Legal Matters	4%	6%
External Affairs	7%	10%
Special Projects	13%	11%
Administration	27%	34%
Leave Time	6%	7%
Unfilled Positions	4%	2%
Total Staff Time <sup>1</sup>	105%	105%

<sup>1</sup> Total staff time is greater than 100% due to overtime

## **Activities for August 2018**

- Finished preparations for and conducted one publicly-noticed meeting (August 22-23 FGC)
- Prepared for arrival and began training of new regulatory analyst
- Continued onboarding process and training for seasonal clerk
- Prepared for publicly-noticed WRC meeting
- Participated in Coastal and Ocean Resources Working Group for the Climate Action Team quarterly meeting
- Participated in marine protected areas (MPA) milestones meeting
- Participated in abalone fishery management plan peer review webinar
- Participated in California Hunting and Conservation Coalition meeting
- Participated in MPA Statewide Leadership Team work plan development meetings
- Participated in California Department of Fish and Wildlife (DFW) leadership team meetings
- Assisted California Collaborative Fisheries Research Program in assessing fish populations at the Farallon Islands to evaluate the effectiveness of MPAs
- Participated in Governor Brown's Native American Day planning meetings
- Conducted off-site staff retreat and attended interpretive tour of DFW's Yolo Bypass Wildlife Area

## **Activities for September 2018**

- Conducted one publicly-noticed meeting (September 20 WRC)
- Began preparations for two publicly-noticed meetings (Oct 16 Tribal Committee, Oct 17 Fish and Game Commission)
- Attended and participated in Global Climate Summit in San Francisco
- Participated in meetings with DFW, the California Ocean Protection Council, and the California Ocean Science Trust to collaborate on climate and fishing communities' initiatives
- Began preparations for aquaculture BMPs public meeting
- Continued onboarding process and training for new regulatory analyst
- Participated in Marine Resources Education Program workshop in Santa Cruz
- Participated in interagency working group to address chronic wasting disease
- Jointly staffed (with DFW) a table at the 2018 Native American Day celebration at the State Capitol
- Participated in DFW leadership team meetings
- Participated in public commercial box crab experimental gear permit meeting hosted by DFW
- Participated in quarterly coordination meeting with DFW Regulations Unit
- Participated in aquaculture best management practices (BMPs) working group

## **General Allocation Categories with Sample Tasks**

### ***Regulatory Program***

- Coordinate with DFW to develop timetables and notices
- Prepare and file notices, re-notices, and initial and final statements of reasons
- Prepare administrative records
- Track and respond to public comments
- Consult, research and respond to inquiries from the Office of Administrative Law

### ***Non-Regulatory Program***

- Process and analyze non-regulatory requests
- Develop, review and amend Commission policies
- Research and review adaptive management practices
- Review and process California Endangered Species Act petitions

### ***Commission/Committee Meetings and Support***

- Research and compile subject-specific information
- Review and develop policies
- Develop and distribute meeting agendas and materials
- Agenda and debrief meetings
- Prepare meeting summaries, audio files and voting records
- Research and secure meeting venues
- Develop and distribute after-meeting memos/letters
- Make travel arrangements for staff and commissioners
- Conduct onsite meeting management
- Process submitted meeting materials
- Provide commissioner support (expense claims, office hours, etc.)
- Process and analyze regulation change petitions

### ***Legal Matters***

- Respond to Public Records Act requests
- Process appeals and accusations
- Process requests for permit transfers
- Process kelp and state water bottom leases
- Litigation
- Prepare administrative records

### ***External Affairs***

- Engage and educate legislators, monitor legislation
- Maintain state, federal and tribal government relations
- Correspondence: Respond to public inquiries
- DFW partnership, including joint development of management plans and concepts
- Website maintenance

### ***Special Projects***

- Predator Policy Workgroup
- Fishing from piers and jetties



- Coastal fishing communities
- Fisheries Bycatch Workgroup
- Streamline routine regulatory actions

- Aquaculture best management practices
- Strategic planning

### ***Administration***

- Staff training and professional development
- Correspondence
- Purchases and payments
- Contract management

- Personnel management
- Budget development and tracking
- Health and safety oversight
- Internal processes and procedures
- Document archival

### ***Leave Time***

- Holidays
- Sick leave
- Vacation or annual leave

- Jury duty
- Bereavement
- Professional development (two days)

### ***Unfilled***

- Legal/Regulatory Clerk



**Marine Protected Area  
Statewide Leadership Team  
Work Plan Fiscal Year 18/19 – 20/21**



**October 2018**

# Marine Protected Area Statewide Leadership Team Work Plan Fiscal Year 18/19 – 20/21



## Acknowledgments

This document was a collaborative effort among all members of the Marine Protected Area Statewide Leadership Team (Leadership Team), including the Regional Tribal Representatives. Special thanks to Leadership Team Working Group Members Cassidy Teufel (Coastal Commission), Becky Ota (Fish and Wildlife), Mike Stefanak and Robert Puccinelli (Fish and Wildlife Marine Enforcement Division), Jennifer Mattox (State Lands), Calla Allison (MPA Collaborative Network), Michael Esgro, Tova Handelman, Jenn Eckerle and Cyndi Dawson (Ocean Protection Council), Liz Whiteman (Ocean Science Trust), Katherine Faick and Rebecca Fitzgerald (Water Resources Control Board), Heather Holm (Parks and Recreation), Karen Grimmer and Karen Reyna (West Region National Marine Sanctuaries), Jocelyn Herbert and Kaitilin Gaffney (Resources Legacy Fund), Megan Van Pelt (North Regional Tribal Representative; Natural Resources Director for the Tolowa Dee-ni' Nation), Reno Keoni Franklin (North Central Regional Tribal Representative; Chairman Emeritus, Kashia Pomo Tribe), and Roberta Reyes Cordero (South Regional Tribal Representative; Coastal Band of the Chumash Nation).

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# About This Document

## MPA Statewide Leadership Team

California's Marine Protected Area Statewide Leadership Team (Leadership Team) was convened with the goal of increasing communication and collaboration among agencies, government representatives and partners to ensure the state is effectively managing the statewide marine protected area (MPA) Network. The Leadership Team includes state and federal agencies, tribal government representatives and other partners that play a direct or key support role in management of the network. The MPA Management Program encompasses a wide range of partners and activities that require active collaboration and communication to implement successfully. The state has recognized that no one agency or group has the knowledge, capacity or resources to effectively manage the MPA Network in isolation. The Leadership Team focuses on leveraging resources and breaking down traditional silos to collaboratively address MPA Network management which cuts across jurisdictions and mandates.

## Leadership Team Work Plan

The Leadership Team has identified the following focal areas as key to successful management of MPAs which make up the MPA Management Program: Outreach and Education, Research and Monitoring, Enforcement and Compliance, and Policy and Permitting. Active, sustained engagement in each of these focal areas is integral to achieve the goals of California's MPA Network. This work plan covers a three-year period beginning in 2018 and is a key tool in directing the MPA Management Program and holding members accountable for identified outcomes. This provides a road map for the State and its partners anchored back to the legislation, partnership plan, and other guidance documents related to California's MPA Network. This work plan identifies shared strategic priorities, key actions and outcomes for the MPA Management Program that can be used by government and non-government partners to ensure coordinated progress on achieving the goals of the Marine Life Protection Act.

## Partnerships

The MPA Management Program is rooted in partnerships both inside and outside of government. The creation of a work plan was identified as a key task in "The California Collaborative Approach: Marine Protected Areas Partnership Plan," which outlines the partnerships necessary for the success of the MPA Management Program. Key partners in the implementation of this work plan include all members of the Leadership Team, the Ocean Protection Council (OPC), the California Department of Fish and Wildlife (CDFW), CDFW Law Enforcement Division (LED), Fish and Game Commission (FGC), California Coastal Commission (CCC), California State Lands Commission (CSLC), Department of Parks and Recreation (DPR), State Water Resources Control Board (SWRCB), California Ocean Science Trust (OST), MPA Collaborative Network (CN), West Coast Regional Office of National Marine Sanctuaries (ONMS), and Regional Tribal Representatives from the North, North Central, Central and South Coasts. Additional outside partners are also actively participating in the implementation of this plan and are critical to the full implementation of the plan.

## Executive Summary

In 1999, the California legislature passed the Marine Life Protection Act (MLPA). The MLPA required that the State redesign its existing system of marine protected areas (MPAs) to better support healthy and sustainable marine ecosystems. The fully redesigned statewide MPA Network was completed in 2012 through a science-based and stakeholder-driven process. Throughout the implementation and on-going adaptive management of the MPA Network, the state has been committed to a partnership-based approach. This approach has been solidified in “The California Collaborative Approach: Marine Protected Areas Partnership Plan”<sup>1</sup> and “MLPA Master Plan 2016”<sup>2</sup> and is supported by the MPA Statewide Leadership Team (Leadership Team).

In April 2014, the Leadership Team was convened by the Secretary for Natural Resources as a standing body to ensure communication and collaboration among MPA Network management partners. The Leadership Team is made up of entities and organizations that have significant interests or mandates related to the MPA Network. The California Department of Fish and Wildlife manages the statewide MPA Network and the Fish and Game Commission has regulatory authority related to types of use. The Ocean Protection Council serves as the state’s policy lead for MPAs. The Department of Parks and Recreation is also a designated managing agency for some types of MPAs. The California Coastal Commission, State Lands Commission, and State Water Resources Control Board all have regulatory jurisdictions that overlap with MPA management activities, as does the West Coast Regional Office of National Marine Sanctuaries. The California Ocean Science Trust is a non-profit partner that works in close partnership with state agencies to support science-based decision making related to ocean and coastal management. Regional tribal representatives bring perspectives from California Tribes and Tribal governments in each of the four regions across the state. The Collaborative Network, a consortium of 14 roughly county-based groups, engage local community members and experts in local MPA stewardship and management are represented by their Director. The Resources Legacy Fund is a key state philanthropic funder and partner in the MPA Network and is also a member of the Leadership Team.

The Leadership Team develops three-year work plans to set shared priorities and guide their partnership efforts related to the MPA Management Program, which includes: Outreach & Education; Research & Monitoring; Enforcement & Compliance; and Policy & Permitting. The inaugural Work Plan (2015–2018) was endorsed by the Fish and Game Commission and the Ocean Protection Council in 2015. The Leadership Team has updated the work plan for Fiscal Years 18/19 – 20/21, and this update represents shared consensus priorities among the Leadership Team. These priorities have been developed based on foundational guidance documents such as the MLPA Master Plan 2016 and active dialogue among Leadership Team members, including formal and informal input from stakeholders.

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<sup>1</sup> [http://www.opc.ca.gov/webmaster/ftp/pdf/docs/mpa/APPROVED\\_FINAL\\_MPA\\_Partnership\\_Plan\\_12022014.pdf](http://www.opc.ca.gov/webmaster/ftp/pdf/docs/mpa/APPROVED_FINAL_MPA_Partnership_Plan_12022014.pdf)

<sup>2</sup> <https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan>

### **Outreach & Education**

The Leadership Team recognizes the fundamental importance of improved outreach and education efforts for promoting awareness of the MPA Network among California visitors and residents and cultivating long-term public support and engagement. Updates to the Outreach & Education section of the work plan focus on developing more effective MPA education products, raising the international profile of California's MPA Network to ensure best management practices are used, and improving the consistency of MPA-related messaging with state, federal, tribal, and public partners.

### **Enforcement & Compliance**

The ultimate success of the MPA Network will depend in large part on the degree to which regulations are followed. This requires public understanding of and compliance with MPA regulations paired with consistent enforcement. Updates to the Enforcement & Compliance section of the work plan focus on using technology and other tools to increase enforcement effectiveness and enhancing cooperative enforcement efforts with allied agencies.

### **Research & Monitoring**

Research and monitoring are essential for understanding the ecological and socioeconomic conditions and trends to evaluate the performance of the statewide MPA Network. These activities will also enhance our understanding of the network's contribution to bolstering ecosystem health and resilience in the face of changing ocean conditions. Updates to the Research & Monitoring section of the work plan focus on moving from baseline to long-term monitoring, and providing data and analyses to inform the MPA Network's upcoming 2022 ten-year management review.

### **Policy & Permitting**

The policy and permitting aspects of MPA management are both overarching and fundamental to success. Continued coordination among regulatory agencies is required to maintain a cohesive vision for the MPA Network into the future. Updates to the Policy & Permitting section of the work plan focus on addressing emerging issues in MPA management (i.e. adopting policies at the agency level that clarify other uses in MPAs not specifically addressed in the MLPA).

## List of Acronyms

ASBS – Area of Special Biological Significance  
CCC – California Coastal Commission  
CDAA – California District Attorneys Association  
CEQA – California Environmental Quality Act  
CN – MPA Collaborative Network  
CNRA – California Natural Resources Agency  
DFW – Department of Fish and Wildlife  
DPR – Department of Parks and Recreation  
DTD – Department of Fish and Wildlife Data & Technology Division  
EAGL – Expert Assessment Group for the Green List  
FGC – Fish and Game Commission  
IUCN – International Union for Conservation of Nature  
LED – Department of Fish and Wildlife Law Enforcement Division  
MLPA – Marine Life Protection Act  
MMAIA – Marine Managed Areas Improvement Act  
MPA – Marine Protected Area  
MSLT – MPA Statewide Leadership Team  
MOU – Memorandum of Understanding  
NERR – National Estuarine Research Reserve  
NGO – Nongovernmental Organization  
NMS – National Marine Sanctuary  
OAH – Ocean Acidification and Hypoxia  
OCEO – Department of Fish and Wildlife Office of Communications, Education, and Outreach  
ODFW – Oregon Department of Fish and Wildlife  
ODP – California Natural Resources Agency Open Data Platform  
ONMS – Office of National Marine Sanctuaries  
OPC – California Ocean Protection Council  
OST – Ocean Science Trust  
PORTS – Parks Online Resources for Teachers and Students  
PRC – Parks and Recreation Commission  
RMS – Records Management System  
SAT – OPC Science Advisory Team  
SLC – State Lands Commission  
SMR – State Marine Reserve  
SWRCB – State Water Resources Control Board  
TEK – Traditional Ecological Knowledge

## Focal Area: Outreach and Education

Strategic Priority 1 - Build support and durability of California's MPA network, by raising awareness of the location, conservation goals and effect of MPAs.					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
1.1 Ensure active coordination in the development and distribution of shared messaging and educational resources	1.1.1 Engage MPA Partners (NGOs, tribes, agencies) in discussion on best practices in MPA messaging	MPA partners and the Collaborative Network members play an active role in ongoing development of messaging efforts and strategies	OPC	DFW	ongoing
	1.1.2 Upload existing MPA outreach and education materials to the Open Data Platform	MPA Partners and the Collaborative Network members have online access to MPA messaging and available resources (e.g. brochures, sign templates, etc.) efforts by state, federal and NGO partners. MPA partners and collaborative members can easily contribute to inventory.	DFW	OPC	Jun-2019
	1.1.3 Identify audiences, audience-specific messages and outreach methods	MPA Partners and the Collaborative Network members contribute to and have access to a list of summarized recommendations to draw from that will help them maximize the effectiveness of their outreach to different constituent groups	MPA Statewide Leadership Team^	DFW	Jun-2020
	1.1.4 Identify opportunities to insert messaging into related, non-MPA specific efforts by partners	Leveraging of existing programs will allow for expanded messaging on the value of the MPA network to Californians	OPC	MPA Statewide Leadership Team^	ongoing
1.2 Create MPA-focused outreach materials and host or participate in events	1.2.1 Produce printed outreach materials for high impact locations as needed	Locally specific materials produced, distributed and replenished by at least 10 local MPA collaborative	OPC, DFW	CN	ongoing
		A variety of printed materials are readily available at key locations for consumptive users (harbors, tackle shops, etc.)	DFW	DFW	ongoing
		A variety of printed materials are readily available at key locations for non- consumptive users (aquaria, dive shops, etc.)	DFW	DFW	ongoing
	1.2.2 Produce video/web/phone app based materials	Web and video material produced and distributed by partners and promoted through Leadership Team networks, listservs and social media channels	Outside funders, OPC, DFW	MPA Statewide Leadership Team^	ongoing
	1.2.3 Hold or take part in outreach and education events	Events are promoted through Leadership Team networks, listservs and social media channels	Outside funders, OPC, DFW	MPA Statewide Leadership Team^	ongoing



Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
1.3 Elevate the international profile and collaboration in support of California's MPA Management Program	1.3.1 California's MPA network is recognized as global model for well managed MPA Network and added to the International Union for the Conservation of Nature Green List	International collaborations at the national and sub-national level increase	OPC, DFW	OPC	Mar-19
		Expert Assessment Group (EAGL) and participation in the IUCN process accurately represents geographic and sector-based diversity of stakeholders	OPC, DFW	OPC	Mar-19
Strategic Priority 2 - Create a broad understanding of regulations and increase compliance					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
2.1 Maintain existing signs and respond to emerging needs for regulatory and interpretive signage statewide	2.1.1 Existing signs are maintained and there is a functional mechanism to report sign damage		OPC	OPC	
	2.1.2 Signage is properly permitted, includes approved content including tribal content when appropriate and installed in priority locations	Verification of proper installation of signs including copies of required permits and photographs of installed signs	DFW, OPC	OPC	ongoing
2.2 Continue production of DFW produced and approved outreach materials focused on regulation compliance	2.2.1 Regionally specific materials including maps and booklets with regulations are produced	Outreach materials are reaching coastal communities, visitors and other inland regions of California	DFW	DFW	ongoing
	2.2.2 Produce products on different media (waterproof paper, mobile devices, etc.) to maximize reach and effectiveness	Outreach materials are reaching coastal communities, visitors and other inland regions of California	DFW	DFW	ongoing
Strategic Priority 3 - Develop consistent messaging with state, federal, tribal and public partners					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale

Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
3.1 Create and distribute DFW Partnership Guide	3.1.1 Expand on existing DFW MPA Outreach Quick Reference Guide for partners to add more specific detail on review process, available resources and roles of various partners and agencies. Include in guide requirement to reach out to Native American Heritage Commission with current contact information so partners can get in touch with local tribes to ensure tribal content can be included when feasible.	DFW Partnership Guide is posted widely on the web	OPC, DFW	DFW	Sep-18
3.2 Additional named MPA management entities (DPR and SWRCB), are effectively disseminating MPA messaging	3.2.1 Provide MPA training to staff and docents	OPC will provide trainer and training materials developed in partnership with MPA partners and collaboratives to coastal districts as requested using a "train the trainer" model at DPR and as requested by SWRCB	DPR, OPC, SWRCB	DPR	Dec-20
	3.2.2 Insert MPA messaging into existing outreach campaigns of the Division of Boating and Waterways	MPA messaging is inserted in at least one ongoing Boating and Waterways Outreach Campaign	DPR, OPC	DPR	Dec-19
	3.2.3 Develop new PORTS MPA educational digital resources for K-12 education	DPR will develop at least three MPA digital education packages available online.	DPR, OPC, DFW	DPR	Dec-19
	3.2.4 Expand PORTS MPA Program and park interpretive program offerings on MPA-related topics.	Expand existing PORTS MPA programs, and provide new PORTS and park interpretive MPA programs year-round.	DPR, OPC, DFW	DPR	May-21
	3.2.5 Update and expand accessibility of parks educational materials related to MPAs	DPR will update existing MPA materials as required and translate select MPA published materials into other languages	DPR, OPC, DFW	DPR	Nov-21
3.3 Create and distribute a map of California that includes all protected areas, state, federal and international	3.3.1 Aggregate map layers of MPAs, ASBSs, NERRs, NMSS, Marine Parks, Biosphere reserves, etc. into online interface	Agencies and the public can view the distribution of all protected areas in California in one place for the first time.	MPA Statewide Leadership Team^	ONMS	Dec-19
	3.3.2 Determine the % of state waters that receive full protection (e.g., % coverage of SMRs) and some protection (i.e., % coverage of all other protected areas)	The state and public have a more complete understanding of the % of CA state waters and coastal areas are under what type of protection	MPA Statewide Leadership Team^	DFW	Dec-19

Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
3.4 Office of National Marine Sanctuaries (ONMS) is effectively disseminating MPA messaging and actively engaged in MPA management support activities	3.4.1 Communicate and capture Federal/State jurisdictions in a way that targeted groups can understand complementary nature (i.e. infographic).	Produce and widely distribute product	ONMS	MPA Statewide Leadership Team^	ongoing
	3.4.2 Provide MPA training to staff and docents	Provide trainer and training materials developed in partnership with MPA partners and collaboratives	ONMS, OPC, DFW	DFW	ongoing

^ The Ocean Protection Council administers the MPA Statewide Leadership Team whose members include the Department of Fish and Wildlife, Fish and Game Commission, Coastal Commission, State Lands Commission, Department of Parks and Recreation, State Water Boards, Ocean Science Trust, MPA Collaborative Network and Regional Tribal Representatives

## Focal Area: Policy and Permitting

Strategic Priority 1 - Improve governance of MPA network through adaptive management					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
1.1 Partner agencies identify emerging issues and develop recommendations to address them	1.1.1 MSLT serves as a forum for agency communication about emerging issues identified by staff or constituents that may require regulatory action to address	Members of the MSLT raise emerging issues and elevate request to appropriate staff at partner agencies	OPC	MPA Statewide Leadership Team^	ongoing
1.2 Assess pending agency decisions for potential impacts to MPAs	1.2.1 Partner agencies provide informal input to proposed regulations or significant pending decisions that may affect MPAs early in the process	Proposed new or revised regulations that could affect MPAs are brought to MPA SLT meetings for discussion prior to adoption	Coastal Regulatory Agencies (CCC, SLC, FGC, DFW, DPR, PRC, SWRCB)	OPC	ongoing
1.3 Adopt policies at the OPC and agency level that clarify other uses in MPAs not specifically addressed in the MLPA	1.3.1 Adopt policy and provide guidance on the type of citizen/community science that is most useful for informing the MPA Management Program	State adopts policy that provides a roadmap for the types of attributes (e.g. science advisory panel, testing of data collector, data quality control, etc.) that make a citizen science program's data likely to be used to inform the MPA Management Program	OPC, DFW	OPC	Jul-19
	1.3.2 When adopted clarify how FGC/Tribal co-management vision could be applied to MPAs	Form a MSLT working group and create a white paper outlining how the adopted policy could be applied to MPAs and also address opportunities to apply the policy in existing agency processes and practices	Tribal Representatives	FGC, DFW	Dec-19
	1.3.3 Work towards developing a tribal customary use definition and pathways for how it could be incorporated into MPA Management	Work in tandem with the co-management vision development to develop a broadly supported definition of tribal customary use	Tribal Representatives	FGC, DFW	Dec-21
	1.3.4 Adopt a policy that provides guidance on the types of research restoration and manipulations of species, habitats and ecosystems allowed in all types of MPAs	State adopts a policy well supported by current science and expert opinion that delineates the types of research, restoration and manipulation allowed generally in MPAs of varying protection levels.	OPC, DFW	OPC, FGC	Jul-19
Strategic Priority 2 - Integrate MLPA and MPA network goals, objectives and partnership-based management approach to relevant management documents					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Responsibility	Lead Responsibility	Timescale
	2.1.1 Include MPA content, management and coordination activities in Coastal Commission Strategic Plan update	Document clearly describes objectives and or actions related to the special considerations MPAs should receive when considering permitting activities	CCC	CCC	Dec-19

Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
2.1 Insert relevant content into agency Strategic Plan updates	2.1.2 Coordinate to recommend updates or revisions to the California Ocean Plan during the SWRCB 2019 Triennial Review Process.	Participate in Ocean Plan triennial review stakeholder outreach and public comment opportunities. Provide comments with recommended updates and revisions to the California Ocean Plan which can be considered and prioritized by the SWRCB as a part of the triennial review to ensure the Ocean Plan clearly delineates the special considerations MPAs should receive when considering permitting or regulatory activities.	SWRCB, OPC, CCC	SWRCB	Fall 2019
	2.1.3 Include MPA content in Fish and Game Commission strategic plan update	Document clearly describes the special considering MPAs should receive when considering Commission actions and in providing policy guidance for DFW.	FGC	FGC	19-Dec

**Strategic Priority 3 - Enhanced protection for MPA resources is provided in relevant resource agency authorizations**

Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
3.1 Create tools to improve and highlight inter-agency coordination	3.1.1 Conduct inventory of existing interagency MPA coordination procedures at each agency	Create a memo outlining and summarizing: legislative or policy foundations for special consideration of MPAs, current agency practices, recommendations to improve communication and coordination	SLC, CCC, SWRCB, OPC	OPC	Dec-20
		Create public facing document discussing how agencies coordinate and broadly distribute to relevant stakeholders	OPC	OPC	Dec-20
	3.1.2 Update MLPA Implementation MOU and extend an additional 5 years	All signatures and gathered and document executed	MPA Statewide Leadership Team^	OPC	Dec-20
	3.1.3 Develop interagency coordination guidance document for staff to use at each agency	Building off of white paper from 3.1.1, create internal guidance document for staff at relevant agencies which includes an identified MPA point of contact at each agency	OPC	OPC	Dec-20
	3.1.4 Explore opportunities to evaluate, summarize, and communicate ASBS overlap with MPAs.	Prepare summary paper and consider presentations to Boards and Commissions as appropriate. Consider ASBS and MPA connections in accordance with Section 3.E of the California Ocean Plan.	SWRCB, OPC	SWRCB	2019-2020

**Strategic Priority 4 - Identify marine resource enhancement/mitigation opportunities and impact avoidance strategies within or associated with MPAs**

Key Action	Action Summary	Outcome Required/ Performance Indicator	Responsibility	Lead Responsibility	Timescale
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Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
<b>4.1</b> Use existing regulatory/policy avenues to carry out marine resource enhancement, mitigation, or impact avoidance strategies	<b>4.1.1</b> Identify opportunities for marine resource enhancement, mitigation (e.g. blue carbon), or impact avoidance strategies in current regulatory/policy requirements at participating MLST agencies	Create a document summarizing relevant regulatory/policy requirements relevant to marine resource enhancement, mitigation, or impact avoidance strategies	MPA Statewide Leadership Team^	OPC	Jun-21
	<b>4.1.2</b> Inform relevant agency staff regarding priority opportunities for marine resource enhancement, mitigation (e.g. blue carbon), or impact avoidance strategies in MPA network and prior projects	Where possible, relevant agency staff align this information with the fulfillment of regulatory and policy requirements	MPA Statewide Leadership Team^	OPC	Jun-21
	<b>4.1.3</b> Create guidance document summarizing existing CEQA procedures and messaging related to MPAs	Develop guidance document for agencies that includes broadly applicable suggestions on avoiding and minimizing MPA impacts through CEQA review	MPA Statewide Leadership Team^	OPC	Jun-21
	<b>4.1.4</b> Consider areas to nominate, or nominate areas, for State Water Quality Protected Area designation in accordance with the requirements in Section 3.E. and Appendix IV of the California Ocean Plan and per SWRCB direction per Resolution 2010-0057* to develop recommendations for new SWQPAs.	Regional Water Board consideration of nominated areas, and State Water Board designation as appropriate, in accordance with the requirements in Section 3.E. and Appendix IV of the California Ocean Plan.	SWRCB, OPC	SWRCB	Dec-21

\*[https://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/resolutions/2010/rs2010\\_0057.pdf](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2010/rs2010_0057.pdf)

^ The Ocean Protection Council administers the MPA Statewide Leadership Team whose members include the Department of Fish and Wildlife, Fish and Game Commission, Coastal Commission, State Lands Commission, Department of Parks and Recreation, State Water Boards, Ocean Science Trust, MPA Collaborative Network and Regional Tribal Representatives

## Focal Area: Enforcement and Compliance

Strategic Priority 1 - Increase capacity and effectiveness of enforcement					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
1.1 Use technology and other tools to increase cost-effectiveness and efficiency of enforcement resources in the field	1.1.1 Develop statewide Records Management System (RMS) to collect, organize and track citation data	Implement a RMS to enhance DFWs ability to collect, store and query law enforcement data. Annual report submitted at September MPA Milestones meeting	DFW	LED	12/1/2018 system launch and ongoing
	1.1.2 Identify enforcement priority areas based on the potential for resource impact, level of use, and potential for violations	Records Management System will allow accurate analysis on the enforcement efforts/needs on specific MPAs; regular uptake of MPA Watch reports may also help inform enforcement needs	DFW	LED	ongoing
	1.1.3 Explore existing and emerging technologies and surveillance systems to enhance MPA enforcement	Assess technologies that are available and evaluate and employ those with potential to enhance MPA enforcement	DFW	LED	ongoing
1.2 Maintain and enhance cooperative enforcement efforts with other agencies (Master Plan)	1.2.1 Promote interagency cooperation and collaboration for more effective MPA enforcement	Develop and facilitate collaborative programs for statewide MPA enforcement New round of enforcement trainings re MPA rules, updated regulations, and AB 2369 if passed. Be sure to include DFW, allied agencies with cite authority, tribes, and local DA's; Update enforcement training manuals and host refresher trainings for allied agencies	LED, CN	CN	Jun-20
1.3 Increase judicial system and enforcement officers awareness of MPA regulations and understanding of the value of MPAs (e.g. DAs and judges)	1.3.1 Develop educational tools specifically for judges and DAs	Develop MPA enforcement video and distribute widely to court and enforcement officers Design and facilitate MPA training to be provided to the judicial system of all CA coastal counties. Meet with individual DA's to encourage designation of wildlife/marine specialist. Ensure tribes are consulted and relevant content on legal, political, cultural and historical context is included.	LED/CDAA, CN/CDFW	CN	2020
	1.3.2 Hold Enforcement Trainings for court officers	Create training and workplace resources that can be used in the MPA judicial process.	LED/CDAA	LED	2020

Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
<b>1.4</b> Actively coordinate with private companies who produce products that display or convey information to the public MPA regulations (e.g. GPS layers, phone applications, etc.)	<b>1.4.1</b> Actively monitoring products to ensure proper information is being disseminated	MPAs depicted on most commonly used GPS systems are accurate	LED/DTD/OCEO	DFW	ongoing
<b>1.5</b> Plan and Conduct a DFW Law Enforcement Division Needs Assessment to determine if they have the resources to effectively enforce MPA regulations.	<b>1.5.1</b> Identify and address LED personnel needs for MPA enforcement.	Prepare a document identifying appropriate staffing levels and equipment requirements for existing and anticipated future needs including a section on recruiting officers from diverse communities. Some tribes are interested in supporting enforcement efforts through existing tribal authority and/or through arrangements with local sheriffs. See e.g., Canadian Guardian Watchmen program.	DFW, Interested Tribes	LED	2021
	<b>1.5.2</b> Identify and address LED equipment needs for MPA enforcement.	Identify funding source to purchase items needed for MPA enforcement	DFW, OPC	LED	2019 Purchases by 2021
<b>Strategic Priority 2 - Increase coordination and improve capacity to conduct MPA compliance monitoring/assessment</b>					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
<b>2.1</b> Track allied agency enforcement actions in MPAs	<b>2.1.1</b> Develop and distribute survey for allied agencies to easily report contacts and cites on a quarterly basis	Summaries of allied agency contributions to MPA compliance	CN	CN	2021



## Focal Area: Research and Monitoring

Strategic Priority 1 - Develop the format, process and content for the 2022 Ten-Year Management Review					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
1.1 Engage with key partners like Oregon Department of Fish and Wildlife (ODFW), legislators and Fish and Game Commissioners to develop a format for management review	1.1.1 Hold continued meetings with ODFW at least annually to continue to coordinate on analyses and format	At least one in-person annual meeting, that produces meeting notes and other products to assist with 2022 Review process and format	OPC, DFW	DFW	ongoing
	1.1.2 Outreach to commissioners and legislators about expectations and format of review	Meet at least 4 coastal legislators annually to brief them on 2022 Review preparations.	OPC,DFW	OPC,DFW	ongoing
	1.1.3 Outreach to commissioners about expectations and format of review	Have at least one briefing with Fish and Game Commission by 2020 to get feedback on the 2022 review	FGC,OPC, DFW	FGC	ongoing
	1.2.1 Convene SAT Working Group to develop recommendations for the format, types of analyses and summaries that should be prepared	SAT Working Group creates report with recommendations based on the best-science available for the types of analyses and synthetic products that would be most useful to assess MPA Network performance in relation to the goals of the Marine Life Protection Act	OPC, OST, DFW	OST	Dec-19
Strategic Priority 2 - Strengthen alignment of MPA Monitoring Program with other state resource management priorities					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
2.1 Align marine and water quality protected area (i.e., ASBSs, MPAs) monitoring programs to leverage resources, capacity and expertise across mandates and jurisdictions	2.1.1 Continue and improve coordination between Southern California Coastal Water Research Project BIGHT Monitoring Program and MPA Monitoring Program	Create document that lays out the two programs goals and objectives with a focus on identifying areas of alignment and opportunity for increased collaboration	DFW, SWRCB, OPC	OPC	2019
		Create map product that identifies water quality areas of concern in or adjacent to MPAs based on long-term BIGHT monitoring,	DFW, SWRCB, OPC	OPC	2019
	2.1.2 Review ASBS and MPA monitoring plans, reports and/or work plans to identify overlaps in program components	Map generated that illustrates where ASBSs and MPAs are co-located and where data for each monitoring program has been collected	OST, SWRCB	OPC	Dec-19
		Document created that identifies overlaps in requirements, methodology, funding sources, and personnel	SWRCB, OPC	OPC	Dec-19
	2.1.3 Work with Water Monitoring Council to develop unified interagency strategy to identify overlaps in regulatory National Pollutant Discharge Elimination System (NPDES) and MPA monitoring.	A document created that identifies overlaps in requirements, methodology, funding sources, and personnel	SWRCB, OPC	OPC	Dec-20
		All baseline data displays properly including previewing functionality	DFW, OPC	OST	Dec-19

Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
2.2 Populate and maintain the CNRA Open Data Portal (data.cnra.ca.gov) with all relevant MPA data that can inform performance evaluations	2.2.1 Finish transition of all baseline data to ODP	MPA monitoring data and results are easily accessible and curated for long-term, public accessibility	DFW, OPC	DFW, OPC	ongoing
	2.2.2 Work with contractor to build comprehensive data governance for ODP	Clear quality standards are established and widely published	DFW, OPC	OPC	Jun-20
	2.2.3 Become a data node for Data One and establish connections to other relevant data repositories	Relevant data is displayed on Data One and ODP and other relevant data repositories	DFW, OPC	OPC	Jun-20
	2.2.4 Develop compelling visualizations and a map interface	Map of biological, physical, chemical and human use monitoring assets is completed	DFW, OPC	DFW, OPC	Dec-20
		Map interface that displays spatial and temporal coverage of available data	DFW, OPC	OPC	ongoing
2.3 Diversify monitoring collaborations and including multiple sources of knowledge (agency, academic, local, traditional, community/citizen, to broaden participation and deepen understanding of ocean health	2.3.1 Develop an approach for integrating multiple sources of knowledge (e.g., traditional ecological knowledge (TEK), ecological data, socioeconomic data)	A guiding document is produced that provides a framework for integrating TEK research with other sources of knowledge into long-term monitoring statewide	Tribal Reps, DFW,OPC	OPC	Dec-20
		Data use guidelines are produced for TEK and are applied long-term MPA monitoring activities	Tribal Reps, DFW, OPC	OPC	Dec-20
	2.3.2 Develop an inventory of relevant community/citizen science monitoring programs	Extent and capacity of existing community/citizen science and tribal-lead monitoring programs is summarized in map product or document	Tribal Reps, DFW, OST, OPC	OPC	Dec-19
2.4 Pursue MPA research and monitoring activities that have the potential to inform and/or align multiple management mandates and priorities	2.4.1 Prioritize and align data collection and approaches that can inform both 1) essential fisheries information that is useful for stock assessments and fisheries management decisions, and 2) ecological information that is useful to assess condition and trends of marine ecosystems	Key indicators, metrics, and datasets are identified that can inform both fisheries and MPA management at multiple scales	DFW, OST, OPC	DFW	ongoing
		Focal MPAs are identified where data collection could inform both MPA and fisheries management at multiple scales	DFW, OST, OPC	DFW	ongoing
	2.4.2 Incorporate approaches within <i>Tracking the Impacts of Changing Ocean Chemistry to Inform Decisions and emerging products from</i> the West Coast Ocean Acidification and Hypoxia (OAH) Science Panel and Task Force.	MPA and OAH monitoring activities are geographically and temporally aligned.	OPC, OST	OPC	ongoing
	2.4.3 Engage regional experts to explore approaches for assessing the impacts of climate change on ocean ecosystems and resources and evaluating how a changing climate will alter the MPA network’s ability to meet MPA management and policy goals	Long-term MPA monitoring produces data that contributes to our understanding of climate change impacts.	DFW, OPC, OST	OPC	ongoing
		MPA monitoring and network assessment plan for climate change impacts	DFW, OPC, OST	OPC	ongoing
Strategic Priority 3 - Implement MPA Monitoring Program Action Plan					
Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale

Key Action	Action Summary	Outcome Required/ Performance Indicator	Key Facilitator/Funder	Lead Responsibility	Timescale
<b>3.1</b> Action Plan adopted by Fish and Game Commission and OPC	<b>3.1.1</b> Peer- and public-reviewed document brought to Fish and Game Commission	Action Plan endorsed/adopted	DFW, OPC, FGC	DFW, FGC	Oct-18
	<b>3.1.2</b> Peer- and public-reviewed document brought to Ocean Protection Council	Action Plan endorsed/adopted	DFW, OPC	DFW, OPC	Oct-18
<b>3.2</b> MPA Monitoring Program Phase 2 implemented via a competitive process	<b>3.2.1</b> Priority metrics, sites (reference and MPA), habitats and species are monitored to inform 2020 Ten-Year Management Review	Projects selected using competitive peer review process and approved by OPC	DFW, OPC	DFW, OPC	Feb-19
		Monitoring and required analyses funded and underway in priority habitats through 2021	DFW, OPC	DFW, OPC	May-19 and ongoing
<b>3.3</b> Ongoing reporting of results	<b>3.3.1</b> Stakeholders receive timely and effective reporting of results in an easy to understand format	At least annually there is a concerted multi-platform (e.g. digital and print media, conferences, workshops etc.) effort to share emerging results and on-going activities of the MPA Monitoring Program	MPA Statewide Leadership Team^	OPC	ongoing
	<b>3.3.2</b> Decision makers receive timely and effective reporting of results in easy to understand format	Conduct at least 6 briefing annual to share emerging results and on-going activities of the MPA Monitoring Program	MPA Statewide Leadership Team^	OPC	ongoing

^ The Ocean Protection Council administers the MPA Statewide Leadership Team whose members include the Department of Fish and Wildlife, Fish and Game Commission, Coastal Commission, State Lands Commission, Department of Parks and Recreation, State Water Boards, Ocean Science Trust, MPA Collaborative Network and Regional Tribal Representatives

August 20, 2018

RE: Marine Protected Area Statewide Leadership Team Work Plan (FY 18/19 – 20/21)

Dear Ocean Protection Council Members:

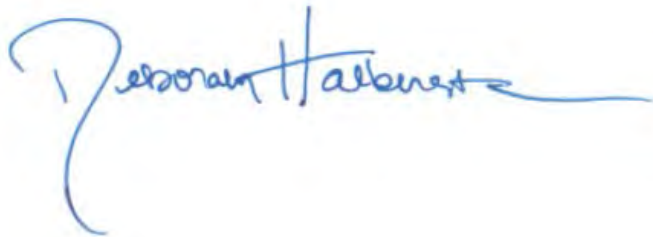
We the undersigned are members of the Marine Protected Area Statewide Leadership Team and we are writing to express strong support for the updated MPA Statewide Leadership Work Plan FY 18/19 – 20/21. The Work Plan (Work Plan) outlines the shared consensus priorities of the Leadership Team for the MPA Management Program. The Leadership Team was formed to ensure coordinated decision making related to the management of the state's globally significant MPA network. The Work Plan creates a road map for state and non-state partners to encourage collaboration and the efficient use of existing capacity and resources.

The priorities reflected in the document are grounded in core policy documents including the 2016 Marine Life Protection Act (MLPA) Master Plan, the MPA Partnership Plan, the MPA Monitoring Program Action Plan, and the Ocean Protection Council Once-Through Cooling Program Guidelines. In addition, Leadership Team members have ensured that priorities from stakeholders they have received, through both formal and informal processes, were part of the development of the document. The Work Plan defines a lead entity and key tasks for each of the four focal areas of the MPA Management Program: outreach and education; enforcement and compliance; research and monitoring; policy and permitting.

The Work Plan ensures we maintain momentum, address emerging needs and keep California's MPA network on track to meet the goals of the MLPA. Marine protected areas must be well managed to achieve their ecological goals and the work plan sets out a clear path to ensure effective adaptive management. Your continued support for the work of the Leadership Team helps maintain California's globally leadership in MPA management and establishes a clear road map for continued success at meeting the goals of the MLPA.

Sincerely,  
The Marine Protected Area Statewide Leadership Team

1416 Ninth Street, Suite 1311, Sacramento, CA 95814 Ph. 916.653.5656 Fax 916.653.8102 <http://resources.ca.gov>



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Deborah Halberstadt  
Deputy Secretary for Ocean and Coastal Policy

8/23/18

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Date

August 20, 2018



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Charlton H. Bonham  
Director, California Department of Fish and Wildlife

9/25/18

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Date

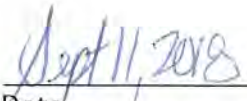
August 20, 2018

  
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Melissa Miller-Henson  
Acting Executive Director, California Fish and Game Commission

10/4/18  
Date

August 20, 2018

  
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Lisa Mangat  
Director, California Department of Parks and Recreation

  
\_\_\_\_\_  
Date

August 20, 2018





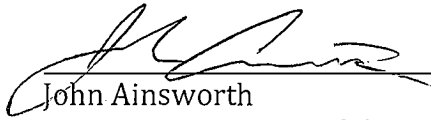
Eileen Sobeck

Executive Director, State Water Resources Control Board

8/12/18

Date

August 20, 2018



John Ainsworth  
Executive Director, California Coastal Commission

9-20-2018

Date

August 20, 2018




Jennifer Lucchesi  
Executive Officer, California State Lands Commission

9/17/2018

Date

August 20, 2018

  
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William Douros  
West Coast Regional Director, Office of National Marine Sanctuaries  
National Oceanic and Atmospheric Administration

Sept. 18, 2018  
Date

August 20, 2018



# Department of Fish & Wildlife Final 2018 Legislative Report

**October 2018**  
(as of October 1, 2018)

**AB 424**     **(McCarty D) Possession of a firearm in a school zone.**

**Introduced:** 2/9/2017

**Last Amend:** 8/30/2017

**Status:** 10/14/2017-Approved by the Governor. Chaptered by Secretary of State - Chapter 779, Statutes of 2017.

**Location:** 10/14/2017-A. CHAPTERED

**Summary:** Would delete the authority of a school district superintendent, his or her designee, or equivalent school authority to provide written permission for a person to possess a firearm within a school zone. By expanding the scope of a crime, the bill would create a state-mandated local program. The bill would exempt from that crime the activities of a program involving shooting sports or activities that are sanctioned by a school, school district, college, university, or other governing body of the institution, as specified, and the activities of a certified hunter education program, as specified. The bill would make other conforming changes to related provisions.

**AB 474**     **(Garcia, Eduardo D) Hazardous waste: spent brine solutions.**

**Introduced:** 2/13/2017

**Last Amend:** 8/21/2017

**Status:** 10/15/2017-Approved by the Governor. Chaptered by Secretary of State - Chapter 840, Statutes of 2017.

**Location:** 10/15/2017-A. CHAPTERED

**Summary:** Current law exempts from certain requirements of the Hazardous Waste Control Law wastes from the extraction, beneficiation, or processing of ores and minerals that are not subject to regulation under the federal Resource Conservation and Recovery Act of 1976, including spent brine solutions used to produce geothermal energy that meet specified requirements. This bill would exempt spent brine solutions that are byproducts of the treatment of groundwater to meet California drinking water standards from those same requirements if certain conditions are met, including that the spent brine solutions are transferred for dewatering via a closed piping system to lined surface impoundments regulated by the California regional water quality control boards.

**AB 661**     **(Mayes R) Magnesia Spring Ecological Reserve: Mirage Trail.**

**Introduced:** 2/14/2017

**Last Amend:** 7/3/2017

**Status:** 9/27/2017-Approved by the Governor. Chaptered by Secretary of State - Chapter 315, Statutes of 2017.

**Location:** 9/27/2017-A. CHAPTERED

**Summary:** Current law requires, until January 1, 2018, that the Mirage Trail within the Magnesia Spring Ecological Reserve be open 9 months of the year during the months of May to January, inclusive, and closed for 3 months during the months of February to April, inclusive, to recreational hiking if the Fish and Game Commission determines that specified conditions relating to providing funding and ensuring the proper use and monitoring of the reserve are met. This bill would require the commission, beginning January 1, 2020, and by January 1 every 2 years thereafter, at a public hearing, to assess compliance with the requirements of those provisions and post its findings and any recommendations on its Internet Web site.

- [AB 707](#) (Aguiar-Curry D) Clear Lake.**  
**Introduced:** 2/15/2017  
**Last Amend:** 7/3/2017  
**Status:** 10/15/2017-Approved by the Governor. Chaptered by Secretary of State - Chapter 842, Statutes of 2017.  
**Location:** 10/15/2017-A. CHAPTERED  
**Summary:** Would establish in the Natural Resources Agency, the Blue Ribbon Committee for the Rehabilitation of Clear Lake. The bill would require the committee to consist of specified persons, including the Secretary of the Natural Resources Agency, or his or her designee. The bill would require the committee to meet quarterly for the purposes of discussion, reviewing research, planning, and providing oversight regarding the health of Clear Lake. The bill would require the committee to hold 2 meetings per year in the County of Lake.
- [AB 718](#) (Frazier D) Mosquito abatement and vector control districts: managed wetland habitat: memoranda of understanding.**  
**Introduced:** 2/15/2017  
**Last Amend:** 9/8/2017  
**Status:** 10/3/2017-Approved by the Governor. Chaptered by Secretary of State - Chapter 446, Statutes of 2017.  
**Location:** 10/3/2017-A. CHAPTERED  
**Summary:** Current law provides for the formation of mosquito abatement and vector control districts, and prescribes the powers, functions, and duties of those districts, as specified. This bill would authorize a private landowner whose property includes managed wetland habitat, as defined, located within the boundaries of a district and meets other criteria to initiate the opportunity to enter into a memorandum of understanding with the district to establish a process to implement best management practices with regard to the managed wetland habitat.
- [AB 1031](#) (Waldron R) Personal income taxes: voluntary contributions: Rare and Endangered Species Preservation Program: Native California Wildlife Rehabilitation Voluntary Tax Contribution Fund.**  
**Introduced:** 2/16/2017  
**Last Amend:** 8/24/2017  
**Status:** 10/5/2017-Approved by the Governor. Chaptered by Secretary of State - Chapter 504, Statutes of 2017.  
**Location:** 10/5/2017-A. CHAPTERED  
**Summary:** Current law allows an individual taxpayer to contribute amounts in excess of his or her personal income tax liability for the support of specified funds and accounts, including among others, to the Endangered and Rare Fish, Wildlife, and Plant Species Conservation and Enhancement Account. Current law authorizes contributions to be made to this account pursuant to these provisions until January 1, 2018, or until an earlier date if specified minimum contributions are not received. Current law requires all moneys contributed to this account pursuant to these provisions to be allocated, upon appropriation by the Legislature, to the Franchise Tax Board and the Controller for the costs of collection and administration of the funds, and to the Department of Fish and Wildlife for specified purposes. This bill would authorize contributions to be made to this account pursuant to these provisions until January 1, 2025, or until an earlier date if the Franchise Tax Board determines that the amount of contributions estimated to be received during a calendar year will not at least equal the minimum contribution amount of \$250,000.
- [AB 1133](#) (Dahle R) California Endangered Species Act: experimental populations.**  
**Introduced:** 2/17/2017  
**Last Amend:** 8/21/2017  
**Status:** 9/25/2017-Approved by the Governor. Chaptered by Secretary of State - Chapter 276, Statutes of 2017.

**Location:** 9/25/2017-A. CHAPTERED

**Summary:** Would provide that a person who obtains a federal enhancement of survival permit that authorizes the take of endangered or threatened species that is also listed as endangered, threatened, or candidate under CESA, in order to establish or maintain an experimental population of the species pursuant to FESA, requires no further authorization or approval under CESA for that person to take that species as identified in, and in accordance with, the enhancement of survival permit, if specified requirements are met. These provisions would remain in effect only until the effective date of an amendment to FESA that alters the requirements for issuing an enhancement of survival permit.

**AB 1197 (Limón D) Oil spill contingency plans: spill management teams.**

**Introduced:** 2/17/2017

**Last Amend:** 8/21/2017

**Status:** 10/8/2017-Approved by the Governor. Chaptered by Secretary of State - Chapter 584, Statutes of 2017.

**Location:** 10/8/2017-A. CHAPTERED

**Summary:** Current law provides for the rating of oil spill response organizations (OSROs) by the administrator pursuant to specified provisions and requires an oil spill contingency plan to identify at least one rated OSRO for each rating level established pursuant to those provisions. This bill would no longer require an oil spill contingency plan to identify at least one rated OSRO for each rating level and would instead require the plan to identify at least one OSRO rated pursuant to those provisions, and would authorize an owner or operator to rely on its own response equipment and personnel, if they have been rated by the administrator, as specified.

**AB 1228 (Bloom D) Marine fisheries: experimental fishing permits.**

**Introduced:** 2/17/2017

**Last Amend:** 7/17/2017

**Status:** 1/12/2018-Stricken from file.

**Location:** 10/7/2017-A. VETOED

**Summary:** Would authorize the Fish and Game Commission to approve experimental fishing permits to be issued by the Department of Fish and Wildlife for specified purposes that would authorize commercial or recreational marine fishing activity otherwise prohibited by the Fish and Game Code or regulations adopted pursuant to that code, subject to certain requirements, including a requirement that activities conducted under the permit be consistent with specified policies enacted as part of the Marine Life Management Act of 1998 and any applicable fishery management plan and a requirement that the permit be subject to certain commission conditions.

**AB 1282 (Mullin D) Transportation Permitting Task Force.**

**Introduced:** 2/17/2017

**Last Amend:** 6/29/2017

**Status:** 10/10/2017-Approved by the Governor. Chaptered by Secretary of State - Chapter 643, Statutes of 2017.

**Location:** 10/10/2017-A. CHAPTERED

**Summary:** Would require, by April 1, 2018, the Secretary of Transportation, in consultation with the Secretary of the Natural Resources Agency, to establish a Transportation Permitting Taskforce consisting of representatives from specified entities to develop a process for early engagement for all parties in the development of transportation projects, establish reasonable deadlines for permit approvals, and provide for greater certainty of permit approval requirements. The bill would require the Secretary of Transportation, by December 1, 2019, to prepare and submit to the relevant policy and fiscal committees of the Legislature a report of findings based on the efforts of the taskforce.

**AB 1337 (Patterson R) Fish and Game Commission: meetings and hearings: live broadcast.**

**Introduced:** 2/17/2017

**Status:** 8/15/2018-Last day to consider Governor's veto pursuant to Joint Rule 58.5.

**Location:** 5/14/2018-A. VETOED

**Summary:** Would require the Fish and Game Commission to provide a live video broadcast on its Internet Web site of every commission meeting or hearing that is open and public and every meeting or hearing conducted by the marine resources committee, wildlife resources committee, or tribal committee that is open and public.

**AB 1479 (Bonta D) Public records: custodian of records: civil penalties.**

**Introduced:** 2/17/2017

**Last Amend:** 9/1/2017

**Status:** 1/12/2018-Stricken from file.

**Location:** 10/13/2017-A. VETOED

**Summary:** Would, until January 1, 2023, require public agencies to designate a person or persons, or office or offices to act as the agency's custodian of records who is responsible for responding to any request made pursuant to the California Public Records Act and any inquiry from the public about a decision by the agency to deny a request for records. The bill also would make other conforming changes. Because the bill would require local agencies to perform additional duties, the bill would impose a state-mandated local program.

**AB 1573 (Bloom D) Marine fisheries: experimental fishing permits.**

**Introduced:** 2/17/2017

**Last Amend:** 8/17/2018

**Status:** 9/18/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 477, Statutes of 2018.

**Location:** 9/18/2018-A. CHAPTERED

**Summary:** Current law requires the Fish and Game Commission to encourage the development of new types of commercial fishing gear and new methods of using existing commercial fishing gear by approving permits, known as experimental gear permits, to be issued by the Department of Fish and Wildlife, consistent with specified policies, for that development or use, subject to certain restrictions. This bill would repeal these experimental gear permit provisions and instead would authorize the commission to approve experimental fishing permits to be issued by the department for specified purposes that would authorize commercial or recreational marine fishing activity otherwise prohibited by the Fish and Game Code or regulations adopted pursuant to that code.

**AB 1804 (Berman D) California Environmental Quality Act: exemption: residential or mixed-use housing projects.**

**Introduced:** 1/10/2018

**Last Amend:** 8/24/2018

**Status:** 9/22/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 670, Statutes of 2018.

**Location:** 9/22/2018-A. CHAPTERED

**Summary:** Would, until January 1, 2025, exempt from CEQA residential or mixed-use housing projects, as defined, located in unincorporated areas of a county meeting certain requirements. The bill would require a lead agency, if the lead agency determines that a residential or mixed-use housing project is exempt from CEQA, to file a notice of exemption with the Office of Planning and Research and the county clerk in the county in which the project is located. Because a lead agency would be required to determine the applicability of this exemption and to file a notice with the office and the county clerk, this bill would impose a state-mandated local program.

**AB 1945 (Garcia, Eduardo D) California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund: investment plan.**

**Introduced:** 1/29/2018

**Last Amend:** 8/24/2018



**Status:** 9/27/2018-Vetoed by Governor.

**Location:** 9/27/2018-A. VETOED

**Summary:** Would, beginning July 1, 2019, require state agencies administering competitive grant programs that allocate moneys from the Greenhouse Gas Reduction Fund to give specified communities preferential points during grant application scoring for programs intended to improve air quality and to include a specified application timeline and to allow applicants from the Counties of Imperial and San Diego to include daytime population numbers in grant applications.

**AB 2151 (Gray D) Hunting: reduced-price antelope, elk, bear, and bighorn sheep tags: resident junior hunters.**

**Introduced:** 2/12/2018

**Last Amend:** 6/14/2018

**Status:** 9/7/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 295, Statutes of 2018.

**Location:** 9/7/2018-A. CHAPTERED

**Summary:** Would, beginning July 1, 2019, and until July 1, 2025, reduce the fee required to obtain an antelope, elk, bear, or bighorn sheep tag to \$20, as adjusted pursuant to the specified index, for a person who is a resident of the state and who possesses a junior hunting license. The bill would require the department to prepare a report to the Legislature no later than July 1, 2024, on the effect of these reduced-price tags on rates of participation by junior hunters, the Big Game Management Account, and the Fish and Game Preservation Fund. The bill would make other related and conforming changes.

**AB 2175 (Aguiar-Curry D) Vessels: removal.**

**Introduced:** 2/12/2018

**Last Amend:** 6/11/2018

**Status:** 9/11/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 341, Statutes of 2018.

**Location:** 9/11/2018-A. CHAPTERED

**Summary:** This bill would authorize a peace officer or marine safety officer, while engaged in the performance of official duties, to remove a vessel from, and, if necessary, store a vessel removed from, public property within the territorial limits in which the officer may act, under specified circumstances relating to the use of the vessel in the commission of a crime. The bill would authorize a court to order a person convicted of a crime involving the use of a vessel that is removed and impounded pursuant to these provisions to pay the costs of towing and storage of the vessel and any related administrative costs imposed in connection with the removal, impoundment, storage, or release of the vessel.

**AB 2192 (Stone, Mark D) State-funded research: grant requirements.**

**Introduced:** 2/12/2018

**Last Amend:** 6/21/2018

**Status:** 9/7/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 296, Statutes of 2018.

**Location:** 9/7/2018-A. CHAPTERED

**Summary:** Would expand the scope of the California Taxpayer Access to Publicly Funded Research Act to include research grants provided in whole or in part by any state agency within the executive branch, as specified. The bill would specify that the public availability requirements apply only to peer-reviewed manuscripts accepted for publication. The bill would require the grantee to ensure that the peer-reviewed manuscript is available to the state agency on an appropriate publicly accessible repository approved by that agency and would eliminate the references to the California Digital Open Source Library. The bill would also extend the operation of these provisions indefinitely.

**AB 2222 (Quirk D) Crime prevention and investigation: informational databases: firearms.**

**Introduced:** 2/12/2018

**Last Amend:** 8/24/2018

**Status:** 9/28/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 864, Statutes of 2018.

**Location:** 9/28/2018-A. CHAPTERED

**Summary:** Current law directs police and sheriffs' departments to submit the description of serialized or uniquely inscribed nonserialized property that has been reported stolen, lost, found, recovered, or under observation, directly to an automated Department of Justice system. Current law requires that any information entered into the Department of Justice system regarding a firearm remain in the system until the firearm is found, recovered, no longer under observation, or the record is deemed to have been entered in error. Current law also requires the costs resulting from this requirement to be reimbursed from funds other than those collected from specified fees relating to firearms. This bill would extend this firearms reporting requirement to all law enforcement agencies in the state, as defined, and would require that the report be entered within 7 days of the agency being notified of the precipitating event.

**AB 2252 (Limón D) State grants: state grant administrator.**

**Introduced:** 2/13/2018

**Last Amend:** 8/17/2018

**Status:** 9/10/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 318, Statutes of 2018.

**Location:** 9/10/2018-A. CHAPTERED

**Summary:** Would enact the Grant Information Act of 2018. The bill would require the California State Library, on or before July 1, 2020, to create a funding opportunities Internet Web portal that provides a centralized location for grant seekers to find state grant opportunities. The bill would additionally require each state agency, on or before July 1, 2020, to register every grant the state agency administers with the California State Library prior to commencing a solicitation or award process for distribution of the grant, as specified. The bill would require each state agency, on or before July 1, 2020, to provide for the acceptance of electronic applications for any grant administered by the state agency, as appropriate.

**AB 2348 (Aguilar-Curry D) California Winter Rice Habitat Incentive Program.**

**Introduced:** 2/13/2018

**Last Amend:** 8/24/2018

**Status:** 9/21/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 649, Statutes of 2018.

**Location:** 9/21/2018-A. CHAPTERED

**Summary:** Current law authorizes the Director of Fish and Wildlife, pursuant to the California Waterfowl Habitat Program, to enter into land use contracts for an initial term of 10 years to conserve waterfowl and waterfowl habitat with nonpublic entities that are owners of record or with lessees of land determined by the director to be important for the conservation of waterfowl, subject to the appropriation of money for that purpose. Under those contracts, the use of the land is restricted for waterfowl conservation and habitat purposes and the Department of Fish and Wildlife makes payments for that restriction. This bill would establish a similar program, to be known as the California Winter Rice Habitat Incentive Program, to authorize the director to enter into contracts for an initial term of 3 years with nonpublic entities that are owners of record or with lessees of productive agricultural rice lands that are winter-flooded and that are determined by the director to be important for the conservation of waterfowl.

**AB 2369 (Gonzalez Fletcher D) Fishing: marine protected areas: violations.**

**Introduced:** 2/14/2018

**Last Amend:** 6/27/2018

**Status:** 8/24/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 189, Statutes of 2018.

**Location:** 8/24/2018-A. CHAPTERED

**Summary:** Under the The Marine Life Protection Act, the Fish and Game Commission is authorized to regulate commercial and recreational fishing and any other taking of marine species in marine protected areas, but the taking of a marine species in a marine life reserve, a type of marine protected area, is prohibited for any purpose, including recreational and commercial fishing, except as authorized by the commission for scientific purposes. This bill would expand the applicability of a misdemeanor for a violation of this regulation from a person who holds a commercial passenger fishing boat license to a person who is operating a boat or vessel licensed as a commercial passenger fishing boat at the time of the violation.

**AB 2421 (Stone, Mark D) Wildlife Conservation Board: Monarch Butterfly and Pollinator Rescue Program.**

**Introduced:** 2/14/2018

**Last Amend:** 7/3/2018

**Status:** 9/26/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 760, Statutes of 2018.

**Location:** 9/26/2018-A. CHAPTERED

**Summary:** Would establish the Monarch Butterfly and Pollinator Rescue Program, to be administered by the Wildlife Conservation Board, for the purpose of recovering and sustaining populations of monarch butterflies and other pollinators. To achieve these purposes, the bill would authorize the board to provide grants and technical assistance, as prescribed. The bill would require the board to develop and adopt project selection and evaluation guidelines, in coordination with the Department of Food and Agriculture, before disbursing these grants.

**AB 2441 (Frazier D) Sacramento-San Joaquin Delta: removal of abandoned commercial vessels.**

**Introduced:** 2/14/2018

**Last Amend:** 8/22/2018

**Status:** 9/19/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 540, Statutes of 2018.

**Location:** 9/19/2018-A. CHAPTERED

**Summary:** Current law authorizes the State Lands Commission to take immediate action, without notice, to remove from areas under its jurisdiction a vessel that is left unattended and is moored, docked, beached, or made fast to land in a position as to obstruct the normal movement of traffic or in a condition as to create a hazard to navigation, other vessels using a waterway, or the property of another. This bill would require the commission, upon receipt by the commission of funds appropriated by the Legislature and any federal or private funds for this purpose, in consultation with other relevant state and local agencies directly involved in the removal of abandoned vessels, by July 1, 2019, to develop a plan for the removal of abandoned commercial vessels, as prescribed.

**AB 2470 (Grayson D) Invasive Species Council of California.**

**Introduced:** 2/14/2018

**Last Amend:** 8/24/2018

**Status:** 9/28/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 870, Statutes of 2018.

**Location:** 9/28/2018-A. CHAPTERED

**Summary:** Would establish the Invasive Species Council of California, with a prescribed membership, to help coordinate a comprehensive effort to prevent the introduction of invasive species in the state and to advise state agencies how to facilitate coordinated, complementary, and cost-effective control or eradication of invasive species that have entered or are already established in the state, as specified.

**AB 2528 (Bloom D) Climate adaptation.**

**Introduced:** 2/14/2018

**Last Amend:** 7/3/2018

**Status:** 9/18/2018-Vetoed by Governor.

**Location:** 9/18/2018-A. VETOED

**Summary:** Current law requires the Natural Resources Agency by July 1, 2017, and every 3 years thereafter, to update the state's climate adaptation strategy to identify vulnerabilities to climate change by sectors, including the biodiversity and habitat sector, and priority actions needed to reduce the risks in those sectors. As part of the update, current law requires the Natural Resources Agency to coordinate with other state agencies to identify a lead agency or group of agencies to lead adaptation efforts in each sector. This bill would add 3 new sectors to the climate adaptation strategy: the land use and community development sector, the climate justice sector, and the parks, recreation, and California culture sector.

**AB 2551 (Wood D) Forestry and fire prevention: joint prescribed burning operations: watersheds.**

**Introduced:** 2/15/2018

**Last Amend:** 8/24/2018

**Status:** 9/21/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 638, Statutes of 2018.

**Location:** 9/21/2018-A. CHAPTERED

**Summary:** Current law authorizes the director of the Department of Forestry and Fire Protection to enter into an agreement with an eligible landowner pursuant to which the landowner will undertake forest resource improvement work in return for an agreement by the director to share the cost of carrying out that work. Current law authorizes the director to make various types of loans, including loans to cover all or part of the landowner's cost for the work. Current law requires these loans to be made for a term not exceeding 20 years and bearing interest at the prevailing rate. This bill would instead authorize the director to enter into those agreements with small nonindustrial landowners, as defined.

**AB 2640 (Wood D) Fully protected species: Lost River sucker and shortnose sucker limited take authorization: California condor limited take authorization.**

**Introduced:** 2/15/2018

**Last Amend:** 8/23/2018

**Status:** 9/20/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 586, Statutes of 2018.

**Location:** 9/20/2018-A. CHAPTERED

**Summary:** Under CESA, the Department of Fish and Wildlife may authorize, by permit, the take of listed species if the take is incidental to an otherwise lawful activity and the impacts are minimized and fully mitigated. This bill would permit the department to authorize, under CESA, the take or possession of the Lost River sucker and shortnose sucker resulting from impacts attributable to or otherwise related to the decommissioning and removal of the Iron Gate Dam, the Copco 1 Dam, the Copco 2 Dam, or the J.C. Boyle Dam, each located on the Klamath River, consistent with the Klamath Hydroelectric Settlement Agreement, if specified conditions are met.

**AB 2697 (Gallagher R) Nesting Bird Habitat Incentive Program: idled agricultural lands.**

**Introduced:** 2/15/2018

**Last Amend:** 8/21/2018

**Status:** 9/20/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 588, Statutes of 2018.

**Location:** 9/20/2018-A. CHAPTERED

**Summary:** Would require the Department of Fish and Wildlife to establish the Nesting Bird Habitat Incentive Program, which may include direct payments or other incentives, to encourage landowners to voluntarily cultivate or retain upland cover crops or other upland vegetation on idled lands to

provide waterfowl, upland game bird, and other wildlife habitat cover for purposes, including, but not limited to, encouraging the use of idle agricultural lands for wildlife habitat. The bill would authorize the department to develop guidelines and criteria for the program as it deems appropriate.

**AB 2721 (Quirk D) Cannabis: testing laboratories.**

**Introduced:** 2/15/2018

**Last Amend:** 3/23/2018

**Status:** 9/19/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 546, Statutes of 2018.

**Location:** 9/19/2018-A. CHAPTERED

**Summary:** Would authorize a testing laboratory to receive and test samples of cannabis or cannabis products from a person over 21 years of age when the cannabis has been grown by that person and will be used solely for his or her personal use pursuant to AUMA. The bill would prohibit a testing laboratory from certifying samples from the person over 21 years of age for resale or transfer to another person. The bill would require all tests pursuant to these provisions to be recorded with the name of the person submitting the sample and the amount of cannabis or cannabis product received.

**AB 2864 (Limón D) Coastal resources: oil spills.**

**Introduced:** 2/16/2018

**Last Amend:** 5/25/2018

**Status:** 9/8/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 311, Statutes of 2018.

**Location:** 8/27/2018-A. CHAPTERED

**Summary:** The Lempert-Keene-Seastrand Oil Spill Prevention and Response Act provides that the administrator for oil spill response, subject to the Governor, has the primary authority to direct prevention, removal, abatement, response, containment, and cleanup efforts with regard to all aspects of any oil spill in waters of the state, in accordance with any applicable facility or vessel contingency plan and the California oil spill contingency plan. This bill, for spills affecting coastal resources, would require the administrator to invite the California Coastal Commission or the San Francisco Bay Conservation and Development Commission, as applicable according to jurisdiction, to participate in the natural resource damage assessment process regarding injuries to coastal resources and potential restoration and mitigation measures for inclusion in the damage assessment and restoration plan.

**AB 2889 (Caballero D) Timber harvesting plans: guidance and assistance.**

**Introduced:** 2/16/2018

**Last Amend:** 4/30/2018

**Status:** 9/21/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 640, Statutes of 2018.

**Location:** 9/21/2018-A. CHAPTERED

**Summary:** Current law prohibits a person, as defined, from conducting timber operations, as defined, unless a timber harvesting plan that meets specified requirements and is prepared by a professional forester for those operations has been submitted to the Department of Forestry and Fire Protection. Current law requires the department to review, approve, or require the modification of, timber harvesting plans in accordance with prescribed procedures. This bill would require the department to provide guidance and assistance to ensure the uniform and efficient implementation of processes and procedures regulating the filing, review, approval, required modification, completion, and appeal of decisions relating to timber harvesting plans, as provided.

**AB 2958 (Quirk D) State bodies: meetings: teleconference.**

**Introduced:** 2/16/2018

**Last Amend:** 8/24/2018

**Status:** 9/28/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 881, Statutes of 2018.

**Location:** 9/28/2018-A. CHAPTERED

**Summary:** The Bagley-Keene Open Meeting Act requires, with specified exceptions, that all meetings of a state body, as defined, be open and public, and all persons be permitted to attend any meeting of a state body, except as provided. Current law, among other things, requires a state body that elects to conduct a meeting or proceeding by teleconference to post agendas at all teleconference locations, to identify each teleconference location in the notice and agenda, and to make each teleconference location accessible to the public. This bill, for a state body that is an advisory board, advisory commission, advisory committee, advisory subcommittee, or similar multimember advisory body, would authorize an additional way of holding a meeting by teleconference, as prescribed, provided it also complies with all other applicable requirements of the Bagley-Keene Open Meeting Act.

**AB 2975 (Friedman D) Wild and scenic rivers.**

**Introduced:** 2/16/2018

**Last Amend:** 5/29/2018

**Status:** 8/27/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 221, Statutes of 2018.

**Location:** 8/28/2018-A. CHAPTERED

**Summary:** Would, if (1) the federal government takes action to enact a statute that, upon enactment, would require the removal or delisting of any river or segment of a river in California that is included in the national wild and scenic rivers system and not in the state wild and scenic rivers system; or (2) the secretary determines that the federal government by enactment of a statute or by executive order has exempted a river or segment of a river in California that is not in the state wild and scenic river system from the protection of certain federal provisions governing restrictions on water resources projects, require the secretary, after holding a public hearing on the issue, based on the information obtained through the public hearing, to determine whether the provision of state protection for the river or segment of the river that has been removed, delisted, or exempted from the federal wild and scenic rivers system is in the best interest of the state and, if so, to take specified actions, until December 31, 2025, to add the river or segment of a river to the state wild and scenic rivers system and to classify that river or segment of a river, as prescribed.

**AB 3133 (Berman D) State Public Works Board.**

**Introduced:** 2/16/2018

**Last Amend:** 6/20/2018

**Status:** 8/28/2018-Approved by the Governor. Chaptered by Secretary of State - Chapter 242, Statutes of 2018.

**Location:** 8/28/2018-A. CHAPTERED

**Summary:** Would add the Secretary of the Natural Resources Agency as a member of the State Public Works Board for the purpose of hearing and deciding matters related to the acquisition of properties or construction of projects for any department, office, or other unit under the jurisdiction of the Natural Resources Agency. This bill would additionally require the chairperson of the board, when the Secretary of the Natural Resources Agency is serving as a member of the board, in the case of a vote of the board that results in a tie, to cast the deciding vote.

**AB 3218 (Arambula D) Millerton Lake State Recreation Area: acquisition of land.**

**Introduced:** 2/16/2018

**Last Amend:** 5/25/2018

**Status:** 9/18/2018-Vetoed by Governor.

**Location:** 9/18/2018-A. VETOED

**Summary:** Would require the Department of Parks and Recreation to effectively manage lands currently within its jurisdiction in the Millerton Lake State Recreation Area adjacent to the San Joaquin River, and would authorize the department to enter into an agreement with the conservancy to



manage lands acquired by the San Joaquin River Conservancy adjacent to the state recreation area, as specified.

**SB 1**

**(Beall D) Transportation funding.**

**Introduced:** 12/5/2016

**Last Amend:** 4/3/2017

**Status:** 4/28/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 5, Statutes of 2017.

**Location:** 4/28/2017-S. CHAPTERED

**Summary:** Would create the Road Maintenance and Rehabilitation Program to address deferred maintenance on the state highway system and the local street and road system. The bill would require the California Transportation Commission to adopt performance criteria, consistent with a specified asset management plan, to ensure efficient use of certain funds available for the program.

**SB 5**

**(De León D) California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access For All Act of 2018.**

**Introduced:** 12/5/2016

**Last Amend:** 9/10/2017

**Status:** 10/15/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 852, Statutes of 2017.

**Location:** 10/15/2017-S. CHAPTERED

**Summary:** Would enact the California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access For All Act of 2018, which, if approved by the voters, would authorize the issuance of bonds in an amount of \$4,000,000,000 pursuant to the State General Obligation Bond Law to finance a drought, water, parks, climate, coastal protection, and outdoor access for all program. The bill, upon voter approval, would reallocate \$100,000,000 of the unissued bonds authorized for the purposes of Propositions 1, 40, and 84 to finance the purposes of a drought, water, parks, climate, coastal protection, and outdoor access for all program.

**SB 50**

**(Allen D) Federal public lands: conveyances.**

**Introduced:** 12/5/2016

**Last Amend:** 9/5/2017

**Status:** 10/6/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 535, Statutes of 2017.

**Location:** 10/6/2017-S. CHAPTERED

**Summary:** Would establish, except as provided, a policy of the state to discourage conveyances of federal public lands in California from the federal government. The bill would, except as provided, specify that these conveyances are void ab initio unless the State Lands Commission was provided with the right of first refusal or the right to arrange for the transfer of the federal public land to another entity.

**SB 80**

**(Wieckowski D) California Environmental Quality Act: notices.**

**Introduced:** 1/11/2017

**Last Amend:** 6/21/2017

**Status:** 3/3/2018-Last day to consider Governor's veto pursuant to Joint Rule 58.5.

**Location:** 10/16/2017-S. VETOED

**Summary:** The California Environmental Quality Act requires the lead agency to mail certain notices to persons who have filed a written request for notices. The act provides that if the agency offers to provide the notices by email, upon filing a written request for notices, a person may request that the notices be provided to him or her by email. This bill would require the lead agency to post those notices on the agency's Internet Web site. The bill would require the agency to offer to provide those

notices by email. Because this bill would increase the level of service provided by a local agency, this bill would impose a state-mandated local program.

**SB 92**

**(Committee on Budget and Fiscal Review) Public resources.**

**Introduced:** 1/11/2017

**Last Amend:** 6/9/2017

**Status:** 6/27/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 26, Statutes of 2017.

**Location:** 6/27/2017-S. CHAPTERED

**Summary:** Current law regulating commercial fishing imposes, or authorizes the imposition of, various license, permit, and registration fees. Current law requires specified persons to pay commercial fishing fees, referred to as a "landing tax," calculated on the total weight of fish delivered, based on a rate-per-pound schedule applicable to specified aquatic species. This bill would rename the "landing tax" as a "landing fee" and would revise the rate schedule by increasing certain fees while decreasing other fees to specified amounts. The bill would make conforming and other related changes.

**SB 94**

**(Committee on Budget and Fiscal Review) Cannabis: medicinal and adult use.**

**Introduced:** 1/11/2017

**Last Amend:** 6/9/2017

**Status:** 6/27/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 27, Statutes of 2017.

**Location:** 6/27/2017-S. CHAPTERED

**Summary:** The Medical Marijuana Program also provides immunity from arrest to those exempt patients or designated primary caregivers who engage in certain acts involving marijuana, up to certain limits, and who have identification cards issued pursuant to the program unless there is reasonable cause to believe that the information contained in the card is false or fraudulent, the card has been obtained by means of fraud, or the person is otherwise in violation of the law. This bill would require probable cause to believe that the information on the card is false or fraudulent, the card was obtained by fraud, or the person is otherwise in violation of the law to overcome immunity from arrest to patients and primary caregivers in possession of an identification card.

**SB 144**

**(McGuire D) Fish and wildlife: steelhead trout: fishing report-restoration card.**

**Introduced:** 1/13/2017

**Last Amend:** 3/15/2017

**Status:** 9/26/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 305, Statutes of 2017.

**Location:** 9/26/2017-S. CHAPTERED

**Summary:** Current law requires revenues from steelhead trout fishing license fees to be deposited in the Fish and Game Preservation Fund and to be available for expenditure, upon appropriation by the Legislature, to monitor, restore, or enhance steelhead trout resources consistent with specified law, and to administer the fishing report-restoration card program. This bill would extend the operation of those provisions to July 1, 2022, to be repealed as of January 1, 2023. The bill would require the department to report to the Legislature regarding the fishing report-restoration card program's projects on or before July 1, 2021.

**SB 161**

**(McGuire D) Fish and Game Commission: tribal committee.**

**Introduced:** 1/19/2017

**Status:** 10/3/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 457, Statutes of 2017.

**Location:** 10/3/2017-S. CHAPTERED

**Summary:** Current law requires the Fish and Game Commission to form a marine resources committee and a wildlife resources committee from its membership. This bill would require the commission to form a tribal committee from its membership consisting of at least one commissioner



and would require the committee to report to the commission from time to time on its activities and to make recommendations on all tribal matters considered by the commission.

**SB 214**     **(Atkins D) San Diego River Conservancy.**

**Introduced:** 2/1/2017

**Last Amend:** 9/5/2017

**Status:** 9/26/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 306, Statutes of 2017.

**Location:** 9/26/2017-S. CHAPTERED

**Summary:** The San Diego River Conservancy Act establishes the San Diego River Conservancy in the Natural Resources Agency, and prescribes the territory, membership, functions, and duties of the conservancy with regard to, among other things, the acquisition, protection, and management of public lands within the San Diego River area, as defined. This bill would specify that the powers of the conservancy include improving, developing, and preserving lands for the purpose of protecting the natural, cultural, and historical resources, and entering into a joint powers agreement, as specified.

**SB 269**     **(McGuire D) Commercial fishing businesses and marine aquaria: landing receipts.**

**Introduced:** 2/8/2017

**Last Amend:** 8/6/2018

**Status:** 9/20/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 601, Statutes of 2018.

**Location:** 9/20/2018-S. CHAPTERED

**Summary:** Current law requires a person licensed as a commercial fish business who takes his or her own fish to make a legible record in the form of a landing receipt, as specified, at the time the fish are brought ashore. This bill would specify that the original signed copy of the paper landing receipt made under those provisions governing landing receipts for a licensed marine aquaria and a commercial fish business who takes his or her own fish shall be delivered to the department on or before the 16th or last day of the month in which the fish were landed, whichever date occurs first after the landing, as prescribed, and would require that landing receipt records that are completed and submitted electronically be submitted to the department within 3 business days, as defined, of the landing.

**SB 345**     **(Bradford D) Law enforcement agencies: public records.**

**Introduced:** 2/14/2017

**Last Amend:** 9/5/2017

**Status:** 3/3/2018-Last day to consider Governor's veto pursuant to Joint Rule 58.5.

**Location:** 10/14/2017-S. VETOED

**Summary:** Would, commencing January 1, 2019, require the Department of Alcoholic Beverage Control, the Department of the California Highway Patrol, the Department of Corrections and Rehabilitation, the Department of Fish and Wildlife, the Department of Justice, the Commission on Peace Officer Standards and Training, and each local law enforcement agency to conspicuously post on their Internet Web sites all current standards, policies, practices, operating procedures, and education and training materials that would otherwise be available to the public if a request was made pursuant to the California Public Records Act.

**SB 473**     **(Hertzberg D) California Endangered Species Act.**

**Introduced:** 2/16/2017

**Last Amend:** 8/16/2018

**Status:** 9/10/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 329, Statutes of 2018.

**Location:** 9/10/2018-S. CHAPTERED

**Summary:** The California Endangered Species Act prohibits the taking of an endangered or threatened species, except in certain situations. Under the act, the Department of Fish and Wildlife

may authorize the take of listed species pursuant to an incidental take permit if the take is incidental to an otherwise lawful activity, the impacts are minimized and fully mitigated, and the issuance of the permit would not jeopardize the continued existence of the species. The act requires the department to adopt regulations for issuance of incidental take permits. This bill would also apply the take prohibition to public agencies.

**SB 495 (Vidak R) Protected species: blunt-nosed leopard lizard: taking or possession.**

**Introduced:** 2/16/2017

**Last Amend:** 6/28/2018

**Status:** 8/27/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 224, Statutes of 2018.

**Location:** 8/28/2018-S. CHAPTERED

**Summary:** Would permit the Department of Fish and Wildlife to authorize, under the California Endangered Species Act, by permit, the take or possession of the blunt-nosed leopard lizard resulting from impacts attributable to or otherwise related to the Allensworth Community Services District's drilling and construction of a new water well, connection of the new water well to the existing distribution system, and construction of a new water storage tank, if specified conditions are met. The bill would also make a conforming change and delete obsolete cross-references.

**SB 506 (Nielsen R) Department of Fish and Wildlife: lake or streambed alteration agreements: Internet Web site.**

**Introduced:** 2/16/2017

**Last Amend:** 6/5/2017

**Status:** 2/4/2018-Last day to consider Governor's veto pursuant to Joint Rule 58.5.

**Location:** 7/21/2017-S. VETOED

**Summary:** Would require the Department of Fish and Wildlife, on or before December 31, 2018, and periodically thereafter, to upgrade the information on its Internet Web site regarding lake or streambed alteration agreements, to update its "Frequently Asked Questions" document and other appropriate sources of information regarding the lake and streambed alteration program, and to provide guidance on its Internet Web site to facilitate members of the public in obtaining individualized guidance regarding the lake and streambed alteration program, as specified.

**SB 580 (Pan D) Water development projects: Sacramento-San Joaquin watersheds.**

**Introduced:** 2/17/2017

**Status:** 9/26/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 309, Statutes of 2017.

**Location:** 9/26/2017-S. CHAPTERED

**Summary:** Current law adopts and authorizes federally adopted and approved projects, including a project for flood control along the American and Sacramento Rivers. The projects are authorized at an estimated cost to the state of the sum that may be appropriated by the Legislature for state participation upon the recommendation and advice of the Department of Water Resources or the Central Valley Flood Protection Board. This bill would revise the authorization for the project for flood control along the American and Sacramento Rivers as further modified by a specified report adopted by Congress.

**SB 615 (Hueso D) Salton Sea restoration.**

**Introduced:** 2/17/2017

**Last Amend:** 9/8/2017

**Status:** 10/15/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 859, Statutes of 2017.

**Location:** 10/15/2017-S. CHAPTERED

**Summary:** Would specify that any barrier in the Salton Sea within or below a certain elevation would not be considered a dam and would provide that the construction of facilities to separate fresh water

from highly saline water for the purposes of implementing restoration activities pursuant to the act shall not be subject to review, approval, inspection, or fees associated with certain laws relating to dams and reservoirs. The bill would state various legislative findings and declarations relating to the Salton Sea, would name the state's comprehensive management plan for the Salton Sea the "John J. Benoit Salton Sea Restoration Plan."

**SB 667 (Atkins D) Department of Water Resources: riverine and riparian stewardship improvements.**

**Introduced:** 2/17/2017

**Last Amend:** 6/20/2017

**Status:** 10/6/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 543, Statutes of 2017.

**Location:** 10/6/2017-S. CHAPTERED

**Summary:** Current law authorizes the Director of Water Resources to establish a program of flood control and urban creek restoration, known as the Urban Streams Restoration Program, consisting of the development of the capability by the Department of Water Resources to respond to requests from local agencies and organizations for planning and design assistance for efficient and effective urban creek protection, restoration, and enhancement. This bill, upon an appropriation of funds from the Legislature, would require the department to establish a program to implement watershed-based riverine and riparian stewardship improvements by providing technical and financial assistance in support of projects with certain benefits.

**SB 790 (McGuire D) Dreissenid mussel infestation prevention: grants.**

**Introduced:** 2/17/2017

**Last Amend:** 8/24/2018

**Status:** 9/19/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 558, Statutes of 2018.

**Location:** 9/19/2018-S. CHAPTERED

**Summary:** Current law establishes a registration fee for vessels, and imposes an additional fee. Current law requires that all revenues from the additional prevention fee be deposited into the Harbors and Watercraft Revolving Fund, and, upon appropriation, be expended for certain purposes relating to the prevention, control, and management of dreissenid mussel infestations. Current law requires that a specified percentage of those revenues deposited into the fund from the prevention fee be made available to entities to be used for grants for the reasonable regulatory costs incident to the implementation of a dreissenid mussel infestation prevention plan. This bill would additionally make any person or entity that manages any aspect of the water in a reservoir, as defined, where recreational, boating, or fishing activities are permitted, eligible for a grant to be used for the reasonable regulatory costs of implementation of a dreissenid mussel infestation prevention plan.

**SB 809 (Committee on Natural Resources and Water) Natural resources.**

**Introduced:** 3/8/2017

**Last Amend:** 6/20/2017

**Status:** 10/5/2017-Approved by the Governor. Chaptered by Secretary of State. Chapter 521, Statutes of 2017.

**Location:** 10/5/2017-S. CHAPTERED

**Summary:** The California Constitution establishes the 5-member Fish and Game Commission, with members appointed by the Governor and approved by the Senate. Current statutory law requires the commissioners to annually elect one of their number as president and one as vice president, by a concurrent vote of at least 3 commissioners. Current law prohibits a president or vice president from serving more than 2 consecutive years. This bill would eliminate this prohibition.

**SB 854 (Committee on Budget and Fiscal Review) Public resources.**

**Introduced:** 1/10/2018

**Last Amend:** 6/11/2018

**Status:** 6/27/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 51, Statutes of 2018.

**Location:** 6/27/2018-S. CHAPTERED

**Summary:** Current law establishes the Department of Fish and Wildlife and vests the department with the jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitats necessary for biologically sustainable populations of those species. Current law designates the department as the trustee for fish and wildlife resources. This bill would specify the mission and the core programs of the department, as provided. The bill would require the department to contract with an independent entity to conduct a comprehensive service-based budget review and to consult on the development of a service-based budget tracking system.

**SB 856** (Committee on Budget and Fiscal Review) **Budget Act of 2018.**

**Introduced:** 1/10/2018

**Last Amend:** 6/21/2018

**Status:** 6/27/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 30, Statutes of 2018.

**Location:** 6/27/2018-S. CHAPTERED

**Summary:** The Budget Act of 2018 made appropriations for the support of state government for the 2018–19 fiscal year. This bill would amend the Budget Act of 2018 by amending and adding items of appropriation and making other changes

**SB 901** (Dodd D) **Wildfires.**

**Introduced:** 1/16/2018

**Last Amend:** 8/28/2018

**Status:** 9/21/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 626, Statutes of 2018.

**Location:** 9/21/2018-S. CHAPTERED

**Summary:** The Budget Act of 2018 appropriated \$99,376,000 to the Office of Emergency Services for purposes of local assistance. Of those funds, \$25,000,000 was made available, pursuant to a schedule, for equipment and technology that improves the mutual aid system. Current law authorizes the Department of Forestry and Fire Protection (CalFire) to administer various programs, including grant programs, relating to forest health and wildfire protection. This bill would revise the Budget Act of 2018 to provide that the \$25,000,000 described above shall be applied to support activities directly related to regional response and readiness.

**SB 1017** (Allen D) **Commercial fishing: drift gill net shark and swordfish fishery: permit transition program.**

**Introduced:** 2/7/2018

**Last Amend:** 8/24/2018

**Status:** 9/27/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 844, Statutes of 2018.

**Location:** 9/27/2018-S. CHAPTERED

**Summary:** Would require the Department of Fish and Wildlife by March 31, 2020, to establish a voluntary permit transition program that includes specified conditions, including a condition that a permittee who voluntarily surrenders his or her drift gill net shark and swordfish permit (DGN permit) and shark or swordfish gill net or nets receive, to the extent that funds for the transition program are available, a specified payment, as prescribed.

**SB 1301** (Beall D) **State permitting: environment: processing procedures: dam safety or flood risk reduction project.**

**Introduced:** 2/16/2018

**Last Amend:** 8/6/2018

**Status:** 9/28/2018-Vetoed by the Governor. In Senate. Consideration of Governor's veto pending.

**Location:** 9/28/2018-S. VETOED

**Summary:** Would require the Office of Planning and Research to develop a joint multiagency preapplication for supplemental consultation and a model fee-for-service agreement, in consultation with a state agency with the power to issue a permit that would authorize a dam safety project or authorize a flood risk reduction project and any interested potential project applicants. The bill would authorize a project applicant to complete a joint multiagency preapplication and submit the preapplication to each state agency named in the preapplication at any time.

**SB 1309 (McGuire D) Fishing: Fisheries Omnibus Bill of 2018.**

**Introduced:** 2/16/2018

**Last Amend:** 8/6/2018

**Status:** 9/30/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 985, Statutes of 2018.

**Location:** 9/30/2018-S. CHAPTERED

**Summary:** Current law requires the Department of Fish and Wildlife to issue a commercial fishing salmon stamp upon application for the stamp and payment of a base fee of \$85. That base fee is required to be adjusted during specified commercial salmon seasons. However, current law prohibits the total fees, as adjusted, from exceeding \$260. Current law requires the department to deposit revenues from this fee, funds received from other sources, as specified, and other specified revenues in the Commercial Salmon Stamp Dedicated Subaccount in the Fish and Game Preservation Fund. This bill would extend the operation of these provisions until January 1, 2029.

**SB 1310 (McGuire D) Fishing: Dungeness crab.**

**Introduced:** 2/16/2018

**Last Amend:** 8/20/2018

**Status:** 9/21/2018-Approved by the Governor. Chaptered by Secretary of State. Chapter 663, Statutes of 2018.

**Location:** 9/21/2018-S. CHAPTERED

**Summary:** Current law sets forth the qualifications for initial issuance of a Dungeness crab vessel permit, including a person's history of participating in the Dungeness crab fishery before the establishment of the permit program, provides that one category of permit issued pursuant to those provisions shall become null and void upon the death of the permittee, and provides a penalty for submitting false information in connection with initial issuance of the permit. Current law provides for renewal of a permit. Current law requires the owner of a permitted vessel to transfer the permit upon sale to the person purchasing the vessel. This bill would delete the provisions relating to the initial issuance of a permit, except for the provision that makes one category of permit null and void upon the death of the permittee.

**SB 1487 (Stern D) Iconic African Species Protection Act.**

**Introduced:** 2/16/2018

**Last Amend:** 7/2/2018

**Status:** 9/30/2018-Vetoed by the Governor. In Senate. Consideration of Governor's veto pending.

**Location:** 9/30/2018-S. VETOED

**Summary:** Would enact the Iconic African Species Protection Act and would prohibit the possession of specified African species and any part, product, or the dead body or parts thereof, including, but not limited to, the African elephant or the black rhinoceros, by any individual, firm, corporation, association, or partnership within the State of California, except as specified for, among other things, use for educational or scientific purposes by a bona fide educational or scientific institution, as defined.

For more information call:

Susan LaGrande, CDFW Deputy Director at (916) 651-6719

Julie Oltmann, CDFW Legislative Representative at (916) 653-9772

You can also find legislative information on the web at <http://leginfo.legislature.ca.gov/> and follow the prompts from the 'bill information' link.





California Fish and Game Commission  
P.O. Box 944209  
Sacramento, CA 94244-2090

STATE OF CALIFORNIA  
EDMUND G. BROWN JR., GOVERNOR  
NATURAL RESOURCES AGENCY



California Department of Fish and Wildlife  
P.O. Box 944209  
Sacramento, CA 94244-2090

**By Electronic Submission to [www.regulations.gov](http://www.regulations.gov)**

**Docket ID Nos.**

**FWS-HQ-ES-2018-0006, FWS-HQ-ES-2018-0007, FWS-HQ-ES-2018-0009**

September 24, 2018

Ryan K. Zinke, Secretary  
U.S. Department of the Interior  
1849 C. St. NW  
Washington, DC 20240

Wilbur Ross, Secretary  
U.S. Department of Commerce  
1401 Constitution Avenue NW  
Washington, DC 20230

Dear Secretaries Zinke and Ross:

**Re: Proposed Amendments to Regulations Implementing the Federal  
Endangered Species Act (83 Fed. Reg. 35174, 35178, 35193, July 25, 2018).**

The California Department of Fish and Wildlife (Department) and the California Fish and Game Commission (Commission) provide comments in response to the regulatory proposal from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (collectively, Services) to amend regulations implementing the federal Endangered Species Act (ESA or Act) (16 U.S.C. § 1531 *et seq.*). We incorporate by reference the separate comments from California Attorney General Xavier Becerra and other States' Attorneys General. The Department and Commission appreciate the purpose of the regulatory proposal as described in the Services' press release is "to improve reliability, regulatory efficiency and environmental stewardship." These are good policy goals. We disagree the proposed amendments will achieve those goals.

**Introduction**

The Department and Commission understand it is the Services' prerogative to pursue administrative rulemaking. However, as California's Governor Brown informed Wyoming Governor Mead and the Western Governors' Association in 2017 with respect to Congressional action on Endangered Species Act reform, the current climate in Washington D.C., marked by chaos and partisanship, will "not result in good conservation policy." The same is true for the Services' current proposal. Durable and effective improvements to the federal ESA require balance and thoughtful dialogue, neither of which are reflected in the current proposal.

Portions of the Services' proposal are inconsistent with the Act. A number of the proposed amendments also contradict case law governing the interpretation and

*Conserving California's Wildlife Since 1870*

application of the Act in California. The proposed amendments would disrupt the federal-state partnership for conservation in California, including in particular the Services' apparent proposal to treat climate science as irrelevant to the implementation of the Act.

These and other elements of the Services' proposal cannot be squared with the conservation and recovery purposes of the Act. Therefore, the Department and Commission respectfully request that the Services suspend further action on the proposal. Instead, the Services should convene a structured, transparent process involving the Department, other state wildlife agencies, and interested stakeholders to develop a more balanced and thoughtful package of regulatory amendments to improve the Services' administration of the Act.

### **California Overview**

The Department and Commission agree that regulatory improvements can make processes more efficient and effective. We also agree with the introductory text in the regulatory packages that states the purposes of the Act are "to provide a means to conserve the ecosystems upon which listed species depend, to develop a program for the conservation of listed species,..." and, as the Services' press release states, to further "the ESA's ultimate goal—recovery of our most imperiled species to the point they no longer need federal protection." The Department and Commission used this ultimate goal as the guide for our comments below – does the proposal overall or any proposed amendment specifically advance the conservation and recovery of California's most imperiled species to the point they no longer need federal protection? For the most part, we conclude they do not.

On September 7, 2018, Governor Brown issued an Executive Order underscoring a continued commitment to protect California's plants, animals, and unique biodiversity through the California Biodiversity Initiative. California is a world biodiversity hotspot. Among the 50 states, California is home to more species of plants and animals than any other state, and the highest number of species found nowhere else in the nation. California is also the fifth largest economy in the world and the most populous of the United States, with an expected population of 50 million people by the middle of this century. California's status as a global economic power and an international leader when it comes to addressing anthropogenic climate change reflects its commitment to science-based decision making and a fundamental understanding that the rich biodiversity of California is key to the state's continued economic growth and the well-being of our people.

### **Status as a State Wildlife Agency**

Secretary Zinke noted in his September 10, 2018 Memorandum regarding "State Fish and Wildlife Management Authority" that "[e]ach of us must recognize the fundamental role of the States in fish and wildlife management, especially where States have primary



authority and responsibility, foster improved conservation of fish and wildlife, and encourage a good neighbor policy with the States.” We appreciate that acknowledgement. We agree with the Secretary that state wildlife agencies have extensive capacity and competence to exercise responsibilities to serve as trustees for fish and wildlife. The Department and Commission believe in enhancing the federal-state partnership for conservation of imperiled species, and we thank the Services for their shared commitment to that goal.

The Department is California’s designated trustee agency for fish and wildlife. As trustee, the Department is vested by state law with jurisdiction to conserve, protect, and manage California’s native fish, wildlife, and plants, and the habitat necessary for biologically sustainable populations of those species. We do so in the sovereign interest of California and with its inherent police power to protect native fish and wildlife. The California Fish and Game Commission was the first wildlife agency in the United States beginning in 1870. The Commission establishes regulations and policies to protect and conserve California’s fish and wildlife for future generations, including designating species under the California Endangered Species Act.

#### **Disruption of Federal-State Partnership**

The Department and Commission have long had a good neighbor relationship with the Services. That relationship and our shared success to date is often cited as the benchmark for innovative and effective partnership in furtherance of the Act.

California is home to some of the earliest and most successful Habitat Conservation Plans developed under the ESA. California has its own state law analog to that conservation tool in the Natural Community Conservation Planning Act (NCCPA) (Cal. Fish and Game Code § 2800 *et seq.*). Between federal and state efforts, there are 15 approved plans covering 2.5 million acres that provide regulatory streamlining and permitting to at least 85 entities while providing conservation benefit to over 320 species. Indeed, the Services’ own proposed regulation (83 Fed. Reg. 35,174, 35,175) specifically cites this California law as an example of integrated partnerships. The proposals to repeal the USFWS “blanket rule,” to expand the circumstances under which the Secretaries may decline to designate critical habitat, and to narrow the extent of habitat conservation threaten to undermine the federal-state partnership in landscape-scale conservation permitting under the NCCPA and ESA in California. These proposals are short sighted. As the fifth largest economy in the world, California’s future requires this very kind of landscape-scale conservation permitting that the ESA already fosters.

California also has its endangered species law. The California Endangered Species Act (CESA) (Cal. Fish and Game Code § 2050 *et seq.*) largely parallels the federal Act, but differs in the higher level of protection afforded candidate and threatened species and the requirement to fully mitigate impacts to protected species. (Cal. Fish and Game

Code §§ 2080, 2085; and 2081, subd. (b)(2.) Currently, 307 species are listed under CESA. Of those, 172 are also listed under the federal ESA.

The Services' proposal would disrupt a key CESA permitting program that is grounded in federal partnership. Where the Services authorize take through Sections 7 or 10 of the Act, that authorization can be the basis for a Department "consistency determination" whereby no separate CESA take authorization is required. (Cal. Fish and Game Code § 2080.1.) Consistency determinations are efficient, avoid redundancy, accelerate permitting, and provide regulatory certainty. That is good government. The Department has issued 300 such determinations.

The Services' proposal would alter processes under Section 7 of the Act, which courts in California have called "the heart of the ESA." Specifically, the Services' proposal would narrow the scope of required analysis assessing the effects of proposed federal agency actions; limit the circumstances where the effects of a federal action on designated critical habitat will lead to a requirement to alter or mitigate for the action; and eliminate any requirement that the Services independently evaluate whether a federal action agency will actually implement measures to avoid, minimize, or offset effects to listed species and critical habitat. These changes would decrease the ability to deploy good government mechanisms like consistency determinations due to the fundamental disparity between the federal and state standards.

In addition, for the first time in the history of the Act, the Services propose to encourage the consideration of economic effects in the listing process, rather than preserving those determinations as an exclusive matter of biological science. In a circumstance where one sovereign makes listing decisions driven by economic considerations (USFWS and NMFS), while another in its own sovereign interest (the Department and Commission) lists species based solely on science and biology, disruption of the federal-state conservation partnership is bound to occur. This disruption would inevitably make things less certain and more burdensome for the regulated community. Nor will considering economics in listing decisions achieve the ultimate goal the Services embrace.

#### **Climate Science Cannot be Ignored**

Particularly troubling is the Services' apparent intent to foreclose consideration of accepted science and bedrock principles of species conservation. Specifically, the Services contend climate change has no bearing on and is not relevant to the federal designation of critical habitat. Melting glaciers, sea level rise, and reduced snow pack are not relevant, the Services claim, because the federal ESA cannot prevent these effects.

Even if true, this statement misses the point. That landscapes and ecosystems, and species abundance and distribution, are inherently dynamic over time is a matter of

indisputable science. Likewise, the consensus view of the international scientific community is that climate change is affecting and will continue at an escalating pace to affect landscapes, ecosystems, and species at a global, regional, and local level.

We cannot ignore the effects of climate change. A vulnerability assessment can be used to determine which species may be most vulnerable to climate change, and why. Many of these assessments have been conducted in California, and these studies provide crucial information for conservation and adaptation planning. The Department has completed or funded climate change vulnerability assessments for fish, wildlife, and plants, which can be found at <https://www.wildlife.ca.gov/Conservation/Climate-Science/Resources/Vulnerability>. The climate vulnerability ranks and associated maps provide a comprehensive view of climate vulnerability of species and habitats in California. Species that were identified as climate vulnerable were included in the 2015 California State Wildlife Action Plan as species of greatest conservation need. The continued existence and recovery of imperiled species requires consideration of climate change science in the context of implementing the federal ESA.

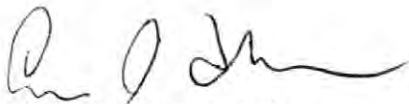
### **Conclusion**

The Department and Commission appreciate the opportunity to comment on the Services' proposed regulatory amendments. We urge the Services to table the current proposal and instead continue a collaborative discussion on how best to implement the Act in California. Doing so will allow us to strengthen, not weaken, the federal-state partnership in species conservation. We stand ready to engage in that discussion at your earliest convenience.

Sincerely,

A handwritten signature in blue ink, appearing to read "C. Bonham", with a long horizontal flourish extending to the right.

Charlton H. Bonham, Director  
California Department of Fish and Wildlife

A handwritten signature in black ink, appearing to read "Eric Sklar", with a long horizontal flourish extending to the right.

Eric Sklar, President  
California Fish and Game Commission

**COMMENTS OF THE ATTORNEYS GENERAL OF MASSACHUSETTS,  
CALIFORNIA, MARYLAND, NEW YORK, OREGON, PENNSYLVANIA, RHODE  
ISLAND, VERMONT, WASHINGTON, AND THE DISTRICT OF COLUMBIA**

September 24, 2018

**By Electronic Submission to [www.regulations.gov](http://www.regulations.gov)**

Hon. Ryan K. Zinke, Secretary  
U.S. Department of the Interior  
1849 C Street N.W.  
Washington, D.C. 20240

Hon. Wilbur Ross, Secretary  
U.S. Department of Commerce  
1401 Constitution Avenue N.W.  
Washington, D.C. 20230

Re: Comments on Proposed Rules entitled:

**Docket ID No. FWS-HQ-ES-2018-0006:** Revision of the Regulations for  
Listing Species and Designating Critical Habitat, 83 Fed. Reg. 35,193 (July 25, 2018)

**Docket ID No. FWS-HQ-ES-2018-0009:** Revision of Regulations for  
Interagency Cooperation, 83 Fed. Reg. 35,178 (July 25, 2018)

**Docket ID No FWS-HQ-ES-2018-0007:** Revision of the Regulations for  
Prohibitions to Threatened Wildlife and Plants, 83 Fed. Reg. 35,174 (July 25, 2018)

Dear Secretaries Zinke and Ross:

The undersigned ten State Attorneys General of the Commonwealths of Massachusetts and Pennsylvania, and the States of California, Maryland, New York, Oregon, Rhode Island, Vermont, Washington, and the District of Columbia (together, the “States”) respectfully submit the following comments on the Fish and Wildlife Service (“FWS”) and the National Marine Fisheries Service’s (“NMFS”) (together, the “Services”) proposed rules entitled *Revision of the Regulations for Listing Species and Designating Critical Habitat*, 83 Fed. Reg. 35,193 (July 25, 2018) (hereinafter the “Listing Rule”), and *Revision of Regulations for Interagency Cooperation*, 83 Fed. Reg. 35,178 (July 25, 2018) (hereinafter the “Interagency Consultation Rule”), and FWS’s proposed rule entitled *Revision of the Regulations for Prohibitions to Threatened Wildlife and Plants*, 83 Fed. Reg. 35,174 (July 25, 2018) (hereinafter the “4(d) Rule”) (together, the “Proposed Rules”). The Proposed Rules are untethered to, and in clear violation of, the species-protective requirements and overriding conservation purpose of the Endangered Species Act (“ESA” or “Act”) enacted by Congress in 1973. In plain disregard of established law, they



would wreak havoc on one of our nation’s most successful conservation laws and harm the States’ vital interests in species protection.

Among other troubling defects, the Proposed Rules would unlawfully allow the Services to weave economic cost considerations into, and discount scientific information throughout, their decision making; ignore grave threats to species’ survival like climate change; reduce the number and extent of critical habitat designations for listed species; restrict the circumstances under which federal agencies must engage in interagency consultations and dramatically narrow the scope of such consultations; and leave threatened species unprotected from harm while the FWS works through its ever-present backlog of rulemaking obligations. Rather than promote the regulatory efficiency the agencies purportedly seek, the Proposed Rules, if finalized, would achieve precisely the opposite, burying the Services in paperwork, increasing the backlog of outstanding listing and designation decisions, and inviting litigation. The Proposed Rules also violate the plain language of the Act, its legislative history, and its overarching precautionary approach and, further, are arbitrary and capricious, lacking any reasoned basis. What is more, the Services altogether have failed to study the devastating environmental effects of the Proposed Rules, in violation of the National Environmental Policy Act (“NEPA”).

We urge the Services to withdraw these misguided proposals and instead fulfill their longstanding statutory obligation to conserve the precious biological resources of our States and nation, the value of which “is, quite literally, incalculable.” *Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 178-79 (1978).

## INTRODUCTION AND EXECUTIVE SUMMARY

Congress enacted the ESA nearly forty-five years ago in a bipartisan effort “to halt and reverse the trend toward species extinction, whatever the cost.” *Id.* at 184; *see* 16 U.S.C. § 1531(a). As President Nixon explained in signing the Act, “[n]othing is more priceless and more worthy of preservation than the rich array of animal life with which our country has been blessed.”<sup>1</sup> The ESA accordingly enshrines a national policy of “institutionalized caution” in recognition of the “overriding need to devote whatever effort and resources [are] necessary to avoid further diminution of national and worldwide wildlife resources.” *Hill*, 437 U.S. at 177, 194 (internal quotation omitted).<sup>2</sup> That pervasive goal “is reflected not only in the stated policies of the Act, but in literally every section of the statute.” *Id.* at 184.

The Act achieves its salutary purpose through multiple vital programs, each of which is undermined by the Proposed Rules. Section 4—the “cornerstone of effective implementation of the [ESA],” S. REP. NO. 97-418, at 10 (1982)—provides for the listing of both endangered and threatened species based solely on the best scientific and commercial data about threats to the species, 16 U.S.C. § 1533(a)(1)-(2), (b)(1). Section 9 in turn prohibits “take” (*e.g.*, killing, injuring, or harming) of listed endangered fish and wildlife species, and section 4(d) authorizes extension of that prohibition to listed threatened species to ensure their conservation in line with

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<sup>1</sup> President’s Statement on Signing the Endangered Species Act of 1973, 374 PUB. PAPERS, 1027, 1027-1028 (Dec. 28, 1973).

<sup>2</sup> *See also Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 698-99 (1995) (describing broad purposes of Act).

the Act’s overarching precautionary approach. *Id.* §§ 1533(d), 1538(a)(1)(G), (a)(2)(E). Section 4 of the Act also ensures the survival and recovery of listed species by requiring the Services, concurrently with species listing, to designate habitat essential to their conservation, termed critical habitat. *Id.* §§ 1532(5)(A), 1533(a)(3). Finally, section 7 reflects “an explicit congressional decision to require agencies to afford first priority to the declared national policy of saving endangered species,” elevating concern for species protection “over the ‘primary missions’ of federal agencies.”” *Hill*, 437 U.S. at 185. Accordingly, section 7 mandates that all federal agencies, in consultation with the Services, must “insure” that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or adversely affect critical habitat. 16 U.S.C. § 1536(a)(2).<sup>3</sup>

The three Proposed Rules—admittedly developed to further a deregulatory agenda<sup>4</sup>—would fundamentally undercut these programs while purporting merely to increase clarity and encourage efficiency and transparency.

**First, the Listing Rule** violates the ESA’s express requirements for listing of endangered and threatened species and designating critical habitat without any cogent rationale for upending its longstanding listing and critical habitat designation processes. *See infra* Section II.A., pp.10-23. The proposal unlawfully and arbitrarily:

- injects economic considerations and quantitative thresholds into the Act’s science-driven, species-focused analyses;
- limits the circumstances under which species can be listed as threatened;
- eliminates consideration of species’ recovery in the delisting process;
- expands the Act’s expressly and purposefully narrow exemptions for designation of critical habitat; and
- limits the circumstances under which unoccupied critical habitat would be designated, particularly where climate change poses a threat to species habitat.

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<sup>3</sup> See also 16 U.S.C. §§ 1531(b)-(c), 1532(3) (directing all federal agencies to conserve endangered and threatened species and to utilize their authorities in furtherance of Act’s species-protective purposes).

<sup>4</sup> Listing Rule, 83 Fed. Reg. at 35,194 (citing Executive Order 13,777, “Enforcing the Regulatory Reform Agenda,” as impetus for rulemaking); Interagency Consultation Rule, 83 Fed. Reg. at 35,179 (same); 4(d) Rule, 83 Fed. Reg. at 35,175-76 (same).

**Second, the Interagency Consultation Rule** would upend the ESA's section 7 federal agency consultation process in violation of the plain language and purpose of the Act and without any reasoned basis. *See infra* Section II.B., pp.23-34. Among other unlawful changes, the Services' proposals would:

- limit the circumstances under which a federal agency action would be deemed to destroy or adversely modify designated critical habitat;
- limit the scope and extent of the analysis of the effects of a federal agency action;
- include several significant new exemptions from the consultation requirement;
- limit the instances where changed circumstances would require re-initiation of consultation on a federal agency action;
- Limit federal action agencies' duty to insure mitigation of the adverse effects of their proposals and give federal action agencies the ability to make biological determinations that the Services are required to make; and
- allow for broad-based "programmatic" and "expedited" consultations that give short shrift to site-specific and in-depth analysis of a proposed federal agency action.

**Third, the 4(d) Rule** proposes to remove, going forward, the "blanket" extension to threatened species of all protections afforded to endangered plants and animals under the ESA, a radical departure from the longstanding, conservation-based agency policy and practice of providing default section 9 protections to all newly listed threatened plant and animal species. *See infra* Section II.C., pp.34-37.

- FWS's new proposal is contrary to the ESA's conservation purpose and precautionary approach because it inevitably would leave threatened species without protections necessary to promote recovery, either temporarily or permanently, and increase the risk that they will become endangered.
- The agency provides no sound reason for this abrupt policy change, which would strain already overburdened agency resources and generate litigation.

**Finally,** the Services have violated NEPA by altogether failing to assess the environmental impacts of the Proposed Rules or to circulate such analyses for public review and comment. *See infra* Section III., pp.37-40. Each of the Proposed Rules is without question a major federal action, each will significantly affect the human environment by eviscerating the ESA's important species protections, and none qualifies for the limited, largely procedural categorical exclusions from NEPA compliance available to the Services. The Services must now properly analyze the Proposed Rules' dire environmental consequences, and prepare an Environmental Impact Statement to enable meaningful public comment and ensure fully informed decision making in compliance with NEPA.

## **I. The States Are Uniquely Positioned To Demand that the Services Faithfully Implement the Endangered Species Act.**

The States are uniquely qualified to evaluate, and demand withdrawal of, the Services' proposals to weaken the ESA: States have significant interests in the conservation of their natural heritage; States and their residents suffer when species conservation measures are curtailed and their biological diversity is threatened and in turn have benefitted from successful implementation of the Act; and States seeking to protect their natural resources would need to devote significant resources and institutional capacity to make up for the Services' failures to properly implement the Act, if the Proposed Rules are finalized.

First, States have a concrete interest in preventing harm to their natural resources, both in general and under the ESA in particular. States are harmed in their *parens patriae* capacity when their residents suffer due to environmental degradation. *See Alfred L. Snapp & Son, Inc. v. Puerto Rico*, 458 U.S. 592, 607 (1982); *Maryland v. Louisiana*, 451 U.S. 725, 737-38 (1981). And, as the Supreme Court has recognized, States are entitled to special solicitude in seeking to remedy environmental harms. *See Massachusetts v. Environmental Prot. Agency*, 549 U.S. 497, 519-22 (2007). These interests are particularly robust in the context of the ESA, which conserves the invaluable natural heritage within States' borders. Indeed, in many States, wildlife resources are held in trust by the States for the benefit of the people of the State.<sup>5</sup> Accordingly, the Act specifically directs the Services to "cooperate to the maximum extent practicable with the States" in implementing the Act and also gives States a special seat at the table in ensuring faithful and fully informed implementation of the Act's species-conservation mandates. 16 U.S.C. § 1535(a).<sup>6</sup> The States thus have an important voice in preventing and remedying harm to endangered and threatened species and their habitat.

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<sup>5</sup> *See* Michael C. Blumm & Aurora Paulsen, *The Public Trust in Wildlife*, 2013 UTAH L. REV. 1437, 1488-93 App. A (2013) (summarizing state wildlife trust law); *Geer v. Connecticut*, 161 U.S. 519, 527-29 (1896), *overruled on other grounds by Hughes v. Oklahoma*, 441 U.S. 322, 326 (1979); *see also, e.g.*, CAL. FISH & GAME CODE §§ 711.7(a), 1802 (State of California holds its fish and wildlife resources in trust for people of State); WASH. REV. CODE 77.75.070 ("Wildlife resources are managed in trust by the respective states for the benefit of all residents and visitors."); VT. STAT. ANN. tit. 10, § 4081(a)(1) ("[T]he fish and wildlife of Vermont are held in trust by the State for the benefit of the citizens of Vermont and shall not be reduced to private ownership. The State of Vermont, in its sovereign capacity as a trustee for the citizens of the State, shall have ownership, jurisdiction, and control of all the fish and wildlife of Vermont.").

<sup>6</sup> *See also, e.g.*, 16 U.S.C. § 1531(a)(5) (encouraging State species conservation); *id.* § 1533(b)(1)(A), (b)(1)(B)(ii) (accounting for State efforts); *id.* §§ 1533(b)(5), 1536(a)(2) (State consultation requirements for critical habitat designation); *id.* § 1533(b)(7) (notice of emergency regulations to States where species believed to occur); *id.* § 1533(g) (monitoring of recovered species in cooperation with State); *id.* § 1533(i) (heightened justification required where regulations inconsistent with State agency's comments or petition); *id.* § 1536(e) (each affected State must be represented on Endangered Species Committee established during consultation exemption procedure); *id.* § 1535 (requiring Services to cooperate with States); *id.* § 1536(g) (State governors included in exemption application process); *id.* § 1537a(e)(2) (States to participate in implementation of the Western Convention); *id.* § 1540(e)(1) (Services may use State agency resources to enforce ESA).



Second, and relatedly, any efforts to weaken implementation of the ESA would put at risk the States' irreplaceable natural heritage and harm the States and their residents in numerous ways. The ESA recognizes that endangered and threatened "species of fish, wildlife, and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people." *Id.* § 1531(a)(3). Reducing our wealth of wild species would damage each of these values and "diminish[] a natural resource that could otherwise be used for present and future commercial purposes." *National Ass'n of Home Builders v. Babbitt*, 130 F.3d 1041, 1053-53 (D.C. Cir. 1997); *see also San Luis & Delta-Mendota Water Auth. v. Salazar*, 638 F.3d 1163, 1177 (9th Cir. 2011). And although the harms that would result from the loss of biological diversity are enormous, the nation cannot fully apprehend their scope because of the "unknown uses that endangered species might have and . . . the *unforeseeable* place such creatures may have in the chain of life on this planet." *Hill*, 437 U.S. at 178-79 (emphases in original).<sup>7</sup>

Over the last four decades, the States have seen significant benefits<sup>8</sup> and steps toward recovery of at-risk species from the Services' implementation of the ESA, including the recovery and delisting of our national bird, the bald eagle (*Haliaeetus leucocephalus*). Among other examples, populations of the Atlantic Coast piping plover (*Charadrius melodus*), which is listed as a threatened species along most of the East Coast, have more than doubled in the last twenty years thanks to FWS's conservation planning, federal enforcement, and cooperative efforts between federal, state, and local partners pursuant to the ESA.<sup>9</sup> Recovery efforts have been particularly successful in Massachusetts, where the East Coast's largest piping plover breeding population has rebounded from fewer than 150 pairs in 1990, to about 642 pairs in 2016,<sup>10</sup> increasing 500 percent since the species was listed in 1986.<sup>11</sup> Despite these gains, however, piping plovers' continued recovery is threatened by habitat loss from sea level rise caused by climate change.<sup>12</sup>

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<sup>7</sup> *See also National Ass'n of Home Builders*, 130 F.3d at 1052-53.

<sup>8</sup> Species recovery also benefits biodiversity in entire ecosystems. *See generally* William J. Ripple & Robert L. Beschta, *Trophic cascades in Yellowstone: The first 15 years after wolf reintroduction*, 145 *Biological Conservation*, 205, 206 (2012) (reintroduction of gray wolves to Yellowstone National Park restored a trophic cascade, resulting in rebounded plant growth, greater forage opportunities for several species, and increased beaver and bison populations), available at <https://doi.org/10.1016/j.biocon.2011.11.005>; Madhu Rao & Trond Larsen, *Ecological Consequences of Extinction*, 3 *LESSONS IN CONSERVATION* 25, 27-28 (2010) (studies demonstrate that species extinctions are likely to have far-reaching consequences, including cascading extinctions of other species and disruptions of ecosystem function), available at [https://www.amnh.org/content/download/141367/2285419/file/LinC3\\_EcolCon.pdf](https://www.amnh.org/content/download/141367/2285419/file/LinC3_EcolCon.pdf).

<sup>9</sup> *See Piping Plover* (*Charadrius melodus*), FWS, <https://www.fws.gov/northeast/pipingplover/index.html> (last updated Apr. 5, 2018); *see also United States v. Town of Plymouth*, 6 F. Supp. 2d 81, 92-94 (D. Mass. 1998) (federal enforcement example).

<sup>10</sup> MASS. DIV. OF FISHERIES & WILDLIFE, SUMMARY OF THE 2016 MASSACHUSETTS PIPING PLOVER CENSUS (updated 2018), available at <http://www.mass.gov/eea/docs/dfg/nhesp/species-and-conservation/plover-census-report-mass-2016.pdf>.

<sup>11</sup> *See Piping Plover*, *supra* note 9.

<sup>12</sup> *See* MASS. DIV. OF FISHERIES & WILDLIFE & ICF INT'L, HABITAT CONSERVATION PLAN FOR PIPING PLOVER 2-10 to 2-25, 5-21 to 5-22 (2016), available at [https://www.fws.gov/newengland/pdfs/MADFW\\_HCP/MADFW%20Final%20Piping%20Plover%20HCP\\_June%202016.pdf](https://www.fws.gov/newengland/pdfs/MADFW_HCP/MADFW%20Final%20Piping%20Plover%20HCP_June%202016.pdf).

The California condor (*Gymnogyps californianus*), the largest land bird in North America, has been listed as “endangered” since the Act’s inception and was on the brink of extinction in 1982 with just twenty-three known individuals. By 1987, all remaining wild condors had been placed into a captive breeding program. Recovery efforts led by FWS, California state agencies, and other partners have increased the population to 463 birds as of 2017 and successfully reintroduced captive-bred condors to the wild. These efforts are now in their final phase, with a focus on creating self-sustaining populations and managing continued threats to the species, such as lead ammunition, trash, and habitat loss.<sup>13</sup>

The smallest rabbit in North America, the pygmy rabbit (*Brachylagus idahoensis*), was listed as an endangered species under Washington State law in 1993 and by 2001 was considered nearly extinct, with an estimated population of fewer than 50 individuals. In 2003, FWS also listed a distinct population segment of the species known as the Columbia Basin pygmy rabbit as an endangered species under the Federal ESA. Since that time, the species has begun to recover in Washington as a result of a cooperative effort by FWS, the Washington Department of Fish and Wildlife, researchers, and other state agencies. Thousands of rabbits have been reintroduced on state and private land, with promising evidence of a growing population. Recovery would not be possible without the mutually supporting protections of state and federal law.<sup>14</sup>

The shortnose sturgeon (*Acipenser brevirostrum*) is an anadromous fish found in rivers, estuaries, and coastal waters along the Atlantic Coast of North America.<sup>15</sup> Overfishing, river damming, and water pollution greatly reduced its numbers, and the shortnose sturgeon was listed as endangered in 1967. However, fishing prohibitions and habitat protection efforts led by NMFS and New York have allowed the shortnose sturgeon population to increase in New York’s Hudson River from about 12,669 in 1979 to more than 60,000 today.<sup>16</sup>

The Delmarva fox squirrel, found primarily in Maryland and included on the original list of federally endangered species, has successfully recovered and was delisted by FWS in December 2015. At the time it was listed, the Delmarva fox squirrel had been limited to just 10 percent of its historic range due to forest clearing and overhunting and was found almost exclusively in three Maryland counties. Through concerted conservation efforts triggered by the ESA, the species’ range now encompasses ten counties in three States—Maryland, Delaware, and Virginia—and, with an estimated population of 17,000-20,000, the species is no longer at

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<sup>13</sup> See *California Condor Recovery Program*, FWS, <https://www.fws.gov/cno/es/CalCondor/Condor.cfm> (last updated May 23, 2018).

<sup>14</sup> See *Pygmy Rabbits in Washington*, WASH. DEP’T FISH & WILDLIFE (June 2015), available at [https://wdfw.wa.gov/conservation/pygmy\\_rabbit/](https://wdfw.wa.gov/conservation/pygmy_rabbit/); *Pygmy Rabbit (Columbia Basin DPS)*, FWS, <https://www.fws.gov/wafwo/articles.cfm?id=149489590> (last visited Sept. 20, 2018).

<sup>15</sup> NOAA FISHERIES, ATLANTIC AND SHORTNOSE STURGEON, available at <https://www.greateratlantic.fisheries.noaa.gov/protected/atlsturgeon/docs/sturgeonfactsheetfinal.pdf>.

<sup>16</sup> *The Endangered Species Act: A Wild Success*, CTR. FOR BIOLOGICAL DIVERSITY, [https://www.biologicaldiversity.org/campaigns/esa\\_wild\\_success/](https://www.biologicaldiversity.org/campaigns/esa_wild_success/) (last visited Sept. 20, 2018).

risk of extinction.<sup>17</sup> These are but a few of the many examples of successful, robust, and cooperative implementation of the ESA by the Services and State partners, success stories that likely would not be possible under the Proposed Rules.

Third, the States have institutional and proprietary interests in the Services' full compliance with the Act's plain language and overriding conservation purpose, because States would have to attempt to fill the regulatory and enforcement void left by the Services' failure to adequately protect the nation's irreplaceable biological resources. Many States have laws and regulations that protect species within their borders to the same extent or greater than the federal ESA.<sup>18</sup> In such circumstances, the Services and the States take account of each other's efforts to conserve rare species and often work cooperatively to share the responsibility and workload required for their protection.<sup>19</sup>

If the Services finalize the Proposed Rules and thus weaken federal species protections, the responsibility for, and burden of, protecting imperiled species and habitats within State borders would fall primarily on the States. This would detract from State efforts and resources to carry out their more protective programs and impose significantly increased costs and burdens on the States. For example, under the proposed 4(d) Rule, species newly listed as threatened under both State and federal law would be subject to a "take" prohibition *only* under State law. *See, e.g.,* MASS. GEN. LAWS. ch. 131A, § 2; CAL. FISH & GAME CODE §§ 2080, 2085. In such circumstances, the States would have to shoulder the costs of conservation while FWS clears its

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<sup>17</sup> *See* FWS, DELMARVA PENINSULA FOX SQUIRREL (*SCIURUS NIGER CINEREUS*): QUESTIONS AND ANSWERS ABOUT REMOVAL FROM THE LIST OF THREATENED AND ENDANGERED SPECIES (Nov. 13, 2015), available at [https://www.fws.gov/chesapeakebay/EndSppWeb/DFS/FAQs\\_DFSdelist\\_2015.pdf](https://www.fws.gov/chesapeakebay/EndSppWeb/DFS/FAQs_DFSdelist_2015.pdf).

<sup>18</sup> *See* 16 U.S.C. § 1535; *see, e.g.,* MASS. GEN. LAWS. ch. 131A, §§ 1-7; 321 CODE MASS. REGS. §§ 10.00 *et seq.* (creating three classifications of protected species, "Endangered," "Threatened," and "Special Concern," and currently listing 427 species, including 401 species not listed under the federal ESA); California Endangered Species Act, CAL. FISH & GAME CODE §§ 2050 *et seq.*; California Natural Communities Conservation Planning Act, CAL. FISH & GAME CODE §§ 2800 *et seq.*; REV. CODE WASH. 77.12.020 (authorizing the classification of wildlife as "protected" or "endangered"); WASH. ADMIN. CODE § 220-610-110 (creating the protected subcategories of "sensitive" and "threatened," and establishing procedures for listing); VT. STAT. ANN. tit. 10, §§ 5401 *et seq.* (protecting endangered and threatened species and critical habitat, and currently listing 52 animal species, 44 of which are not listed under the federal ESA, and 163 plant species, 160 of which are not listed under the federal ESA); Maryland Endangered Species of Fish Conservation Act, MD. CODE ANN., NAT. RES. §§ 4-2A-01 *et seq.* (providing authority for listing and protection of fish species "[i]n addition to the species deemed to be endangered or threatened pursuant to the Endangered Species Act"); Maryland Nongame and Endangered Species Act, MD. CODE ANN., NAT. RES. §§ 10-2A-01 *et seq.* (providing authority for listing and protection of species of wildlife and plant "[i]n addition to the species deemed to be endangered or threatened pursuant to the Endangered Species Act").

<sup>19</sup> *See* 16 U.S.C. § 1533(b)(1)(A), (b)(1)(B)(ii). Under Washington State rules, for example, federal listing initiates state listing and development of a recovery plan. Consequently, federal and state protections operate synergistically, and the reduction of federal protections for threatened species will render state recovery plans less effective. *See* WASH. ADMIN. CODE § 220-610-110 (3.2); *see also* VT. STAT. ANN. tit. 10, §§ 5402(e)(2), 5402a(c)(2) (requiring that for listing or delisting species or designating critical habitat Agency of Natural Resources "notify and consult with appropriate officials in Canada, appropriate state and federal agencies, [and] other states having a common interest in the species," among others).

backlog and irons out the details of a species-specific rule (if it ever even does so), or else risk irreversible damage to the threatened species in the meantime. *See Air Alliance Hous. v. U.S. Env'tl. Prot. Agency*, No. 17-1155, slip op. at 18-19 (D.C. Cir. Aug. 17, 2018) (“Monetary expenditures to mitigate and recover from harms that could have been prevented absent the [federal rule] are precisely the kind of ‘pocketbook’ injury that is incurred by the state itself.” (citing *Alfred L. Snapp & Son, Inc.*, 458 U.S. at 602)).<sup>20</sup> And, importantly, despite these resource-intensive efforts, the States would not be able to wholly fill the regulatory gap created by abrogation of the blanket 4(d) Rule and other proposed changes because some states with significant biodiversity do not adequately protect endangered or threatened species under state law.<sup>21</sup> In such cases, federal regulation is the only defense for resident at-risk species.

For all these reasons, the States have a special perspective on implementation of the ESA that demands the Services’ attention here.

## **II. The Proposed Rules Violate the Text and Purpose of the Endangered Species Act and Lack Any Reasoned Basis.**

The Proposed Rules violate several bedrock principles of administrative law. While agencies often have discretion to carry out statutory mandates, they may not regulate in a manner that is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law” or “in excess of statutory . . . authority.” 5 U.S.C. § 706(2)(A), (C). First, agencies altogether lack authority to adopt regulations that are “manifestly contrary to the statute.” *Chevron U.S.A., Inc. v. Natural Res. Def. Council*, 467 U.S. 837, 843 (1984); *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 703 (1995). Second, in promulgating a regulation “the agency must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.” *Motor Vehicle Mfrs. Ass’n of the United States, Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (quotation and citation omitted). Agency regulation is arbitrary and capricious if the agency “relie[s] on factors which Congress has not intended it to consider” or “entirely fail[s] to consider an important aspect of the problem.” *Id.* Finally, in promulgating regulations agencies must afford the public notice of the *specific*—not vaguely stated—regulatory changes and their reasoned basis to provide the public a meaningful opportunity for comment. *Home Box Office, Inc. v. Federal Commc’ns Comm’n*, 567 F.2d 9, 35-36 (D.C. Cir. 1977).<sup>22</sup>

These core principles apply equally to an agency’s decision to change existing policy. *Federal Commc’ns Comm’n v. Fox Television Stations*, 556 U.S. 502, 513-15 (2009). While an

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<sup>20</sup> Federal enforcement has been instrumental in the ongoing recovery of the threatened piping plover in Massachusetts. *See, e.g., Town of Plymouth*, 6 F. Supp. 2d at 92-94. With delayed protection for newly listed threatened species, similar success stories would be possible only with ramped up state enforcement.

<sup>21</sup> For example, West Virginia is home to dozens of federally listed endangered and threatened species, but has no state legislation aimed at protecting threatened or endangered species. *See* W.VA. DIV. OF NAT. RESOURCES, FEDERALLY THREATENED AND ENDANGERED SPECIES IN WEST VIRGINIA (Mar. 28, 2018), available at <http://www.wvdnr.gov/Wildlife/PDFFiles/TElist.pdf>; *Rare, Threatened, and Endangered Species*, W.VA. DIV. OF NAT. RESOURCES, <http://www.wvdnr.gov/wildlife/endangered.shtm> (last visited Sept. 20, 2018).

<sup>22</sup> *See also Gerber v. Norton*, 294 F.3d 173, 179 (D.C. Cir. 2002).

agency need not show that a new rule is “better” than the rule it replaced, it still must demonstrate that “it is permissible under the statute, that there are good reasons for it, and that the agency believes it to be better, which the conscious change of course adequately indicates.” *Id.* at 515 (emphases omitted). Further, an agency must “provide a more detailed justification than what would suffice for a new policy created on a blank slate” when “its new policy rests upon factual findings that contradict those which underlay its prior policy.” *Id.* Any “[u]nexplained inconsistency” between a rule and its repeal is “a reason for holding an [agency’s] interpretation to be an arbitrary and capricious change.” *National Cable & Telecomms. Ass’n v. Brand X Internet Servs.*, 545 U.S. 967, 981 (2005).

The Proposed Rules fail each of these requirements for lawful agency action and therefore must be withdrawn. The Listing Rule, Interagency Cooperation Rule, and 4(d) Rule violate the ESA’s text, structure, and purpose, and exceed the scope of the Agencies’ authority and discretion under the Act. In addition, the Services have failed to provide a reasoned justification for the proposed changes, relied on factors Congress did not intend for them to consider, or entirely overlooked important issues at the heart of their species-protection duties under the Act. The Services further have evaded their notice obligations under the Administrative Procedure Act by posing vague questions in the Federal Register notices about possible additional and damaging changes to the regulations without specific proposed regulatory text or explanation for the proposed changes. We address each rule and its legal flaws in turn below.

**A. Listing Rule, 83 Fed. Reg. 35,193 (July 25, 2018)**

Docket ID No. FWS-HQ-ES-2018-0006

**i. Addition of Economic Impacts to Listing Analyses.**

The Listing Rule proposes to remove the listing regulation’s current restriction, embodied in section 4 of the ESA, that species listing, reclassification, and delisting decisions must be made “without reference to possible economic or other impacts of such determination.” 50 C.F.R. § 424.11(b); *see* 83 Fed. Reg. at 35,194-95, 35,200. In removing that limitation, the Services aim to inject consideration of economic impacts into the species threshold listing, delisting, and reclassification determinations in clear violation of the Act’s express terms and without any reasoned explanation.

First, the Services’ economic-cost proposal violates the ESA’s express terms, legislative intent, and case law. The ESA could not be clearer on this point: species listing decisions must be made “*solely* on the basis of the best scientific and commercial data available” about the status of the species. 16 U.S.C. § 1533(b)(1)(A) (emphasis added).<sup>23</sup> Whereas the ESA authorizes consideration of economic impacts in determining what areas to designate as critical habitat, *id.* § 1533(b)(2), it expressly requires that all listing decisions center exclusively on the biological threats to the species, such as habitat destruction, disease, and predation, without regard to the economic effects of listing, *id.* § 1533(a)(1), (b)(1)(A).

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<sup>23</sup> The reference to “commercial data” in the statute’s listing provisions is intended to allow the Services to consider data about trading of species and is “not intended, in any way, to authorize the use of economic considerations in the process of listing a species.” H.R. REP. No. 97-567, at 20 (1982).



Legislative history and case law confirm that the term “solely” was meant to preclude economic analysis at the listing stage. “The plain intent of Congress in enacting [the ESA] was to halt and reverse the trend toward species extinction, *whatever the cost*.” *Hill*, 437 U.S. at 184 (emphasis added). As numerous courts have recognized,<sup>24</sup> Congress added the term “solely” to section 4’s listing provisions in 1982 to emphasize that listing determinations were to be made “solely upon biological criteria and to prevent non-biological considerations from affecting such decisions.” H.R. REP. NO. 97-567, at 19 (1982); *see also id.* at 20.<sup>25</sup> This amendment was intended to “improve[] and expedite[]” the listing process and to divert “the balancing between science and economics” to “the [critical habitat] exemption process.” *Id.* at 12.<sup>26</sup>

The Services’ proposed elimination of the prohibition on referencing economic impacts thus is plainly unlawful and manifestly contrary to the statute, undermining Congress’s goal of improving and expediting the listing process. 5 U.S.C. § 706(2)(A), (C); *Chevron*, 467 U.S. at 843; *Motor Vehicle Mfrs.*, 463 U.S. at 43. The proposal does not merely “more closely align [the regulation] with the statutory language,” as the Services claim. 83 Fed. Reg. at 35,194. Although the Services contend that biological considerations will continue to be the basis for listing decisions, they themselves acknowledge that they may under their new proposal, actually “reference[] economic, or other, impacts”—a factor Congress expressly provided they *not* consider—in their listing decisions. 83 Fed. Reg. at 35,194; *see also id.* at 35,195. It is difficult to believe that the Services and commenters will not *consider* economic impact information even as the Services generate and “reference[]” it during the listing stage. *Id.* at 35,194 (emphasis added). And it is unclear what purpose it could serve for the Services to spend time and resources generating economic impact information if they were not going to consider the data.

In any event, that proposed process of compiling and presenting cost-benefit analyses itself runs counter to Congress’s intent to “improv[e] and expedit[e]” the listing process, *even if* the Services counterintuitively intend to ignore it. H.R. REP. NO. 97-567, at 12 (1982); S. REP. NO. 97-418, at 4 (1982). The Services nowhere even acknowledge, let alone justify, the added burden, backlog, and delay these economic impact analyses will create for the Services, thus “fail[ing] to consider an important aspect of the problem.”<sup>27</sup> *Motor Vehicle Mfrs.*, 463 U.S. at 43. Nor do the Services explain what “circumstances” would warrant “referenc[ing]” economic

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<sup>24</sup> *See, e.g., Alabama-Tombigbee Rivers Coal. v. Kempthorne*, 477 F.3d 1250, 1266 (11th Cir. 2007); *N.M. Cattle Growers Ass’n v. U.S. Fish and Wildlife Serv.*, 248 F.3d 1277, 1284-85 (10th Cir. 2001); *Ariz. Cattle Growers’ Ass’n v. Kempthorne*, 534 F. Supp. 2d 1013, 1035 (D. Ariz. 2008).

<sup>25</sup> *See also* H.R. REP. NO. 97-567, at 11-12 (1982); H.R. CONF. REP. NO. 97-835, at 20 (1982) (“[E]conomic considerations have no relevance to determinations regarding the status of species.”); S. REP. NO. 97-418, at 4, 11 (1982).

<sup>26</sup> *See also* S. REP. NO. 97-418, at 4 (1982) (1982 amendments “would ensure that . . . economic analysis . . . will not delay or affect decisions on listing”); *id.* at 11.

<sup>27</sup> *See* U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-17-304, ENVIRONMENTAL LITIGATION: INFORMATION ON ENDANGERED SPECIES ACT DEADLINE SUITS, pp.5-18 (Feb. 2017) (hereinafter “GAO Listing Deadline Litigation Report”) (reporting that 141 lawsuits involving 1,441 species were filed from fiscal year 2005 through 2015 alleging that FWS and NMFS failed to take actions within deadlines mandated by ESA section 4, largely on petitions to list species), *available at* <https://www.gao.gov/assets/690/683058.pdf>; *see also In re Endangered Species Act Section 4 Deadline Litig.-MDL No. 2165*, 704 F.3d 972, 975 (D.C. Cir. 2013) (describing backlog of listing decisions).

impacts or how they plan to quantify the potential costs and benefits of listing decisions, a particularly challenging task where they lack the requisite resources and expertise to do so and where, as discussed above, “[t]he value of [species and our] genetic heritage is, quite literally, incalculable.” *Hill*, 437 U.S. at 178-79 (quoting H.R. REP. No. 93-412, at 4-5 (1973)); *cf. id.* at 187-88 (“Quite obviously, it would be difficult for a court to balance the loss of a sum certain—even \$100 million—against a congressionally declared ‘incalculable’ value, even assuming we had the power to engage in such a weighing process, which we emphatically do not.”).

Second, the Services do not, and cannot, offer any reasoned basis for their economic-impact proposal. The Services may not lawfully resort to their stated goal of informing the public about the potential costs and benefits of implementation in order to comply with Congress’s unspecified “support for informing the public as to the impacts of regulations in subsequent amendments to statutes and executive orders.” 83 Fed. Reg. at 35,195. Whatever the content of those vaguely referenced authorities, they do not authorize the Services to evade the ESA’s specific prohibition on the inclusion of economic impacts in listing determinations. 16 U.S.C. § 1533(b)(1)(A); *cf. Am. Bicycle Ass’n v. United States*, 895 F.2d 1277, 1279-80 (9th Cir. 1990) (general grant of authority does not override “specific and unequivocal” proscription). In fact, as the Services themselves acknowledge, 83 Fed. Reg. at 35,194, Congress originally added the term “solely” to the ESA out of concern that those same types of authorities, like the Regulatory Flexibility Act and Paperwork Reduction Act, potentially could be used to introduce economic and other factors into listing determinations under the Act. *See, e.g.,* H.R. CONF. REP. No. 97-835, at 20 (1982) (explaining that “economic analysis requirements of Executive Order 12,291, and such statutes as the Regulatory Flexibility Act and the Paperwork Reduction Act, *will not apply* to any phase of the listing process” (emphasis added)). For these reasons, too, the Services’ attempt to analogize listing determinations to the entirely distinct standard-setting processes under the federal Clean Air Act is simply inapt. 83 Fed. Reg. at 35,194-95. Because the Services’ economic-impact proposal is thus both unlawful and unjustified, it should be withdrawn.

## **ii. Redefinition of Foreseeable Future.**

The Listing Rule’s second proposed change would narrow the definition of “threatened species” under the ESA, which includes a species “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” 16 U.S.C. § 1532(20). The proposal, if adopted, would for the first time embed quantitative probability into the term “foreseeable future,” providing that the term would “extend[] only so far into the future as the Services can reasonably determine that the conditions potentially posing a danger of extinction . . . are *probable*.” 83 Fed. Reg. at 35,195, 35,201 (emphasis added). This approach would allow the Services in listing decisions to “explain the extent to which they can reasonably determine that both the future threats and the species’ responses to those threats are *probable*” and to “tak[e] into account considerations such as the species’ life-history characteristics, threat-projection timeframes, and environmental variability” in that analysis. *Id.* at 35,195 (emphasis added). These proposed changes are not only contrary to the statutory language of the ESA, but they also improperly constrain the Services’ consideration of future threats to a species’ continued existence, including threats related to climate change, without any reasoned basis.

First, the Services' injection of these "probability" and "variability" criteria into the threatened species analysis violates the text and purposes of the ESA. The ESA requires the Services to make its listing determinations "solely on the basis of the best scientific and commercial data available . . . after conducting a review of the status of the species," 16 U.S.C. § 1533(b)(1)(A), based on threats to the species, *id.* § 1533(a)(1). As the Services admit, this analysis must be done on a case-by-case basis and is "uniquely related to the particular species, the relevant threats, and the data available." 83 Fed. Reg. at 35,195 (citing *In re Polar Bear Endangered Species Act Listing and Section 4(d) Rule Litig.*, 709 F.3d 1, 15-16 (D.C. Cir. 2013)). After that assessment, if the Services find it likely that a species will "become an endangered species within the foreseeable future throughout all or a significant portion of its range," they must list that species as threatened. 16 U.S.C. § 1532(20); *see id.* § 1533(b)(1)(B)(ii).

In enacting the ESA, Congress did not define "foreseeable future" or prescribe standards regarding the "likelihood" that a species would become endangered and thus require the Act's protection. The proposed rule's use of the word "probable," however, raises the specter that the Services may only consider threats that have a fifty percent or greater chance of occurring during a particular time period. It is difficult to imagine—and the Services have failed to explain—how they would reliably quantify the percentage likelihood of threats to species. And, even if quantification were possible, it would be unlawful and arbitrary to discount severe threats that may be, say, 40% likely but would be extremely dangerous. Such an approach also would be inappropriate for species that may be facing severe or multiple threats that may have a lower chance of occurring or for which the likelihood cannot be precisely calculated and is contrary to the Services' longstanding precautionary approach. *Cf.* 48 Fed. Reg. 43,098, 43,102-03 (Sept. 21, 1983) (FWS guidelines for reclassification from threatened to endangered status based on magnitude and immediacy of threats). Simply put, the Services' new, *ultra vires* requirements inject criteria for quantification and certainty that are not required by the Act and will most likely limit listing decisions, even where potential threats could be devastating. It is thus contrary to section 4 of the ESA, the overriding conservation purposes of the ESA, and the policy of "institutionalized caution" embedded in the Act. *See* 16 U.S.C. § 1531(b); *Hill*, 437 U.S. at 194.

Courts also have held that the ESA does not mandate that the Services base their decisions "on ironclad evidence when it determines that a species is likely to become endangered in the foreseeable future; it simply requires the agency to consider the best and most reliable scientific and commercial data and to identify the limits of that data when making a listing determination." *Alaska Oil & Gas Ass'n v. Pritzker*, 840 F.3d 671, 681 (9th Cir. 2016).<sup>28</sup> In *Pritzker*, for example, the Ninth Circuit upheld NMFS's decision to list the Pacific bearded seal (*Erignathus barbatus nauticus*) as a threatened species based on its determination, using several climate models, that the loss of sea ice over shallow waters in the Arctic would leave the species endangered by the year 2095. *Id.* at 674. The Court specifically rejected plaintiffs' contention that the climate models "cannot reliably predict the degree of global warming beyond 2050 or the effect of that warming on a subregion, such as the Arctic." *Id.* at 679. "The fact that climate projections for 2050 through 2100 may be volatile," the Court explained, "does not deprive those

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<sup>28</sup> *See also Alaska Oil & Gas Ass'n v. Jewell*, 815 F.3d 544, 558-59 (9th Cir. 2016); *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581, 602 (9th Cir. 2014); *In re Polar Bear Litig.*, 709 F.3d at 16.



projections of value in the rulemaking process” where the Services have used a reasonable methodology for addressing that volatility and explained its shortcomings. *Id.* at 680. Under the Services’ proposed redefinition here, however, rather than making a reasoned determination based on the best scientific and commercial data available such as climate modeling, NMFS would have been required to show that “the future threats and the species’ responses to those threats are probable,” *e.g.*, more likely than not—a standard contrary to the precautionary Act and case law. *See* 83 Fed. Reg. at 35,201.

Thus, perhaps most problematically, the Services’ proposed definition would give the Services carte blanche to ignore “an important aspect of the problem” of species extinction: the significant threats posed by climate change. *See Motor Vehicle Mfrs.*, 463 U.S. at 43. As noted above, in addition to its new *ultra vires* probability requirement, the Services, using code words for climate change, also direct that the foreseeable future analysis now should “account for any relevant environmental variability, such as hydrological cycles or oceanographic cycles, which may affect the reliability of projections” and “consider the timeframes applicable to the relevant threats and to the species’ likely responses to those threats in view of its life-history characteristics.” 83 Fed. Reg. at 35,195.

These new “probability” and “variability” criteria may have the perverse effect of enabling the Services to discount the potentially devastating effects of climate change. The fact that climate change is occurring and will have impacts on habitat is more than “probable;” it is certain. But the precise impact that climate change might have on particular areas at particular times may be uncertain as there might be several varying, perfectly plausible projections of effects that climate change might have on a particular habitat that could predict somewhat different impacts at different times. It may be that none of those specific projections reaches the fifty percent “probability” threshold because of uncertainty due to environmental variability, but each threat must nonetheless be considered in assessing the “likelihood” that a species will become endangered. Indeed, as the previous Director of FWS recently testified before Congress, the Earth’s rapidly changing climate is one of the principal emerging threats to species nationwide—variability notwithstanding.<sup>29</sup> Scientific research confirms that climate change already is, and over the next several decades will increasingly become, a driver of species decline and biodiversity loss.<sup>30</sup> And the severity of this threat is already apparent to State

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<sup>29</sup> *See* Testimony of Dan Ashe, Dir., FWS, Dep’t of the Interior, Before the U.S. House of Reps., Comm. on Oversight and Gov. Reform, Subcomm. on Interior, Regarding Barriers to Recovery and Delisting of Listed Species Under the Endangered Species Act of 1973 (Apr. 21, 2016), *available at* <https://www.doi.gov/ocl/esa-delisting>; *see also, e.g.*, National Park Serv., “Climate Change Endangers Wildlife” (June 3, 2018) (noting “estimate[s] that 35% of animals and plants could become extinct in the wild by 2050 due to global climate change”), *available at* [https://www.nps.gov/pore/learn/nature/climatechange\\_wildlife.htm](https://www.nps.gov/pore/learn/nature/climatechange_wildlife.htm).

<sup>30</sup> *See, e.g.,* Céline Bellard, *et al.*, *Impacts of Climate Change on the Future of Biodiversity*, 15 *ECOLOGY LETTERS* 365, 375 (2012) (most climate change impact models “indicate alarming consequences for biodiversity, with the worst-case scenarios leading to extinction rates that would qualify as the sixth mass extinction in the history of the earth”), *available at* <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1461-0248.2011.01736.x>; Paul Leadley *et al.*, *Biodiversity Scenarios: Projections of 21st Century Change in Biodiversity and Associated Ecosystem Services*, CONVENTION ON BIOLOGICAL DIVERSITY TECHNICAL SERIES NO. 50 (2010); *see also* U.S. Dep’t of the Interior, *9 Animals That are Feeling the Impacts of Climate Change* (Nov. 16, 2015) (climate

agencies studying climate impacts on biodiversity and species conservation<sup>31</sup> and planning for endangered and threatened species conservation.<sup>32</sup>

Thus, even in the face of evolving threats, the Services must still consider and act on the best available science in evaluating threats to a species. *See Center for Biological Diversity v. Zinke*, 900 F.3d 1053, 1072 (9th Cir. 2018) (FWS must explain why uncertainty of climate change favors not listing the arctic grayling given evidence of warming water temperatures and decreasing water flow); *Greater Yellowstone Coal. Inc. v. Servheen*, 665 F.3d 1015, 1028 (9th Cir. 2011) (“It is not enough for the [FWS] to simply invoke ‘scientific uncertainty’ to justify its action.”). But far from considering, as it must, the threat of climate change, the Services under their proposed redefinition could arbitrarily cite climate change as a justification *to avoid* species protections altogether. *See Motor Vehicle Mfrs.*, 463 U.S. at 43.

What is more, the Services again fail to provide any reasoned explanation for this significant change. They attempt to justify the proposal solely by reference to a 2009 opinion from the Department of the Interior’s Office of the Solicitor (“2009 Guidance”),<sup>33</sup> which they claim is “well-founded” and “has been widely applied by both Services.” 83 Fed. Reg. at 35,195. But the 2009 Guidance does not even contain the word “probable.” *See generally* 2009 Guidance. It simply recognizes the unremarkable proposition that the Services have discretion to make listing determinations based on “the facts applicable to the species being considered,” provides direction to base such determinations on “reliable” predictions that are “sufficient to provide a reasonable degree of confidence in the prediction, in light of the conservation purposes of the Act,” and acknowledges that “[s]ince the foreseeable future is uniquely related to population, status, trends, and threats for each species and since species often face multiple threats, the Secretary is likely to find varying degrees of foreseeability with respect to the various threats.” *Id.* at 13. None of this guidance affords the Services discretion to ignore reasonably foreseeable threats to species based solely on uncertainty. To the contrary, and consistent with the case law, the 2009 Guidance recognizes that the Services must sometimes make listing decisions extrapolating from limited data, always mindful of the conservation purposes of the

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change threatens endangered and threatened species, including loggerhead and other sea turtles, polar bears, and piping plovers), available at <https://www.doi.gov/blog/9-animals-are-feeling-impacts-climate-change>.

<sup>31</sup> *See generally, e.g.*, CAL. BIODIVERSITY INITIATIVE: A ROADMAP FOR PROTECTING THE STATE’S NATURAL HERITAGE (Sept. 2018), available at <http://opr.ca.gov/docs/20180907-CaliforniaBiodiversityActionPlan.pdf>; MASS. DIV. OF FISHERIES & WILDLIFE AND MANOMET CTR. FOR CONSERVATION SCIENCES, 2 CLIMATE CHANGE AND MASSACHUSETTS FISH AND WILDLIFE: HABITAT AND SPECIES VULNERABILITY (updated Feb. 2018), available at <https://www.cakex.org/documents/climate-change-and-massachusetts-fish-and-wildlife-volume-2-habitat-and-species>; MICHELLE D. STAUDINGER, ET AL., DEP’T OF THE INTERIOR NORTHEAST CLIMATE SCI. CTR., INTEGRATING CLIMATE CHANGE INTO NORTHEAST AND MIDWEST STATE WILDLIFE ACTION PLANS (2015), available at <http://necsc.umass.edu/biblio/integrating-climate-change-northeast-and-midwest-state-wildlife-action-plans>.

<sup>32</sup> *See, e.g.*, HABITAT CONSERVATION PLAN FOR PIPING PLOVER, *supra* note 12, at 2-10 to 2-11 (continued recovery threatened by habitat loss from sea level rise caused by climate change).

<sup>33</sup> Memorandum from Solicitor, U.S. Dep’t of the Interior, to Acting Director, FWS, No. M-37021 (Jan. 16, 2009), available at <https://www.doi.gov/sites/doi.opengov.ibmcloud.com/files/uploads/M-37021.pdf>.

Act. *Id.* at 13, 15-16. The Listing Rule's proposed requirement that such threats be "probable" would unlawfully and arbitrarily foreclose that approach and should be withdrawn.

### iii. Elimination of Recovery from Delisting.

The Listing Rule's third major proposed change would modify the language in 50 C.F.R. § 424.11(d) to provide that, when determining whether to delist species, the Services must apply the same five factors for listing species under ESA section 4(a)(1), 16 U.S.C. § 1533(a)(1); *see also* 50 C.F.R. § 424.11(c), eliminating current regulatory language that refers to species recovery as key basis for delisting, 83 Fed. Reg. at 35,196, 35,201; *see* 50 C.F.R. § 424.11(d)(2). Again, the Services' proposed changes are contrary to the Act and its legislative history and are arbitrary and capricious.

First, the proposed delisting changes violate the ESA and its intent. The Act plainly states that its species conservation measures are intended to "bring any endangered species or threatened species to the point at which the measures provided pursuant to this [Act] are no longer necessary." 16 U.S.C. § 1532(3). In other words, as the Ninth Circuit has explained, "the ESA was enacted not merely to forestall the extinction of species (*i.e.*, promote a species survival), but to allow a species to recover to the point where it may be delisted." *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Serv.*, 378 F.3d 1059, 1070 (9th Cir. 2004). Thus, the ESA specifically requires the Services to develop and implement recovery plans "for the conservation and survival of endangered species and threatened species listed pursuant to this section, unless [they] find[] that such a plan will not promote the conservation of the species." 16 U.S.C. § 1533(f)(1). Among other things, those plans must include "to the maximum extent practicable . . . objective, measurable criteria which, when met, would result in a *determination*, in accordance with the provisions of this section, *that the species be removed from the list.*" *Id.* § 1533(f)(1)(B)(ii) (emphases added).

The ESA's legislative history confirms its clear focus on species recovery. Congress added these procedures in 1988 to prioritize this important goal of the ESA and to remedy the Services' failures to prepare adequate recovery plans for listed species. *See* S. REP. No. 100-240, at 4, 9 (1987). The amendments were intended to ensure that each recovery plan "contain[s] objective, measurable criteria for removal of a species from the Act's lists and timeframes and cost estimates for intermediate steps toward that goal [to] . . . provide a means by which to judge the progress being made toward recovery." *Id.* at 9. The Act and its legislative history thus make plain that recovery must be the paramount concern in delisting decisions.

Elimination of recovery considerations in the delisting process would fail to ensure that listed species have become secure members of their ecosystems prior to removing the Act's protections. In particular, the proposed factors in ESA section 4(a)(1) do not discuss recovery and would not necessarily result in a determination whether threats to the species have been eliminated or controlled, or whether the population size is stable and trending in a positive direction. *See* 16 U.S.C. § 1533(4)(a)(1); 50 C.F.R. § 424.11(c). Consequently, the Services' proposal could result in the premature delisting of species that are not yet likely to recover, in direct violation of the conservation purposes of the Act.

Furthermore, the Services have failed to provide any reasoned explanation for this proposed change, which departs significantly from its longstanding practice. *See Fox*, 556 U.S. at 515. Even if recovery plans prepared under section 4(f) are not “binding” on the Services or do not require the Services to find that “all of the recovery plan criteria had been met before it could delist” a species, the Services cannot justify disregarding species recovery in the delisting process altogether. *See* 83 Fed. Reg. at 35,196 (emphasis added). In fact, even in the case referenced by the Services, *Friends of the Blackwater v. Salazar*, 691 F.3d 428 (D.C. Cir. 2012), FWS did consider recovery in its delisting decision for the West Virginia northern flying squirrel. *See id.* at 431 (discussing the Service’s analysis of the recovery plan for the species and its consideration of data provided pursuant to the plan); 73 Fed. Reg. 50,226 (Aug. 26, 2008) (delisting “due to recovery”); 71 Fed. Reg. 75,924 (Dec. 19, 2006) (same). Consequently, proposal to eliminate species recovery as a factor in delisting decisions should be withdrawn, and the Services should retain the current regulatory language in 50 C.F.R. § 424.11(d)(2) regarding species recovery in the delisting process.

#### **iv. Expanding the Limited “Not Prudent” Exception to Critical Habitat Designation.**

The Listing Rule also proposes to expand the circumstances “in which the Services may find it is not prudent to designate critical habitat” for listed species, and thus elect not to do so, by replacing the existing two narrow circumstances in which designation would not be prudent with a non-exhaustive list of five such situations. 83 Fed. Reg. at 35,196, 35,201.<sup>34</sup> The Services’ proposal would dramatically expand an expressly and intentionally narrow exception to the Act’s important critical habitat designation requirements in violation of the Act and its purpose, and without any reasoned basis. It, too, should be withdrawn.

First, the Services’ proposal to expand the so-called “not prudent exception” is contrary to the ESA, Congress’s clear intent, and case law. The Act requires that the Services, when listing a species as threatened or endangered, also designate “to the maximum extent prudent and determinable” the habitat that “is then considered to be critical,” 16 U.S.C. §§ 1533(a)(3)(A) (emphasis added), *i.e.*, “essential to the conservation of the species,” *id.* § 1532(5)(A). Recognizing that “the greatest [threat to species] [is] destruction of natural habitats,” *Hill*, 437 U.S. at 179, Congress intended that such designations be made concurrently with listing determinations, except in “rare circumstances” when designation “would not be beneficial to the species,” H.R. REP. NO. 95–1625 at 17 (1978).<sup>35</sup> Consistent with the Act’s plain text and history, courts, in turn, have construed the “not prudent” exception as a “narrow statutory exception” to the general rule that critical habitat must be designated for imperiled species. *Natural Res. Def. Council v. U.S. Dep’t of the Interior*, 113 F.3d 1121, 1126 (9th Cir. 1997).<sup>36</sup>

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<sup>34</sup> *See* 50 C.F.R. § 424.12(a)(1).

<sup>35</sup> H.R. REP. NO. 95–1625 at 17 (1978) (“The committee intends that in most situations the Secretary will, in fact, designate critical habitat at the same time that a species is listed as either endangered or threatened. It is only in rare circumstances where the specification of critical habitat concurrently with the listing would not be beneficial to the species.”).

<sup>36</sup> *See also Conservation Council for Hawai’i v. Babbitt*, 2 F. Supp. 2d 1280, 1283 (D. Haw. 1998) (rejecting FWS’s rationales for not designating critical habitat for 245 listed plant species and noting that critical habitat should be designated “in all but rare cases”).

In line with that authority, the Services' current regulations list only two situations in which a critical habitat designation is not prudent: where identifying critical habitat would risk harm to the species or where such designation would not benefit the species because, for example, habitat destruction is not a threat to the species. 50 C.F.R. § 424.12(a)(1). And courts have interpreted those two exceptions narrowly, rejecting unsubstantiated attempts to avoid designation. *See Sierra Club v. U.S. Fish and Wildlife Serv.*, 245 F.3d 434, 443 (5th Cir. 2001) (condemning Services' practice of "invert[ing] [Congressional] intent, rendering critical habitat designation the exception and not the rule"); *Natural Res. Def. Council*, 113 F.3d at 1126. The Services' Listing Rule would undermine the ESA's critical habitat scheme and its court-confirmed purpose, creating a laundry list of new extra-statutory "not prudent" exceptions and paving the way for the Services to avoid designating critical habitat, as detailed below.

Second, the Services' unlawful new exceptions are each arbitrary and capricious, lacking any reasoned basis. *Motor Vehicle Mfrs.*, 463 U.S. at 43. Most problematically, *exception (v)* broadly authorizes invocation of the "not prudent" exception if "the Secretary otherwise determines that designation of critical habitat would not be prudent." 83 Fed. Reg. at 35, 201; *see also id.* at 35, 197. The exception is an overbroad and vague "catchall" that would give unfettered discretion to the Services to evade the Act's core critical habitat requirements—an authority not contemplated by the ESA. *Motor Vehicle Mfrs.*, 463 U.S. at 43. The Services *nowhere* explain this proposed, substantial expansion of the exception, which would swallow the rule that the "not prudent" determinations should be extremely rare.<sup>37</sup>

*Exception (ii)* arbitrarily expands the "not prudent" exception to cover circumstances in which "threats to the species habitat stem solely from causes that cannot be addressed through management actions resulting from [section 7] consultations." 83 Fed. Reg. at 35, 201; *see also id.* at 35, 197. This exception apparently aims directly at precluding critical habitat designations based on threats to a species from climate change—a "cause" that cannot be "addressed" solely through the management actions of the Services and the jurisdictions in which critical habitat lies, but rather requires concerted action at the local, state, federal, and international level. The proposal arbitrarily assumes, with virtually no explanation, that the value of a critical habitat designation depends on whether management actions identified through interagency consultations can address threats to a species' habitat. *Id.* at 35, 197. But the ESA simply does not require that effective consultation actions be available for critical habitats to be designated; it separately requires *both* critical habitat designation *and* consultation. 16 U.S.C. §§ 1533(a)(3)(A), 1536; *cf. Natural Res. Def. Council*, 113 F.3d at 1126 (rejecting Services' rationale that designating critical habitat would not be prudent because the bulk of the species' habitat was located on private lands).

Additionally, there are significant substantive and procedural benefits that result from the designation of critical habitat outside of the consultation requirements, including educating the public and state and local governments about the importance of certain areas to listed species, assisting in species recovery planning efforts, identifying areas where agency consultation will be required, and "establish[ing] a uniform protection plan prior to consultation." *Conservation*

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<sup>37</sup> *Fox*, 556 U.S. at 515 (agency must provide "good reasons" for policy change); *National Cable & Telecomms. Ass'n*, 545 U.S. at 981 ("unexplained inconsistency" is basis for invalidation).

*Council for Hawai'i v. Babbitt*, 2 F. Supp. 2d 1280, 1288 (D. Haw. 1998).<sup>38</sup> Indeed, the Services themselves acknowledge as much. 83 Fed. Reg. at 35,197. In light of these myriad benefits of critical habitat outside of the section 7 requirements, far from justifying an exception to critical habitat designations as the Services appear to claim, *id.*, the threat of climate change casts in stark relief the importance of such designations to ensure robust understanding of and protections for the many species it threatens.

*Exception (iii)* allows areas within the United States to be excluded from critical habitat designations if they would provide “no more than negligible conservation value” to species “occurring primarily outside” the United States. *Id.* at 35,201; *see also id.* at 35,197. The Services fail to explain what they mean by “negligible conservation value” or how they would determine whether a species “occur[s] primarily” elsewhere, injecting more vague and subjective loopholes into the designation analysis and depriving the public of a meaningful opportunity to comment. *Home Box Office*, 567 F.2d at 35 (notice must “disclose in detail the thinking that has animated the form of a proposed rule and the data upon which that rule is based,” to afford meaningful opportunity for comment). Further, the exception fails to appreciate that a designation within the United States could still be beneficial and protect habitat that is important for the species’ survival and recovery, particularly for migratory species.

The Services cannot save their *ultra vires* proposal based on their stated intention to “reduce the burden of regulation” or their passing assurance that “not-prudent determinations would continue to be rare.” 83 Fed. Reg. at 35,197. The Listing Rule on its face adds several new and extremely broad exceptions to the ESA’s critical habitat mandate and, in practice, would give the Services carte blanche to forego critical habitat designation, particularly where climate change threatens species’ habitat. Accordingly, the Listing Rule’s proposed exceptions must be abandoned.

#### **v. Restricting Unoccupied Critical Habitat Designation.**

The Listing Rule also proposes to “clarify” when areas not yet occupied by the endangered or threatened species (“unoccupied areas”) are “essential for the conservation of the species” and thus warrant designation as critical habitat. *Id.* at 35,198, 35,201. The proposal is not a mere clarification; it torpedoes the ESA’s critical habitat designation process by arbitrarily demoting unoccupied habitat without regard to the effects of climate change, delaying the time at which occupied areas are identified, and creating a laundry list of arbitrary new factors the Services can invoke to evade critical habitat designation, including at the behest of private landowners. *Id.* Like the other proposals, it must be withdrawn.

**Prioritizing, and Delaying Determinations of, Occupied Critical Habitat.** The proposed rule would restrict designation of unoccupied critical habitat by requiring the Services first to evaluate whether currently occupied areas are inadequate for species conservation—without explaining how the Services would make that determination—using occupation at the time of critical habitat designation (and not the listing decision) as the point of reference. *Id.* at 35,198, 35,201. As an initial matter, as the Services themselves recently concluded, there is no basis in

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<sup>38</sup> *See also* 81 Fed. Reg. 7,414, 7,414-15 (Feb. 11, 2016) (Services’ own statement describing “several ways” that critical habitat “can contribute to the conservation of listed species”).

the statute or legislative history for the Services to evaluate occupied areas before considering unoccupied areas.<sup>39</sup> The ESA expressly requires the Services to consider *both* occupied and unoccupied habitat in designating critical habitat. 16 U.S.C. § 1532(5)(A). By arbitrarily elevating occupied critical habitat to the preferred and default designation option, this proposal would discount the importance of previously occupied habitat to species recovery. If a species has reached the point of becoming endangered or threatened, it is quite likely that it no longer occupies habitat that it once occupied. Indeed, the Act's critical habitat provisions are intended to address that reality. *See Hill*, 437 U.S. at 179. It thus would flout the Act's recovery purpose to look first at the narrowed range of habitat currently occupied by the species rather than areas within its historical range.

What is more, this proposal too would permit the Services to avoid addressing the effects of climate change, allowing the Services to ignore unoccupied areas that could provide important habitat in a changing climate. We are already seeing an unprecedented migration of plant and animal species into new areas as a result of climate change.<sup>40</sup> As the Services recently explained, “[a]s the effects of global climate change continue to influence distribution and migration patterns of species, the ability to designate areas that a species has not historically occupied is expected to become increasingly important” to ensure connectivity between habitats and protect movement corridors and emerging habitat for species experiencing range shifts in latitude or altitude. 81 Fed. Reg. at 7,435; *see also* 83 Fed. Reg. 42,362, 42,365 (Aug. 21, 2018) (designating unoccupied critical habitat for three plant species to allow for expansion of the species’ range and the reintroduction of individuals into areas where the species historically occurred, and to provide areas for recovery); *cf. Conservation Council for Hawai’i*, 2 F. Supp. 2d at 1288. The Services’ proposal does not at all contend with this important consideration. *See Motor Vehicle Mfrs.*, 463 U.S. at 43.

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<sup>39</sup> 81 Fed. Reg. at 7,426-27 (emphasizing that “there is no suggestion in the legislative history that the Services were expected to exhaust occupied habitat before considering whether any unoccupied areas may be essential” and “no specific language in the Act that requires the Services to first prove that the inclusion of all occupied areas in a designation are insufficient to conserve the species before considering unoccupied areas”).

<sup>40</sup> *See Céline Bellard, et al., Impacts of Climate Change on the Future of Biodiversity, supra* note 30, at 367 (“[R]ange shifts have . . . been observed [for] more than 1,000 species.”); Robert A. Robinson, *et al., Travelling Through a Warming World: Climate Change and Migratory Species*, 7 ENDANGERED SPECIES RESEARCH 87, 95 (2009) (migrating species are responding to climate change by altering their ranges and “it will be important to protect areas that may be used in the future,” at the edge or beyond current ranges); Thomas T. Moore, *Climate Change and Animal Migration*, 41 ENVTL. L. 393, 405 (2011) (climate change may cause migration corridors and destinations to shift out of protected areas). Among imperiled marine species with migration affected by climate change, the critically endangered North Atlantic right whale (*Eubalaena glacialis*) has been foraging farther north because of changed zooplankton distributions due to warming in the Gulf of Maine and, in winter, spending more time in Mid-Atlantic waters and less time in calving grounds off the southeastern U.S. coast. *See* Sean A. Hayes, *et al.*, U.S. DEP’T OF COMMERCE, NOAA TECHNICAL MEMORANDUM NMS NE-247, NORTH ATLANTIC RIGHT WHALES – EVALUATING THEIR RECOVERY CHALLENGES IN 2018 (2018) (citing multiple studies). With fewer than 450 North Atlantic right whales left in existence, unmitigated climate impacts could drive the species to extinction.

Finally, the requirement that occupied habitat be assessed at the time of critical habitat designation conflicts with the ESA's directive that the Services designate critical habitats "to the maximum extent prudent and determinable . . . *concurrently* with making a [listing] determination." 16 U.S.C. § 1533(a)(3)(A) (emphasis added). In other words, the ESA makes clear that habitat assessments should occur at time of listing. But the Services often do not designate critical habitat on time, at the time of listing.<sup>41</sup> Thus, by prioritizing occupied habitat and assessing occupation at the most likely later point of critical habitat designation, the Services will likely designate even less habitat where species populations have already dwindled in the intervening time, again arbitrarily omitting previously occupied habitat for imperiled species. To comport with the ESA's approach of "institutionalized caution," the Services must instead base designations on data from *both* the time of listing *and* critical habitat designation, considering both occupied and unoccupied areas concurrently. *See Hill*, 437 U.S. at 194.

**Definition of Unoccupied Critical Habitat.** Second, the Services dramatically redefine and substantially narrow when unoccupied areas will be considered "essential for the conservation of the species." 16 U.S.C. § 1532(5)(A)(ii). Specifically, the proposed rule would create a two-factor test that would allow designation of unoccupied critical habitat only if (1) the currently occupied area, as discussed above, is (a) "inadequate to ensure the conservation of the species" or (b) "result[s] in less-efficient conservation of the species," *and* (2) "there is a reasonable likelihood that the [unoccupied] area will contribute to the conservation of the species" as determined through three new "area-specific factors." 83 Fed. Reg. at 35,198, 35,201. To be sure, habitat should not be designated as critical unless it has some likelihood of contributing to the conservation of the species. But this proposal's sweeping two-step test would veer far beyond that threshold. Rather than promote "flexibility," *id.* at 35,198, it would upend the regulatory scheme and give the Services virtually unlimited discretion to refuse to designate unoccupied critical habitat based on almost any conceivable non-biological rationale, contrary to the conservation purpose of the Act in general and its critical habitat provisions in particular and to the great detriment of imperiled species.

The *first step* requires the Services to assess whether occupied areas are providing adequate and efficient conservation for the species. *Id.* at 35,198. Broadly speaking, as discussed above, there is no basis in the Act or in the legislative history for the Services to elevate occupied critical habitat as the default designation option. 16 U.S.C. § 1532(5)(A). Further, even if the Act allowed the Services to consider occupied areas before making an unoccupied critical habitat designation, the first step of this two-part test does not provide clear guidance for how occupied areas should be assessed. For instance, the Services state that "efficient conservation" "refers to situations where the conservation is effective, *societal conflicts* are minimized, and *resources expended* are commensurate with the benefit to the species." 83 Fed. Reg. at 35,198 (emphases added). But the Services fail to explain what the term "societal conflicts" means, and the proposal is therefore fatally vague, precluding meaningful opportunity for comment. *See Horsehead Res. Dev. Co. v. Browner*, 16 F.3d 1246, 1268 (D.C. Cir. 1994). Thus unexplained, the term "societal conflicts" also is overly broad, extending well beyond the economic impacts the ESA permits the Services to consider. 16

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<sup>41</sup> *See, e.g., Alabama-Tombigbee Rivers Coal.*, 477 F.3d at 1268 ("We are troubled by the Service's apparent practice of routinely delaying critical habitat designation until forced to act by court order.").



U.S.C. § 1533(b)(2).<sup>42</sup> Additionally, the alluded to “resource expenditure” analysis gives the Services unlawfully broad discretion to determine that the benefits of a critical habitat designation may not be worth the cost, with virtually no guidance. The proposal thus would significantly limit the circumstances under which the Services would designate an unoccupied critical habitat, contrary to the Act’s equal concern for both occupied and unoccupied areas and the ESA’s overarching species-recovery goals. 16 U.S.C. § 1532(5)(A).

The *second step* of the Listing Rule’s two-part test—requiring a “reasonable likelihood that the [unoccupied] area will contribute to the conservation of the species”—is likewise unsupported by law and arbitrary. 83 Fed. Reg. at 35,198. The proposal adds three area-specific factors for the Services to consider when making a “reasonable likelihood” determination, two of which are plainly contrary to the ESA: (a) “whether the area is currently or is likely to become usable habitat for the species,” and (b) whether any “federal agency actions are likely to be proposed with respect to the area” (*i.e.*, whether interagency consultation will be triggered). *Id.*

The first area-specific factor—whether unoccupied area is *usable* given the “current state of the area,” the “extent to which extensive restoration would be needed,” and whether this restoration is “likely” by current landowners or managers, *id.*—arbitrarily bases critical habitat designations on landowner whim in violation of the ESA and its purposes and ignores the many benefits of critical habitat designations, *see Conservation Council for Hawai’i*, 2 F. Supp. 2d at 1288. Critical habitat designations must be based on the “best scientific data available” and are not subject to a private-landowner exception. 16 U.S.C. § 1533(b)(2).

To be sure, the States recognize that the designation of private land as critical habitat can raise difficult issues. But this proposal is antithetical to the ESA’s biological focus and conservation purpose. It would allow “private landowners [to] trump the Service’s scientific determination that unoccupied habitat is essential for the conservation of a species so long as they declare that they are not currently willing to modify habitat to make it habitable and that they will not be willing to make modifications in the foreseeable future.” *Markle Interest, L.L.C. v. U.S. Fish and Wildlife Serv.*, 827 F.3d 452, 470 (5th Cir. 2016) (rejecting argument that ESA authorizes “private landowner exemption from unoccupied critical-habitat designations”), *cert. granted*, *Weyerhaeuser Co. v. U.S. Fish and Wildlife Serv.*, 138 S. Ct. 924 (2018). Moreover, the suggestion that landowners can prevent critical habitat designation simply by expressing hostility to the idea would diminish, rather than promote, landowner cooperation and participation in recovery efforts. We encourage the Services instead to identify ways to create incentives for landowners to participate in conservation and recovery.

The second area-specific factor—whether an unoccupied area will *trigger interagency consultation*, 83 Fed. Reg. at 35,198—arbitrarily and without explanation assumes that consultation is a prerequisite to the conservation value of species’ habitat. Without any basis in the statute or fact, the Services claim that “the likelihood that an area will contribute to conservation is, in most cases, greater for public lands and lands for which . . . federal actions can be reasonably anticipated than for other types of land,” admitting their intent largely to

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<sup>42</sup> In addition, it is unclear whether the Services also intend to consider “societal conflicts” in evaluating whether *occupied* habitat is “essential to the conservation of the species” under 16 U.S.C. 1532(5)(A)(i). The Services should clarify that they *do not* intend to do so.

confine consultation to federal lands. *Id.* As discussed above, in Section II.A.iv., however, the Services' assumption is inconsistent with the mandate of the ESA, which does not require that effective consultation actions be available for an area of critical habitat to be designated, again unlawfully putting the consultation cart before the critical habitat designation horse. 16 U.S.C. §§ 1533(a)(3)(A), 1536. And it ignores the fact that there are a variety of reasons—like educating the public, planning species recovery, and identifying areas for consultation in the future—why an area should still be considered essential to the conservation of species and why designation of that critical habitat could further species' conservation, even if that land were not slated for a federal action that would prompt interagency consultation. For all the above reasons, the Services should withdraw the proposed Listing Rule.

**B. Interagency Cooperation Rule, 83 Fed. Reg. 35,178 (July 25, 2018)**  
Docket ID No. FWS-HQ-ES-2018-0009

The Services' proposed amendments to the Interagency Cooperation Regulations implementing section 7 of the ESA would make numerous significant, and in some cases sweeping, changes to the definitions and requirements of those regulations. In summary, these proposed changes are designed to: (a) limit the circumstances under which a federal agency action would be deemed to destroy or adversely modify critical habitat; (b) limit analysis of the type and extent of effects of a federal agency action; (c) create significant new exemptions from the consultation requirement; (d) limit re-initiation of consultation on federal land and resource management plans; (e) allow federal action agencies to conduct biological analyses that should be conducted by the Services; (f) allow federal action agencies to adopt mitigation measures as part of the project description without committing to implementation of these measures; and (g) allow for broad-based "programmatic" and "expedited" consultations that give short shrift to site-specific and in-depth analysis of a proposed federal agency action. Collectively, these proposed changes would severely limit: the circumstances requiring consultation; the scope of consultations, including the effects analyzed and the reasonable and prudent alternatives considered and mitigation measures required; and the number of "jeopardy" and "adverse modification" findings. As such, these proposed rules fail to "insure" that federal actions will not jeopardize listed species or destroy or adversely modify critical habitat, or that reasonable and prudent alternatives and mitigation measures will be required for such actions, as required by section 7.

The proposed revisions are contrary to the plain language and purpose of section 7, the conservation purpose of and precautionary approach undergirding the ESA, and the controlling case law. The Services therefore lack the authority to adopt these changes. In addition, the Services have failed to articulate a reasoned basis for the proposed changes, many of which—contrary to the Services' repeated assertions—constitute major, unexplained departures from the Services' decades-long practice. The proposals thus are also arbitrary and capricious.

**i. Revised Definitions.**

**"Destruction or Adverse Modification" of Critical Habitat.** The proposed revisions would alter the definition of "destruction or adverse modification" in 50 C.F.R. § 402.02, one of the triggers for consultation under ESA section 7(a)(2), to require the destruction or adverse modification of the critical habitat "*as a whole.*" 83 Fed. Reg. at 35,179-80, 35,191. The

proposal also would eliminate the definition's existing provision that "[s]uch alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features." *Id.* Although the Services initially claim that these changes would simply clarify the definition, they later disclose their intent to require that the "final destruction or adverse modification determination [be] made *at the scale of the entire critical habitat designation*," not any "less extensive scale." *Id.* at 35,180-81. These changes would severely limit the circumstances under which agency action would be deemed to destroy or adversely modify critical habitat, and allow for piecemeal, cumulative adverse effects on such habitat, including effects on features essential to the species' conservation, contrary to section 7, the definition of critical habitat, and the conservation purpose of the ESA.

Section 7(a)(2) requires agencies to "insure" that their actions are "not likely to . . . result in the destruction or adverse modification of" critical habitat, nowhere specifying that such destruction or adverse modification must occur at the scale of the entire designated habitat. 16 U.S.C. § 1536(a)(2). In addition, the ESA defines "critical habitat" as both occupied and non-occupied areas that are "essential" to or for "the conservation of the species." *Id.* § 1532(5)(A). "Conservation" is essentially synonymous with full "recovery" of the species.<sup>43</sup> Thus, critical habitat is "adversely modified" by any actions impairing species' recovery, and species' full recovery must be considered when federal agencies evaluate the effect of their actions on critical habitat. *See Lubchenco*, 723 F.3d at 1054; *Native Ecosys.*, 509 F.3d at 1322.

By evaluating impacts only on a species' *entire* designated critical habitat, the proposal ignores the fact that impacts to a portion of a species' designated critical habitat, particularly for species that are highly endangered, may jeopardize a species' chances of recovery, or even its very survival. This proposed change also would allow agencies to ignore or minimize the importance of the adverse cumulative effects of individual federal actions on critical habitat at a site-specific level, or those that occur on a short-term basis.<sup>44</sup> The proposed changes ignore the reality that critical habitat is not destroyed or modified all at once or as a whole; habitat is lost site-by-site, and such smaller-scale destruction or modification accordingly must be addressed at the site-specific level. The proposal thus is contrary to the ESA's plain language and recovery purpose.

The Services also fail to explain or justify this proposed rule change.<sup>45</sup> In particular, they fail to explain the deletion of the existing language stating that destruction or adverse modification occurs when an action alters "the physical or biological features essential to the

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<sup>43</sup> See 16 U.S.C. §§ 1531(b), 1532(3); *see also, e.g., Alaska v. Lubchenco*, 723 F.3d 1043, 1054 (9th Cir. 2013); *Center for Native Ecosys. v. Cable*, 509 F.3d 1310, 1322 (10th Cir. 2007).

<sup>44</sup> See *Miccosukee Tribe of Indians of Fla. v. United States*, 566 F.3d 1257, 1270-71 (11th Cir. 2009); *National Wildlife Fed'n v. National Marine Fisheries Serv.*, 524 F.3d 917, 930, 934-35 (9th Cir. 2008); *Pacific Coast Fed'n of Fishermen's Ass'n v. U.S. Bureau of Reclamation*, 426 F.3d 1082, 1093 ("Pacific Coast IP") (9th Cir. 2005); *Pacific Coast Fed'n of Fishermen's Ass'n v. National Marine Fisheries Serv.*, 265 F.3d 1028, 1036-37 (9th Cir. 2001) ("Pacific Coast P").

<sup>45</sup> *Fox*, 556 U.S. at 515 (agency must provide "good reasons" for policy change); *National Cable & Telecomms. Ass'n*, 545 U.S. at 981 ("unexplained inconsistency" is basis for invalidation of regulation or policy).

conservation of a species or that preclude or significantly delay development of such features.” 50 C.F.R. § 402.02; *see* 83 Fed. Reg. at 35,179-80, 35,191. In 2016, the Services determined that addition of this text was necessary to ensure that federal agency actions do not destroy or adversely modify critical habitat essential for a species’ recovery. 81 Fed. Reg. 7,214, 7,216-17 (Feb. 11, 2016); *see also id.* at 7,219-20. In an about-face, the Services now state that this language is being deleted because it purportedly has caused controversy and confusion and is unnecessary, but the Services do not explain why or how. 83 Fed. Reg. at 35,181. Nor do the Services explain how the new “streamline[d] and simplif[ied]” text will remedy that confusion or provide adequate guidance for when an action will destroy or adversely modify critical habitat. *Id.* Rather, the Services implausibly assure the public that they will continue to determine how alterations to critical habitat could affect species recovery. *Id.* But this assurance is refuted by the proposals’ changes to the definition of adverse modification, and the Service’s other, contradictory statements that the revisions will reduce the circumstances under which a federal action will be deemed to adversely modify critical habitat. *Id.*

**“Effects of the Action.”** The Services also propose significantly to alter the existing definition of “effects of the action” in 50 C.F.R. § 402.02, limiting both the type and extent of effects of a proposed federal agency action that must be considered during the consultation process. The proposal would restrict evaluation of an action’s effects during the consultation process, requiring that the proposed action be considered a “but for” cause of the effects or activities *and* that the effects or activities be “reasonably certain to occur” to be considered in evaluating the potential impacts of a federal agency action. 83 Fed. Reg. at 35,183, 35,191. Under the proposal, to be considered “reasonably certain to occur,” an activity must not be speculative, based on: (a) consideration of “past relevant experiences,” (b) “[a]ny existing relevant plans,” and (c) “[a]ny remaining economic, administrative, and legal requirements necessary for the activity to go forward.” *Id.* at 35,193. The proposed rules apply this concept of “reasonable certainty” to *all* effects of the proposed action, including direct and interrelated or interdependent effects, whereas previously the “reasonable certainty” standard applied only to indirect and cumulative effects of the proposed action. *Id.* at 35,183-84, 35,189.

These changes are inconsistent with the ESA and applicable case law. Section 7(a)(2) is “[t]he heart of the ESA,” *Western Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 495 (9th Cir. 2011), requiring federal agencies to “insure” that their actions are not likely to jeopardize listed species or result in the destruction or adverse modification of their habitat, 16 U.S.C. § 1536(a)(2). Section 7(b) requires action agencies to consult with the Services if any part of a proposed action “may affect any listed species or critical habitat.” *Western Watersheds Project*, 632 F.3d at 495. The “may affect” trigger for consultation is a “relatively low threshold[,]” allowing an agency to “avoid the consultation requirement only if it determines that its action will have ‘no effect’ on a listed species or critical habitat.” *Karuk Tribe of Cal. v. U.S. Forest Serv.*, 681 F.3d 1006, 1027 (9th Cir. 2012). For agency actions that “may affect” listed species or critical habitat, the Services must evaluate, in a comprehensive biological opinion, the effects of *all* aspects of that action, including short-term and long-term effects, and site-specific and cumulative effects, when combined with the adverse effects on the species and habitat that are already included as part of the environmental baseline.<sup>46</sup> The scope of that evaluation in a

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<sup>46</sup> *See, e.g., Turtle Island Restoration Network v. U.S. Dep’t of Commerce*, 878 F.3d 725, 737-38 (9th Cir. 2017); *Wild Fish Conservancy v. Salazar*, 628 F.3d 513, 521-24 (9th Cir. 2010); *Miccousukee Tribe*, 566

biological opinion directly affects the determination of whether the action is likely to cause jeopardy or adverse modification of critical habitat, and whether “reasonable and prudent alternatives” to the action will be required, as well as the type and extent of “reasonable and prudent measures” that will be required to mitigate the adverse effects of the action. 16 U.S.C. § 1536(b)(3)(A), (b)(4); see *Wild Fish Conservancy*, 628 F.3d at 522 (“The delineation of the scope of an action can have a determinative effect on the ability of a biological opinion fully to describe the impact of the action on the viability of the threatened species . . .”).

Contrary to these statutory requirements, the proposed changes to the definition of “effects of the action” would arbitrarily limit the scope of the section 7 analysis to effects for which the federal agency action was a “but for” cause and those that are deemed “reasonably certain to occur” based on a variety of non-biological factors. For example, the numerous non-biological “reasonable certainty” factors and limitations in new section 402.17 would allow arbitrary exclusion of certain effects—that are admittedly caused by the proposed action—from the section 7 effects analysis, based on almost any conceivable rationale. See 83 Fed. Reg. at 35,189. In addition, these changes would allow federal action agencies and the Services to narrowly define the scope of the proposed action and its effects and to conduct a piecemeal, limited evaluation of the action’s adverse effects on listed species and critical habitat, thus ignoring many of the action’s true impacts, contrary to the ESA and governing case law.

These “reasonable certainty” factors also would give the Services leeway to ignore agency actions’ contributions to climate change and resulting effects. As discussed *supra* in Section II.A.ii., it is certain that climate change will increasingly affect species conservation even though the precise extent of the impact may at times be difficult to predict with certainty. Thus, the proposed regulations, like the biological opinion invalidated in *National Wildlife Federation*, amount “to little more than an analytical slight [sic] of hand” that will enable federal action agencies and the Services to “manipulat[e] the variables to achieve a ‘no jeopardy’ finding.” 524 F.3d at 933. Indeed, the proposal not only would enable such manipulation, but also would officially sanction it and render it common practice, contrary to the statutory commands of section 7. Moreover, the proposed “reasonable certainty” factors run counter to the ESA’s requirement that the Services must use the “best available science” in conducting consultations. 16 U.S.C. § 1536(a)(2). The Services must make decisions based on the best scientific information available at the time the decision is made rather than defer analysis or decisions simply because either the information or outcome is not “reasonably certain.” See *Conner*, 848 F.2d at 1453-54.

In addition, the Services have failed to adequately explain or justify these proposed changes. Once again, the Services provide only the empty excuse that these changes are intended to simplify the definition, “increase consistency and avoid confusion and speculation,” and codify the existing practice in conducting section 7 consultations. 83 Fed. Reg. at 35,183. But the Services do not identify any inconsistency or confusion that needs to be resolved or explain how the proposed changes would resolve those problems. In fact, the proposed changes

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F.3d at 1270; *National Wildlife Fed’n*, 524 F.3d at 928-30, 934-35; *Pacific Coast II*, 426 F.3d at 1090-95; *Pacific Coast I*, 265 F.3d at 1036-38; *Conner v. Burford*, 848 F.2d 1441, 1453, 1457 (9th Cir. 1988).

are likely to lead to increased confusion, inconsistency, and uncertainty as to what effects can and cannot be considered during consultation.

Furthermore, the assertion that the “reasonable certainty” standard already was part of its existing practice in conducting section 7 consultations is plainly incorrect. *See* 83 Fed. Reg. 35,183-84 (citing 80 Fed. Reg. 26,832, 26,837 (May 15, 2015)). The cited discussion from the 2015 rule change does not pertain to the scope of analysis of the effects of a proposed federal action in a biological opinion. Rather, the discussion applies only to the determination whether *incidental take* is “reasonably certain to occur” and must be accounted for in an incidental-take statement accompanying the biological opinion under section 7(b)(4). *See* 80 Fed. Reg. at 26,836-37. In sum, rather than resolving uncertainty or codifying current practice, the proposed changes would severely limit the effects of federal action considered in the section 7 consultation process, contrary to the plain language and purposes of section 7 and the ESA as a whole.

**“Environmental Baseline.”** The Services next propose to separate out the concept of the “environmental baseline” currently embedded in the definition of “effects of the action” into a separate definition in 50 C.F.R. § 402.02. While the Services are not now proposing any specific change to the “environmental baseline” concept, they request comment on possibly revising the definition of “environmental baseline” to mean “the state of the world absent the action under review,” including “the past, present[,] and ongoing impacts of *all past and ongoing Federal, State, or private actions and other human activities* in the action area . . . .” . 83 Fed. Reg. at 35,184 (emphasis added). As discussed below, this suggested change raises the concern that the Services or federal action agencies will subsume ongoing actions or conditions into the baseline, thereby failing to account for the full extent of impacts of those actions and artificially inflating the baseline, thus inappropriately minimizing an action’s adverse impacts on listed species and critical habitat, once again contrary to section 7.

The courts have made clear that section 7 of the ESA applies to federal agency actions over which an agency has discretionary involvement or control. *National Assn. of Homebuilders v. Defenders of Wildlife*, 551 U.S. 644, 667-68 (2007). The courts have expressly held that “agency action” must be construed broadly and includes ongoing federal agency actions or actions over which the agency otherwise has discretionary involvement or control.<sup>47</sup> Indeed, the U.S. Supreme Court has held that “it is clear Congress foresaw that § 7 would, on occasion, require agencies to alter *ongoing projects* in order to fulfill the goals of the Act.” *Hill*, 437 U.S. at 186 (emphasis added).

Courts also have expressly held that where there is a federal agency action that meets the section 7 consultation trigger, the Services cannot minimize the effects of that action by subsuming an ongoing federal agency action within the environmental baseline. For example, in *National Wildlife Federation*, NMFS incorporated ongoing impacts of dam operation into the environmental baseline in a biological opinion on the ground that ongoing operations were “non-

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<sup>47</sup> *See, e.g., Cottonwood Envtl. Law Ctr. v. U.S. Forest Serv.*, 789 F.3d 1075, 1086-88 (9th Cir. 2015); *Karuk Tribe*, 681 F.3d at 1020; *Wild Fish Conservancy*, 628 F.3d at 521-22, 524; *Turtle Island Restoration Network v. National Marine Fisheries Serv.*, 340 F.3d 969, 977 (9th Cir. 2003); *Natural Res. Def. Council v. Houston*, 146 F.3d 1118, 1126 (9th Cir. 1998); *Pacific Rivers Council v. Thomas*, 30 F.3d 1050, 1054 (9th Cir. 1994); *Conner*, 848 F.2d at 1453.

discretionary.” 524 F.3d at 928-33. The court invalidated the biological opinion, holding that the ESA does not permit agencies to “ignore potential jeopardy risks by labeling parts of an action non-discretionary.” *Id.* at 928. Accordingly, NMFS may not sweep “so-called ‘nondiscretionary’ operations into the environmental baseline, thereby excluding them from the requisite ESA jeopardy analysis.” *Id.* at 929; *accord San Luis & Delta Mendota Water Auth.*, 747 F.3d at 639-40. The D.C. Circuit recently followed suit, holding that the FWS “acted arbitrarily in establishing the environmental baseline without considering the degradation to the environment caused by” the ongoing operation of a hydropower project. *American Rivers v. FERC*, 895 F.3d 32, 46-47 (D.C. Cir. 2018).<sup>48</sup>

Against this weight of authority, the Services attempt to cite as support for their potential change “complexities” that they claim have arisen in consultations on ongoing agency actions, such as: “if an ongoing action is changed, is the incremental change in the ongoing action the only focus of the consultation or is the entire action or some other subset reviewed,” and “is the effects analysis different if the ongoing action has never been the subject of consultation as compared to if there is a current biological opinion for the ongoing action,” among other questions. 83 Fed. Reg. at 35,184. As discussed above, however, these questions have already been answered by controlling case law: the “effects of the action” include *all* effects of an ongoing federal agency action over which the agency has discretionary involvement or control—regardless of whether consultation was previously conducted on the action—added to the effects on the species and habitat already occurring as part of the environmental baseline but which are not in any way caused by the federal agency action, including its ongoing effects. In sum, the Services’ proposed incorporation of ongoing federal agency actions into the “environmental baseline” runs afoul of established law.

## **ii. Exemptions from the Consultation Requirement.**

Although not included in the proposed rules, the Services seek comment on revising 50 C.F.R. § 402.03 to eliminate the consultation requirement when the Federal agency does not anticipate take, and the action either: (1) will not affect listed species or critical habitat; (2) will have effects that are “manifested through global processes” and cannot be reliably predicted or measured, or would have “an extremely small and insignificant” or “remote” impact on species or critical habitat; or (3) will have impacts that “are either wholly beneficial or are not capable of being measured or detected in a manner that permits meaningful evaluation.” 83 Fed. Reg. at 35,185. The Services again state that the purpose of this new suite of “no-consultation” criteria is “to increase efficiency in implementing section 7(a)(2) consultations,” claiming that “such actions are far removed from any potential for jeopardy or destruction or adverse modification of critical habitat . . . .” *Id.* The Services also seek comment on whether the scope of consultation under section 7(a)(2) should be limited *solely* to the “activities, areas, and effects within the jurisdictional control and responsibility of the regulatory agency.” *Id.*

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<sup>48</sup> See also *Turtle Island Restoration Network*, 878 F.3d at 737-38 (“[B]aseline conditions must be factored into the jeopardy analysis, cumulatively with the entirety of agency actions. The relevant inquiry is therefore whether the ‘action effects, when added to the underlying baseline conditions,’ are such that they would cause jeopardy.”); *Wild Fish Conservancy*, 628 F.3d at 522-29 (FWS required to analyze the effects of ongoing operation of a fish hatchery on the endangered bull trout, and had not adequately justified analyzing the ongoing action for only a five-year period).

The foregoing proposals are patently inconsistent with the ESA for multiple reasons. First, they would significantly limit the circumstances under which a federal agency would be required to consult with the Services on a proposed federal action, contrary to the plain language and intent of section 7. As already discussed, the “may affect” standard in section 7(b) establishes a “low threshold” for the consultation requirement and requires the Services to examine and account for all aspects of the federal agency action, including beneficial effects and effects that cannot be predicted with certainty. *Karuk Tribe*, 681 F.3d at 1027 (citing *California, ex rel. Lockyer v. U.S. Dep’t of Agric.*, 575 F.3d 999, 1018 (9th Cir. 2009)).<sup>49</sup> Accordingly, “[a]n agency may avoid the consultation requirement only if it determines that its action will have ‘no effect’ on a listed species or critical habitat.” *Karuk Tribe*, 681 F.3d at 1027 (emphasis added).

The Services have no authority to create by regulation new exemptions from federal agencies’ mandatory duties under section 7. *Hill*, 437 U.S. at 173, 188 (section 7 “admits of no exception”); *Conner*, 848 F.2d at 1455 (“Appellants ask us, in essence, to carve out a judicial exception to ESA’s clear mandate that a comprehensive biological opinion . . . be completed before initiation of the agency action . . . . We reject this invitation to amend the ESA. That is the role of Congress, not the courts.”). What is more, in proposing to exempt from consultation proposed actions that will have effects “manifested through global processes,” the Services again arbitrarily attempt to create a “climate change” exception to yet another bedrock program of the ESA, in this case when federal agencies are *contributing* to the problem. But, as already discussed, *see supra* Section II.A.ii., iv., and v., where climate change is a threat, it is even *more* important that the ESA’s species protections be fully implemented and enforced to ensure species recovery and conservation.

Second, the Services cannot adequately justify or explain this proposed reversal of their longstanding interpretation of section 7. In promulgating the current version of the section 7 regulations in 1986, the Services explained that “[a]ny possible effect, whether beneficial, benign, adverse[,] or of an undetermined character,” triggers the section 7 consultation requirement. 51 Fed. Reg. 19,926, 19,949 (June 3, 1986). The Services then stated that this “threshold for formal consultation *must be set sufficiently low* to allow Federal agencies to satisfy their duty to ‘insure’” that their actions do not jeopardize listed species or adversely modify critical habitat as required under section 7. *Id.* (emphasis added). The Services’ fail to explain how their new proposal could possibly achieve that fundamental objective.

Third, the Services do not have authority to limit consultations solely to effects within the jurisdiction and authority of the federal action agency. *See Native Ecosys. Council v. Dombeck*, 304 F.3d 886, 902 (9th Cir. 2002) (agency must consider all areas that actually would be affected by proposed action and may not arbitrarily restrict its selection of “action area” to be considered). Rather, as discussed, section 7 requires federal agencies to initiate consultation on any federal agency action over which they have discretionary involvement or control, and to broadly examine *all* effects of that action. *National Ass’n of Homebuilders*, 551 U.S. at 668-69;

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<sup>49</sup> *See also Conner*, 848 F.2d at 1453-55 (having “incomplete information about post-leasing activities does not excuse the failure to comply with the statutory requirement of a comprehensive biological opinion using the best information available.”); *accord Wild Fish Conservancy*, 628 F.3d at 525.



*Conner*, 848 F.2d at 1453-54, 1457-58. The Services’ proposal thus would put federal agencies in the untenable position of either violating their section 7 obligations or demanding that the Services engage in consultation beyond that contemplated by their *ultra vires* regulations.

Finally, as discussed in connection with the proposed changes to 50 C.F.R. § 402.14(h) below, section 7 requires the Services to make independent biological determinations, based on their scientific and technical expertise, regarding the effects of proposed federal agency actions. *See Cal. ex rel. Lockyer.*, 575 F.3d at 1018. However, the proposed revisions to 50 C.F.R. § 402.03 do not contain any requirement for federal agencies to obtain the Service’s written concurrence in federal agency determinations of “no effect,” “beneficial effect,” “insignificant effect,” or “immeasurable effect.” In sum, because the Services’ new “no consultation” criteria thus constitute an unlawful, arbitrary, and wholly unexplained reversal of their longstanding policy that is contrary to the ESA, they must be withdrawn. *Fox*, 556 U.S. at 515.

### **iii. Weakening of Mitigation Requirements.**

The Services propose to add language to the end of the formal consultation provisions in 50 C.F.R. § 402.14(g)(8) stating that “[m]easures included in the proposed action or a reasonable and prudent alternative that are intended to avoid, minimize, or offset the effects of an action are considered like other portions of the action and do not require any additional demonstration of specific binding plans or a clear, definite commitment of resources.” 83 Fed. Reg. at 35,187, 35,192. The Services admit that these proposed changes are designed to repudiate the Ninth Circuit’s decision in *National Wildlife Federation*, 524 F.3d 917, asserting that “[t]his judicially created standard is not required by the Act or the existing regulations.” 83 Fed. Reg. at 35,187. The Services claim that, rather, they must simply “assume that the [proposed federal] action will be implemented as proposed,” and that they are not required “to independently evaluate whether the proposed measures to avoid, minimize, or offset adverse effects will be implemented.” *Id.*

This proposed revision would contradict established case law, which clearly requires that federal agency mitigation commitments be incorporated into the proposed action *and* be binding and enforceable.<sup>50</sup> This requirement is necessary to ensure that the federal action agency satisfies its duties under section 7(a)(2) of the ESA. If the federal action agency does not ensure that proposed mitigation measures included within the project description will be implemented, then the Services’ jeopardy and adverse modification findings and accompanying “reasonable and prudent alternatives” will be based on a project description that may or may not be accurate, making section 7 essentially aspirational. Whether mitigation measures will in fact be implemented also will affect the level of likely incidental take for purposes of the section 7 incidental take statement and its accompanying “reasonable and prudent measures.” 16 U.S.C. § 1536(b)(4). Finally, enforceability of mitigation is important to establish measurable triggers for re-initiation of consultation and to ensure federal agency compliance with the terms and conditions of incidental take statements and other provisions of biological opinions. *See Center for Biological Diversity v. Bureau of Land Mgmt.*, 698 F.3d 1101, 1115-16 (9th Cir. 2012).

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<sup>50</sup> *See Center for Biological Diversity v. Bureau of Land Mgmt.*, 698 F.3d 1101, 1117 (9th Cir. 2012); *Rock Creek All. v. FWS*, 663 F.3d 439, 444 (9th Cir. 2011); *National Wildlife Fed’n*, 524 F.3d at 935-36; *Selkirk Conservation All. v. Forsgren*, 336 F.3d 944, 955-56 (9th Cir. 2003).

**iv. Diminishing the Service’s Role in Consultation.**

The Services also propose to create a new consultation procedure in 50 C.F.R. § 402.14(h) that would allow the Services to adopt, as their own biological opinions, all or part of a federal action agency’s biological analyses that are submitted upon its initiation of formal consultation. 83 Fed. Reg. at 35,187-88, 35,192. The Services state that the purpose of this alternative process “is to bring the information and expertise of both the Federal agency and the Service (and any applicant) into the resulting initiation package to facilitate a more efficient and effective consultation process.” *Id.* at 35,188. These provisions are inappropriate and unlawful because only the Services, and not the federal action agency, have the requisite biological expertise, and the Services are statutorily required to perform the biological analysis of the effects of the action. 16 U.S.C. § 1536(b)(3)(A). As the courts have repeatedly stated, “[t]he purpose of the consultation procedure is to allow *either [NMFS] or the FWS to determine* whether the federal action is likely to jeopardize the survival of a protected species or result in the destruction of its critical habitat, and if so, to identify reasonable and prudent alternatives that will avoid the action’s unfavorable impacts.” *Turtle Island Restoration Network*, 340 F.3d at 974 (emphasis added).<sup>51</sup> Contrary to that purpose, the proposed revisions would enable the Services merely to “rubber stamp” an action agency’s analysis as its own, without applying their expertise and performing the required independent, science-based analysis.<sup>52</sup>

**v. Expansion of Programmatic Consultation and Addition of a New “Expedited Consultation” Procedure.**

**“Programmatic Consultations.”** The proposal also would add a new definition of “programmatic consultation” to 50 C.F.R. § 402.02 to provide for “a consultation addressing an agency’s multiple actions on a program, region or other basis,” including but not limited to: (1) “[m]ultiple, similar frequently occurring or routine actions expected to be implemented in particular geographic areas,” and (2) “[a] proposed program, plan, policy, or regulation providing a framework for future actions.” 83 Fed. Reg. at 35,191-92; *see also id.* at 35,184-85

Although programmatic consultation may be appropriate in some cases, the proposed changes would authorize such consultations in circumstances where it is not appropriate. For example, when used for multiple different projects occurring in the same region, the site-specific impacts of individual proposed federal agency actions on listed species and critical habitat would not be separately addressed or adequately considered. But section 7 requires that consultations on large-scale and programmatic actions may not ignore or minimize the site-specific and short-term effects of these actions, *see, e.g., Pacific Coast II*, 426 F.3d at 1091-95; *Pacific Coast I*, 265

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<sup>51</sup> *See also Center for Biological Diversity v. Environmental Prot. Agency*, 847 F.3d 1075, 1084 (9th Cir. 2017) (“Consultation allows agencies to draw on the expertise of wildlife agencies.”); *Karuk Tribe*, 681 F.3d at 1020 (“[T]he purpose of consultation is to obtain the expert opinion of wildlife agencies . . .”).

<sup>52</sup> The proposal to allow the Services to adopt *their own* existing analysis in a permit issued pursuant to ESA section 10(a) could satisfy the Services’ obligation under section 7, but only to the extent these prior analyses are relevant to the scope of section 7 consultation. For example, where the analysis in a 10(a) permit does not address the effect on a listed species, critical habitat, or listed plants that may be present in a permit area, it must be supplemented during consultation to fully assess those impacts as required by section 7.

F.3d at 1035-38, and programmatic biological opinions are permissible only when the analysis is “supplemented by later project-specific environmental analysis,” *Gifford Pinchot Task Force*, 378 F.3d at 1068.

The Services also inappropriately state that programmatic consultation can be used in an informal consultation. It is difficult to conceive how a programmatic consultation analyzing the effects of multiple projects over a large area or a single large project occurring on a broad geographic scale could ever possibly meet the “not likely to adversely affect” requirement for informal consultation. *See* 50 C.F.R. § 402.13(a). As with other proposals, this proposed change ignores the significant direct, indirect, and cumulative effects of federal agency actions and the Services’ and federal agencies’ statutory duties to comprehensively analyze those effects.<sup>53</sup>

**“Expedited Consultations.”** The proposed revisions further would add a new 50 C.F.R. § 402.14(*I*) authorizing “expedited consultations” as an “optional formal consultation process that a Federal agency and the Service may enter into upon mutual agreement.” 83 Fed. Reg. at 35,192-93; *see also id.* at 35,188. According to the Services, the determination whether expedited consultation is appropriate will be based on “the nature, size[,] and scope of the action or its anticipated effects on listed species or critical habitat and other relevant factors.” *Id.* at 35,193.

This expedited consultation procedure has many of the same flaws as excessive reliance on programmatic consultation. The proposed language affords the Services unduly broad discretion and does not ensure that expedited consultations will sufficiently and comprehensively evaluate the effects of federal actions, contrary to the requirements of section 7. The proposal also is vague and open-ended in identifying what actions may be subject to expedited consultation and offers no criteria or process to guide expedited consultation. The Services instead broadly state that “[t]his consultation process is proposed to provide an efficient means to complete formal consultation on projects ranging from those that have a minimal impact, to those projects with a potentially *broad range of effects* that are known and predictable, but that are unlikely to cause jeopardy or destruction or adverse modification.” 83 Fed. Reg. at 35,188 (emphasis added). The Services provide no justification for their assumption that such projects are “unlikely to cause jeopardy or adverse modification” and also provide only one example of an action that might be subject to expedited consultation—conservation actions designed primarily to benefit the species—ignoring the fact that federal restoration and recovery actions already are subject to a streamlined consultation process.<sup>54</sup>

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<sup>53</sup> The problems with this proposal are compounded by the Services’ statement that federal agencies and applicants can “propose measures to avoid, minimize, and/or offset effects to listed species and/or designated critical habitat as part of their proposed action” on a broad, programmatic scale. 83 Fed. Reg. at 35,184-85. But as discussed above, under the proposed amendments to 50 C.F.R. § 402.14(g)(8), these proposals would not need to be enforceable, thereby exponentially increasing the risks to listed species and critical habitat if such measures are not implemented and cannot be enforced on a programmatic level.

<sup>54</sup> *See* FWS, STREAMLINED CONSULTATION GUIDANCE FOR RESTORATION/RECOVERY PROJECTS (Nov. 16, 2016), available at <https://www.fws.gov/endangered/esa-library/pdf/Final%20RRP%20Guidance%20w%20memo%2011012016.pdf>.

Importantly, the Services admit that “expedited consultations are a new process and likely [will] involve proposed actions *that would otherwise go through the regular formal consultation process and require an incidental take statement.*” 83 Fed. Reg. at 35,188 (emphasis added). In other words, expedited consultations would, under the Services’ new proposal, be available for actions that are “likely to adversely affect” listed species or designated critical habitat *and* reasonably likely to result in incidental take. *See* 50 C.F.R. §§ 402.13(a), 402.14(a); 80 Fed. Reg. 26,832 (May 11, 2015). Thus, the Services’ statement that actions subject to the new expedited consultation procedure will be “unlikely to cause jeopardy or destruction or adverse modification” is plainly insupportable and contradicted by their own statements. 83 Fed. Reg. at 35,188. Moreover, the Services’ statements, and the vague criteria for when expedited consultation is appropriate, raise the suspicion that expedited consultation will become the norm rather than the exception, undermining the rigor and completeness of the normal consultation process.

In sum, the expedited consultation procedure allows for an end-run around some of the most important and fundamental requirements of the ESA: to comprehensively analyze and mitigate the effects of federal agency actions on listed species and their critical habitat. And whether a particular action is subject to the expedited consultation procedure will be based solely on an arbitrary determination by the Services and the federal action agency following no ascertainable criteria, without any public review and oversight. The unlawful and arbitrary proposal should be abandoned.

**vi. Exemption from the Requirement to Reinitiate Consultation on Federal Land and Resource Management Plans.**

The Services propose to add new 50 C.F.R. § 402.16(b), eliminating the requirement to reinitiate consultation on an approved Bureau of Land Management (“BLM”) or U.S. Forest Service (“Forest Service”) land and resource management plan (“management plan”) upon the listing of a new species or designation of new critical habitat in the plan area, “provided that any authorized actions that may affect the newly listed species or designated critical habitat will be addressed through a separate action-specific consultation.” 83 Fed. Reg. at 35,193; *see also id.* at 35,188-89. The Services claim that “[r]equiring reinitiation on these completed plans based on newly listed species or critical habitat often results in impractical and disruptive burdens,” and “results in little benefit to the newly listed species or critical habitat . . .” *Id.* at 35,189.

This proposed change would drive a large hole in existing reinitiation requirements, directly contrary to the case law rejecting this very concept. In *Pacific Rivers Council*, 30 F.3d at 1053, the Ninth Circuit expressly held that management plans “have an ongoing and long-lasting effect even after adoption . . . and represent ongoing agency action.” The Court expressly rejected the Forest Service’s argument, identical to the Services’ contention in support of the proposed rule change here, that it was not required to reinitiate consultation on a management plan when a new species was listed in the plan area. *Id.* at 1055. Similarly, the Forest Service was required to reinitiate consultation on a management plan where the FWS subsequently had revised a previous critical habitat designation to include National Forest land. *Cottonwood Env’tl. Law Ctr.*, 789 F.3d at 1086-88 (“[R]equiring reinitiation in these circumstances comports with the ESA’s statutory command that agencies consult to ensure the ‘continued existence’ of

listed species.” (emphasis in original)). The court held that the “new [critical habitat] protections triggered new obligations” and the Forest Service could not “evade its obligations by relying on an analysis it completed before the protections were put in place.” *Id.* at 1088.

Moreover, as previously discussed, other cases likewise make clear that, in general, section 7 consultation is required for any action over which the federal agency retains discretionary involvement or control to protect listed species and habitat. *Turtle Island Restoration Network*, 340 F.3d at 974; *see National Wildlife Fed’n*, 524 F.3d at 926-29 (obligation to consider effects of ongoing operations of dam, where Congress specified broad goals, but agency retained significant discretion as to how to achieve those goals). The Services do not and cannot contend that the BLM and the Forest Service do not retain sufficient discretionary involvement, authority, or control over federal management plans to institute additional protections for species and habitat upon a new listing or critical habitat designation. Consequently, the Services’ explanation of the rationale for this proposed change is contrary to law.

The Services also claim that reinitiation of consultation on federal management plans “does little to further” the overall goals of the ESA, but fail to explain why or provide any detail. In addition, the Services erroneously allege—without any justification—that management plans have “no immediate on-the-ground effects” and that consultation need only be conducted on individual federal agency actions proceeding under these plans. 83 Fed. Reg. at 35,189. This assertion is directly contrary to case law and common sense and ignores the widespread and cumulative effects of these broad-based federal agency actions. Management plans contain substantive criteria governing the nature and extent of permissible land uses and impacts to species and habitat on a large scale, on a programmatic and ongoing basis. *See Pacific Rivers Council*, 30 F.3d at 1051-53, 1055 (management plans “have an ongoing and long-lasting effect even after adoption” and set forth criteria for timber harvesting, grazing, road building, and other activities on federal lands); *Forest Guardians v. Forsgren*, 478 F.3d 1149, 1158-59 (10th Cir. 2007) (approving of the statement in *Pacific Rivers Council* that management plans “may have ‘an ongoing and long-lasting effect’ on the forest”). Failing to revisit them when new imperiled species and their habitat are identified would render those plans outdated and risk species’ recovery or survival.

In sum, this proposal fails to meet the Services’ or federal action agencies’ section 7 obligations and is also arbitrary and capricious because the Services have failed to offer any reasonable justification for the exemption.

#### **C. 4(d) Rule, 83 Fed. Reg. 35,174 (July 25, 2018)**

Docket ID No FWS-HQ-ES-2018-0007

The 4(d) Rule proposes to remove, going forward, the “blanket” extension to threatened species of all protections afforded to endangered plants and animals under the ESA. *See* 16 U.S.C. § 1538(a)(1)-(2); 83 Fed. Reg. at 35,175, 35,177-78. The proposed rule abandons FWS’s longstanding policy and practice of providing default protections to all newly listed threatened species, subject only to exceptions carved out by special rule as necessary on a species-by-

species basis.<sup>55</sup> Instead, FWS intends to issue species-specific rules only as it deems necessary to protect threatened species, and specifically preserves its discretion to delay promulgation of those protections for an indefinite period, “at any time after the final listing or reclassification determination.” *Id.* at 35,175. The proposal is a dramatic departure from current FWS practice and contrary to the ESA’s conservation purpose and precautionary policy approach because it inevitably will leave threatened species without protections necessary to promote recovery and survival, instead increasing the threat that they will become endangered. FWS provide no sound reason for this abrupt policy change, which would strain already overburdened agency resources and lead to litigation challenges.

First, the proposal contravenes the ESA’s policy of “institutionalized caution” because it inevitably will result in FWS neglecting to provide adequate protections to threatened species. *Hill*, 437 U.S. at 178, 194. As the Supreme Court has emphasized, the ESA’s core purpose is “to halt and reverse the trend toward species extinction, whatever the cost.” *Id.* at 184. Given the agency’s history of listing backlogs,<sup>56</sup> and its increasingly limited budget,<sup>57</sup> FWS does not have the capacity or resources to promulgate species-specific 4(d) rules at the outset for individual threatened species at the level that would be necessary to match the protection that is currently in place with the blanket 4(d) rule.<sup>58</sup> Instead, it is highly likely that the FWS will rarely promulgate special rules extending the take prohibition or other protections to newly listed or reclassified threatened species. And even where species-specific rules are adopted, as FWS appears to anticipate, there will likely be a significant delay during which no protections would be in place. 83 Fed. Reg. at 35,175.

Without interim protections, newly listed or reclassified threatened species would face significant risk of harm, and parties that put threatened species in danger would be free from consequences and undeterred. Either circumstance thus would upend the precautionary approach enshrined in the ESA, which the FWS has implemented for decades by instituting default protections for threatened species to keep them from sliding toward endangerment and extinction

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<sup>55</sup> See 50 C.F.R. §§ 17.31, 17.71.

<sup>56</sup> See GAO Listing Deadline Litigation Report, *supra* note 27, at 5-18 (reporting that 141 lawsuits involving 1,441 species were filed from fiscal year 2005 through 2015 alleging that FWS and NMFS failed to take actions within deadlines mandated by ESA section 4, most of which involved missed deadlines to act on petitions to list species); Benjamin Jesup, *Endless War or End This War? The History of Deadline Litigation Under Section 4 of the Endangered Species Act and the Multi-District Litigation Settlements*, 14 VT. J. ENVTL. L. 327, 348-51 (2013).

<sup>57</sup> See *President Proposes \$1.2 Billion FY 2019 Budget for U.S. Fish and Wildlife Service*, FWS press release, Feb. 12, 2018, available at [https://www.fws.gov/news/ShowNews.cfm?ref=president-proposes-\\$1.2-billion-fy-2019-budget-for--u.s.-fish-and-w& ID=36224](https://www.fws.gov/news/ShowNews.cfm?ref=president-proposes-$1.2-billion-fy-2019-budget-for--u.s.-fish-and-w& ID=36224). Compare FY 2018 INTERIOR BUDGET IN BRIEF, BUREAU HIGHLIGHTS, FWS, available at [https://edit.doi.gov/sites/doi.gov/files/uploads/fy2018\\_bib\\_bh059.pdf](https://edit.doi.gov/sites/doi.gov/files/uploads/fy2018_bib_bh059.pdf), with FY 2019 INTERIOR BUDGET IN BRIEF, BUREAU HIGHLIGHTS, FWS, available at [https://edit.doi.gov/sites/doi.gov/files/uploads/fy2019\\_bib\\_bh059.pdf](https://edit.doi.gov/sites/doi.gov/files/uploads/fy2019_bib_bh059.pdf) (proposed fiscal year 2019 budget request of \$1.2 Billion for FWS was nearly twenty percent less than fiscal year 2017 operating budget of \$1.5 Billion).

<sup>58</sup> Indeed, as discussed *supra* in Section II.A.i., the Services’ proposed introduction of economic impact analysis into species listing decisions, if adopted and finalized, would further burden limited FWS resources.

while details of specially tailored rules are worked out. *See Hill*, 437 U.S. at 178, 194; *Sweet Home*, 515 U.S. at 698-99. Against this clear statutory purpose, FWS cannot fall back on its unsupported claim that the proposed change will provide “meaning to the statutory distinction between ‘endangered species’ and ‘threatened species.’” 83 Fed. Reg. at 35,175. Indeed, the D.C. Circuit already has rejected arguments that the blanket rule impermissibly blurs the statutory distinction between endangered and threatened species. *See Sweet Home Chapter of Cmty. for a Greater Oregon v. Babbitt*, 1 F.3d 1, 6-7 (D.C. Cir. 1993).

Second, the 4(d) Rule is arbitrary and capricious because FWS fails to analyze important aspects of the problem and provides no reasoned justification for its proposal. As an initial matter, the 4(d) Rule lacks any acknowledgement or discussion of FWS resource constraints or the increased workload and exacerbated delay that would be associated with conducting species-by-species assessments and promulgating special rules necessary to adequately protect all newly listed threatened animals or plants in the absence of the blanket take prohibition. The agency has thus “entirely failed to consider an important aspect of the problem”—one that will in all likelihood undermine the ESA’s mission and result in harm to imperiled species. *Motor Vehicle Mfrs.*, 463 U.S. at 43. And where FWS declines to promulgate or delays special rules to protect newly listed threatened species, the agency inevitably will face lawsuits challenging the inaction or delay, further burdening agency resources.

For the same reason, FWS cannot resort to its stated intent to align FWS practices with that of NMFS, which does not by default extend endangered species protections to threatened species but instead only promulgates species-specific rules for threatened species. 83 Fed. Reg. at 35,175. The agency fails to appreciate or even acknowledge that there are many reasons why FWS should employ a different rule than its sister agency. NMFS has jurisdiction over, and manages fewer than, one hundred marine species listed as threatened or endangered in the U.S.<sup>59</sup> By contrast, FWS manages more than 1,660 ESA-listed species in the U.S.<sup>60</sup> And yet the resources available to NMFS for promulgating and implementing special rules for each threatened species vastly exceed those of FWS. For example, for the fiscal year 2017, NMFS’s annual budget for managing 159 U.S. and foreign ESA-listed species was \$182 million, compared to FWS’s budget of \$234 million to manage more than 2,100 U.S. and foreign ESA-listed species.<sup>61</sup> While NMFS may have the capacity and resources to promulgate species-specific rules at the outset, FWS indisputably does not.

Nor does FWS provide any reasoned explanation or justification for abandoning the section 4(d) blanket protections with special rules carving out exceptions, a policy FWS itself

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<sup>59</sup> *See Endangered Species Conservation*, NOAA FISHERIES

<https://www.fisheries.noaa.gov/topic/endangered-species-conservation> (NMFS has jurisdiction over a total of 163 ESA-listed species, 66 of which are foreign species) (last visited Sept. 23, 2018).

<sup>60</sup> *Environmental Conservation Online System, Listed Species Summary*, FWS,

<https://ecos.fws.gov/ecp0/reports/box-score-report> (FWS has jurisdiction over a total of 2,344 ESA-listed species, 683 of which are foreign species) (last visited Sept. 23, 2018).

<sup>61</sup> *See, e.g., Jason Huffman, U.S. Lawmaker Rekindles Talk of Moving NOAA Endangered Species Power to Interior*, UNDERCURRENT NEWS: SEAFOOD BUSINESS NEWS (Apr. 13, 2018), available at <https://www.undercurrentnews.com/2018/04/13/us-lawmaker-rekindles-talk-of-moving-noaa-endangered-species-power-to-interior/>.



acknowledges not only is reasonable, but has also been effective and successful. *See* 83 Fed. Reg. at 35,175. Indeed, the 4(d) Rule notes FWS’s years of experience developing species-specific special rules under its current policy and the many benefits provided by this flexible yet protective approach. *Id.*<sup>62</sup> The agency perversely attempts to invoke the benefits of species-specific rules to justify its wholesale elimination of the blanket take prohibition. *Id.* But those benefits simply have no bearing on the wisdom of abolishing protections for all newly listed species while those species-specific rules are being developed, nor do they provide a “good reason” for upending forty years of agency policy and practice. *Fox*, 556 U.S. at 515. The agency fails to explain how its proposal comports the ESA’s mandates and purpose and adequately protects threatened species before species-specific rules are developed. *Id.*

For all the above reasons, FWS should withdraw the proposed 4(d) Rule. Should the agency proceed with this illegal and ill-advised revision, however, any final rule must include a mandatory deadline, no later than 180 days following any final listing or reclassification for FWS to promulgate all necessary protections in a species-specific special rule. Without a mandatory timeframe, FWS would have unfettered discretion to promulgate species-specific rules “at any time after the final listing or reclassification determination,” 83 Fed. Reg. at 35,175, again departing from the ESA’s purpose and clear directive that FWS use its resources and authority to conserve threatened species, *see* 16 U.S.C. §§ 1531(b), (c), 1533(d).<sup>63</sup>

### **III. The Proposed Rules Must Be Analyzed Under NEPA.**

The Services have a duty under NEPA to analyze the significant effects of the Proposed Rules, and to circulate the analysis for public review and comment. But instead of performing the required analysis, the Services merely invite public comment on whether NEPA applies. *See* 83 Fed. Reg. at 35,177, 35,191, 35,200. As discussed below, the Proposed Rules constitute a major federal action significantly affecting the quality of the human environment and they are not subject to a categorical exclusion. As such, the Services were required to request comments on the appropriate scope of environmental review and then prepare, and notice for public comment, an Environmental Impact Statement (“EIS”) analyzing the Proposed Rules’ potential impacts before, or in tandem with, their publication. The Proposed Rules thus violate NEPA and must be withdrawn. At the very least, the Services must suspend rulemaking for the Proposed Rules, request NEPA scoping comments, and prepare an EIS.

#### **A. The Services Are Required to Prepare an EIS for the Proposed Rules.**

The Agencies have failed to comply with their statutory duty to publish an EIS. NEPA is the “basic national charter for protection of the environment,” 40 C.F.R. § 1500.1(a), enacted in recognition of “the profound impact of man’s activity on the interrelations of all components of the natural environment,” 42 U.S.C. § 4331(a). The fundamental purposes of the statute are to ensure that “environmental information is available to public officials and citizens before

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<sup>62</sup> *See* FWS Region 6, ENDANGERED SPECIES ACT SPECIAL RULES, QUESTIONS AND ANSWERS (Feb. 2014) (describing value of developing species-specific rules), *available at* [https://www.fws.gov/mountain-prairie/factsheets/ESA%20SpecialRules%20Factsheet\\_020714.pdf](https://www.fws.gov/mountain-prairie/factsheets/ESA%20SpecialRules%20Factsheet_020714.pdf).

<sup>63</sup> *See also* 16 U.S.C. § 1533(b)(3)(A)-(B) (timeframes for FWS action on ESA listing petitions).



decisions are made and before actions are taken,” and that “public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.” *Id.* § 1500.1(b)-(c). NEPA thus requires agencies to take a “hard look” at the environmental consequences of their actions before deciding whether and how to proceed. *Sierra Club v. U.S. Army Corps of Eng’rs*, 803 F.3d 31, 37 (D.C. Cir. 2015). Agencies must prepare an EIS for “major Federal actions significantly affecting the quality of the human environment,” 42 U.S.C. § 4332(2)(C), including where “substantial questions are raised as to whether a project may cause significant environmental impacts,” *Friends of the Wild Swan v. Weber*, 767 F.3d 936, 946 (9th Cir. 2014).

The Services plainly violated their NEPA obligations here. As an initial matter, it is the Services’ obligation to perform the required assessment of whether an EIS is required, and they cannot shirk that duty or delegate it to the public by requesting that stakeholders commenting on the Proposed Rules explain why they do, or do not, require an EIS. In any event, there can be no doubt that the Proposed Rules constitute a “major federal action” requiring the preparation of an EIS. The Council on Environmental Quality’s NEPA regulations provide, and numerous courts have confirmed,<sup>64</sup> that a “major federal action” includes “new or revised agency rules [and] regulations[.]” 40 C.F.R. § 1508.18(a).

And it is likewise clear that the Proposed Rules will significantly affect the environment. NEPA regulations require that both the context and the intensity of an action be considered in determining whether an action may significantly affect the environment, including “[t]he degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.” 40 C.F.R. § 1508.27. The presence of just “one of these factors may be sufficient to require the preparation of an EIS in appropriate circumstances.” *Ocean Advocates v. U.S. Army Corps of Eng’rs*, 402 F.3d 846, 865 (9th Cir. 2005).

As discussed above, the Proposed Rules, if adopted, are likely to cause numerous and profound harms to imperiled species. For example, the Proposed Rules would limit the designation of critical habitat; result in fewer listings of—and significantly less protection for—threatened species; increase the likelihood that species will be delisted; limit the scope of section 7 consultations; and limit the circumstances under which the Services impose measures to reduce the impacts of federal actions on listed species, among other adverse impacts on imperiled species and their habitat. Thus, the Services thus must prepare an EIS for the Proposed Rules.

What is more, the Services should already have done so. The NEPA regulations make clear that “[a]gencies shall integrate the NEPA process with other planning *at the earliest possible time* to insure [sic] that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts.” 40 C.F.R. § 1501.2 (emphasis added). As the Supreme Court has explained, an EIS “is the outward sign that environmental

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<sup>64</sup> See, e.g., *California ex rel. Lockyer v. U.S. Dep’t of Agric.*, 575 F.3d 999, 1012-18 (9th Cir. 2009) (agency repeal of roadless rule and replacement with new regulations required NEPA review); *Humane Soc’y of the U.S. v. Johanns*, 520 F. Supp. 2d 8, 37-38 (D.D.C. 2007) (vacating federal rule requiring NEPA review); *Natural Res. Def. Council v. Duvall*, 777 F. Supp. 1533, 1536, 1542 (E.D. Cal. 1991) (setting aside federal rule due to failure to perform EIS).

values and consequences have been considered during the planning stage of agency actions. If environmental concerns are not interwoven into the fabric of agency planning, the ‘action-forcing’ characteristics of [NEPA] would be lost.” *Andrus v. Sierra Club*, 442 U.S. 347, 350–51 (1979). Thus federal agencies must have evaluated the environmental consequences of an action when they propose to undertake a qualifying major federal action, *Kleppe v. Sierra Club*, 427 U.S. 390, 406 & n.15 (1976), and certainly “prior to commitment to any actions which might affect the quality of the human environment,” *Sierra Club v. Peterson*, 717 F.2d 1409, 1415 (D.C. Cir. 1983) (emphasis in original); see also 40 C.F.R. § 1502.5 (EIS must be prepared “as close as possible to the time the agency is developing . . . a proposal . . . so that preparation can be completed in time for the final statement to be included in any recommendation or report on the proposal”); 1508.23 (defining “proposal” stage at which agency “is actively preparing to make a decision on one or more alternative means of accomplishing [its] goal”).<sup>65</sup> “If any ‘significant’ environmental impacts might result from the proposed agency action then an EIS must be prepared *before* the action is taken.” *Sierra Club*, 717 F.2d at 1415.

Here, the Services *should have* followed NEPA’s requirements to prepare a draft EIS for the Proposed Rules well before—or at the latest, at the same time as—publishing the Proposed Rules on July 25, 2018, to weave thorough understanding of environmental consequences into the planning process. By failing to publish an EIS before the close of the comment period, the Services have unlawfully foreclosed the opportunity for the public to understand and provide important feedback on the Proposed Rules’ environmental impacts. Because the Services published the Proposed Rules in violation of NEPA, they must be withdrawn. At the very least, the Services *must* suspend rulemaking on the Proposed Rules, request comments on the appropriate scope of environmental review under NEPA, and prepare and circulate a comprehensive draft EIS for comment to afford the public a meaningful opportunity to participate in the Services’ development of any final rules.

## **B. The Proposed Rules Are Not Eligible for A Categorical NEPA Exclusion.**

The Proposed Rules are not eligible for a categorical exclusion under NEPA. Agencies may invoke a categorical exclusion only for “a category of actions which do not individually or cumulatively have a significant effect on the human environment and which have been found to have no such effect in procedures adopted by a Federal agency in implementation of [NEPA] regulations[.]” 40 C.F.R. § 1508.4. No such circumstances are present here. FWS<sup>66</sup> and NMFS<sup>67</sup> have established categorical exclusions for policies and regulations of an administrative or procedural nature, none of which apply to the substantive, significant changes reflected in the

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<sup>65</sup> See also *Kleppe v. Sierra Club*, 427 U.S. 390, 405-06 (1976) (holding that, under § 102(2)(C) of NEPA, agency must have a final statement ready when it makes a recommendation or report on a proposal for federal action); *Sierra Club*, 803 F.3d at 37 (agencies must take a “hard look” at environmental consequences of their actions).

<sup>66</sup> U.S. Department of Interior, EXISTING CATEGORICAL EXCLUSIONS, at 6-9 (hereinafter “DOI Exclusions”), available at [https://www.doi.gov/sites/doi.gov/files/uploads/doi\\_and\\_bureau\\_categorical\\_exclusions\\_feb2018.pdf](https://www.doi.gov/sites/doi.gov/files/uploads/doi_and_bureau_categorical_exclusions_feb2018.pdf).

<sup>67</sup> See NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL ENVIRONMENTAL POLICY ACT HANDBOOK, Ver. 2.3 (May 2009), at. 22-29 (hereinafter “NOAA NEPA Handbook”), available at [http://www.nepa.noaa.gov/NEPA\\_HANDBOOK.pdf](http://www.nepa.noaa.gov/NEPA_HANDBOOK.pdf).

Proposed Rules. Indeed, the Ninth Circuit rejected a similar attempt to evade NEPA requirements in the context of National Forest planning, finding that replacement of substantive protections with a less-protective regulatory regime—as the Services are currently attempting to do with the Proposed Rules—qualifies as a major federal action that is not exempt from NEPA review. *California ex rel. Lockyer*, 575 F.3d at 1013-15.

*Even if* the Proposed Rules could otherwise qualify for coverage under the Services’ categorical exclusions (they do not), they would nonetheless present “extraordinary circumstances in which a normally excluded action may have a significant environmental effect,” and thus be subject to NEPA’s full requirements in any event. 40 C.F.R. § 1508.4. To that end, the Services exempt from categorical exclusions any actions that, among other things: may significantly impact species listed, or proposed to be listed, under the ESA; have uncertain or potentially significant environmental effects or have unique or unknown environmental risks; violate a federal, state, local, or tribal law imposed for protection of the environment; or may have controversial environmental effects. *See* NOAA NEPA Handbook at 22; DOI Exclusions at 2-3. While only one of these factors need apply to the Proposed Rules to remove them from consideration for a categorical exclusion, plainly several of them do, as the Proposed Rules would have significant negative impacts on, among other things, newly listed threatened species and on all listed species’ critical habitat. Additionally, the Proposed Rules violate the ESA itself in numerous ways, as detailed above. Thus, no categorical exclusion may be applied to the Proposed Rules, and NEPA analysis is required.

For all the above reasons, the Proposed Rules violate NEPA and must be withdrawn. At the very least, the Services must suspend rulemaking and follow all NEPA requirements, including noticing and seeking public comment on the proper scope of environmental review, and preparing and circulating a draft EIS for public comment.

## CONCLUSION

The Services' proposed Rules each chip away at the ESA's most important species protections, and together upend the ESA's decades-long policy of "institutionalized caution" and risk significant harm to the precious species the Act serves to protect. The Listing Rule takes aim at the Services' foundational species-listing and critical habitat designation decisions, infecting the Services' decisions with expressly irrelevant economic impact information, and limiting the extent to which the Services can consider and respond to the most pressing threats to species extinction, like climate change. The Interagency Consultation Rule renders the Act's core agency consultation program a sham, decreasing its frequency and diminishing its value by gutting its key definitions and substantive requirements. And the 4(d) Rule, with no sound explanation, altogether eliminates the take prohibition for newly listed threatened species, risking their existence while the Services work through their ever-present backlog. Given the Services' disregard for these harms and failure to evaluate the Proposed Rules' environmental damage, their promulgation would at once violate the ESA, the Administrative Procedure Act, and NEPA. As entities uniquely qualified to evaluate efforts to protect our nation's natural resources, the States urge the Services to immediately abandon all three unlawful, arbitrary, and harmful Proposed Rules.

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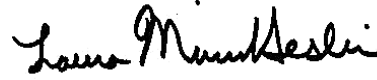


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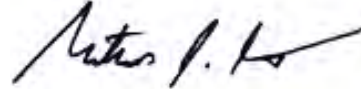


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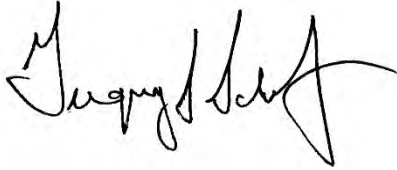


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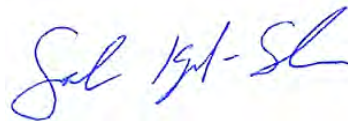


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**California Fish and Game Commission**  
**Tribal Committee (TC) Work Plan**  
**Topics and Timeline for Items Referred to TC from the California Fish and Game Commission**  
*Updated October 2018*

Topic	Type	Goal(s)	2018		2019
			Jun	Oct	Feb
			Sacramento	Fresno	Redding
<b>Special Projects</b>					
Co-management	TC Workgroup	Develop a vision statement and definition		X/R	
<b>Regulatory/Legislative</b>					
Kelp and algae harvest management	DFW Project	Updates; then recommendation and guidance		X	X
Discuss operating principles/practices and add TC to FCG meeting procedures	FGC	Amend Section 665, Title 14, California Code of Regulations	X	X	X/R
<b>Emerging Management Issues</b>					
FGC climate policy	FGC Policy	During development of a policy for FGC, make recommendations and provide guidance.			
Fishing communities	MRC Project	Updates and guidance		X	X
<b>Management Plans</b>					
Elk, sheep, deer, antelope, trout, abalone	DFW Projects			X	X
<b>Informational Topics</b>					
Cross-pollination with MRC and WRC	FGC Committee Coordination	Identification of tribal concerns and common themes that overlap between WRC and MRC	X	X	X
Annual tribal planning meeting for coordination and consultation, pursuant to Commission's tribal consultation policy	FGC Policy	(1) Share anticipated regulatory and policy topics to be considered this year, (2) identify tribal priorities from within topics, (3) develop collaborative interests, and (4) contribute to planning logistics for annual meeting.			X
Update on tribal participation in the Marine Protected Areas Statewide Leadership Team and implementation of the leadership team work plan	OPC Project				X
Update on Safeguarding California and Sea Level Rise	OPC Project				
Update on implementation of Proposition 64	DFW/LED Project			X	
FGC regulatory calendar update	FGC		X	X	X

FGC = California Fish and Game Commission    MRC = FGC's Marine Resources Committee    WRC = FGC's Wildlife Resources Committee  
DFW = California Department of Fish and Wildlife    LED = DFW's Law Enforcement Division    OPC = California Ocean Protection Council  
**KEY    X** = Discussion Scheduled    **R** = Recommendation developed and moved to FGC

**Commissioners**  
**Eric Sklar**, President  
Saint Helena

**Anthony C. Williams**, Vice President  
Huntington Beach

**Jacque Hostler-Carmesin**, Member  
McKinleyville

**Russell E. Burns**, Member  
Napa

**Peter S. Silva**, Member  
Jamul

STATE OF CALIFORNIA  
Edmund G. Brown Jr., Governor

## Fish and Game Commission



*Wildlife Heritage and Conservation*  
*Since 1870*

**Melissa Miller-Henson**  
**Acting Executive Director**  
P.O. Box 944209  
Sacramento, CA 94244-2090 (916) 653-4899  
fgc@fgc.ca.gov  
www.fgc.ca.gov

### TRIBAL COMMITTEE

Committee Co-Chairs: Commissioner Hostler-Carmesin and Commissioner Silva

**Meeting Agenda**  
**October 16, 2018, 1:30 p.m.**

**Radisson Fresno – Conference Center**  
**1055 Van Ness Avenue, Fresno, CA 93721**

This meeting may be audio-recorded.

**NOTE:** Please see important meeting procedures and information at the end of the agenda. Unless otherwise indicated, the California Department of Fish and Wildlife is identified as Department. All agenda items are informational and/or discussion only. The Committee develops recommendations to the Commission but does not have authority to make policy or regulatory decisions on behalf of the Commission.

Call to order

**1. Approve agenda and order of items**

**2. Public comment for items not on the agenda**

The Committee may not discuss or take action on any matter raised during this item, except to consider whether to recommend that the matter be added to the agenda of a future meeting. [Sections 11125, 11125.7(a), Government Code]

**3. Staff updates and other Committee updates**

- (A) Marine advisor for the Marine Resources Committee
- (B) Wildlife advisor for the Wildlife Resources Committee

**4. Department updates**

The Department will highlight items of note since the last Committee meeting, including potential updates from Fisheries Branch, Wildlife Branch, Marine Region and Law Enforcement Division.



**5. Committee operational framework**

- (A) Discuss operational practices and potential meeting procedures
- (B) Discuss costs and process for options to increase tribal participation in Tribal Committee meetings, including teleconferencing, online web conferencing, webcasting, and other approaches using available technology.

**6. Co-management vision statement**

Discuss and consider approving a recommendation on the draft co-management vision statement.

**7. Future agenda items**

- (A) Review work plan agenda topics and timeline
- (B) Potential new agenda topics for Commission consideration

Adjourn

## California Fish and Game Commission 2018 and 2019 Meeting Schedule

**Note:** As meeting dates and locations can change, please visit [www.fgc.ca.gov](http://www.fgc.ca.gov) for the most current list of meeting dates and locations.

<b>2018</b>			
<b>Meeting Date</b>	<b>Commission Meeting</b>	<b>Committee Meeting</b>	<b>Other Meetings</b>
October 17-18	Radisson Fresno Conference Center 1055 Van Ness Avenue Fresno, CA 93721		
November 14		<b>Marine Resources</b> Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814	
December 12-13	QLN Conference Center 1938 Avenida del Oro Oceanside, CA 92056		
<b>2019</b>			
<b>Meeting Date</b>	<b>Commission Meeting</b>	<b>Committee Meeting</b>	<b>Other Meetings</b>
January 10		<b>Wildlife Resources</b> Ontario	
February 5		<b>Tribal</b> Redding	
February 6-7	Redding		
March 19		<b>Marine Resources</b> Monterey or Marina	
April 17-18	Fresno or Bakersfield		
May 16		<b>Wildlife Resources</b> Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814	
June 11		<b>Tribal</b> Sacramento area	
June 12-13	Sacramento area		
July 11		<b>Marine Resources</b> San Clemente	
August 7-8	Mammoth or Bishop		
September 5		<b>Wildlife Resources</b> Santa Rosa	

<b>2019</b>			
<b>Meeting Date</b>	<b>Commission Meeting</b>	<b>Committee Meeting</b>	<b>Other Meetings</b>
October 8		<b>Tribal</b> Los Angeles area	
October 9-10	Los Angeles area		
November 5		<b>Marine Resources</b> Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814	
December 11-12	San Diego (proposed to move to Sacramento area)		

## **Other 2018 and 2019 Meetings of Interest**

### **Association of Fish and Wildlife Agencies**

- September 22-25, 2019, Saint Paul, MN

### **Pacific Fishery Management Council**

- November 1-8, 2018, San Diego, CA
- March 5-12, 2019, Vancouver, WA
- April 9-16, 2019, Rohnert Park, CA
- June 18-25, 2019, San Diego, CA
- September 11-18, 2019, Boise, ID
- November 13-20, 2019, Costa Mesa, CA

### **Western Association of Fish and Wildlife Agencies**

- January 3-6, 2019, Tucson, AZ
- July 11-16, 2019, Manhattan, KS

### **Wildlife Conservation Board**

- November 15, 2018, Sacramento, CA

## **IMPORTANT COMMITTEE MEETING PROCEDURES INFORMATION**

Welcome to a meeting of the California Fish and Game Commission's Tribal Committee. The Committee is chaired by up to two Commissioners; these assignments are made by the Commission.

The goal of the Committee is to allow greater time to investigate issues before the Commission than would otherwise be possible. Committee meetings are less formal in nature and provide for additional access to the Commission. The Committee follows the noticing requirements of the Bagley-Keene Open Meeting Act. It is important to note that the Committee chairs cannot take action independent of the full Commission; instead, the chairs make recommendations to the full Commission at regularly scheduled meetings.

The Commission's goal is the preservation of our heritage and conservation of our natural resources through informed decision-making; Committee meetings are vital in developing recommendations to help the Commission achieve that goal. In that spirit, we provide the following information to be as effective and efficient toward that end.

### **PERSONS WITH DISABILITIES**

Persons with disabilities needing reasonable accommodation to participate in public meetings or other Commission activities are invited to contact the Reasonable Accommodation Coordinator at (916) 651-1214. Requests for facility and/or meeting accessibility should be received at least 10 working days prior to the meeting to ensure the request can be accommodated.

### **SUBMITTING WRITTEN MATERIALS**

The public is encouraged to attend Committee meetings and engage in the discussion about items on the agenda; the public is also welcome to comment on agenda items in writing. You may submit your written comments by one of the following methods (only one is necessary): **Email** to [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov); **mail** to California Fish and Game Commission, P.O. Box 944209, Sacramento, CA 94244-2090; **deliver** to California Fish and Game Commission, 1416 Ninth Street, Room 1320, Sacramento, CA 95814; or **hand-deliver to a Committee meeting**.

### **COMMENT DEADLINES:**

The **Written Comment Deadline** for this meeting is **5:00 p.m. on October 4, 2018**. Written comments received at the Commission office by this deadline will be made available to Commissioners prior to the meeting.

The **Late Comment Deadline** for this meeting is **noon on October 12, 2018**. Comments received by this deadline will be marked "late" and made available to Commissioners at the meeting.

After these deadlines, written comments may be delivered in person to the meeting – please bring five (5) copies of written comments to the meeting.

The Committee **will not** consider comments regarding proposed changes to regulations that have been noticed by the Commission. If you wish to provide comment on a noticed

item, please provide your comments during Commission business meetings, via email, or deliver to the Commission office.

**Note:** Materials provided to the Committee may be made available to the general public.

## **REGULATION CHANGE PETITIONS**

As a general rule, requests for regulatory change need to be redirected to the full Commission and submitted on the required petition form, FGC 1, titled "Petition to the California Fish and Game Commission for Regulation Change" (Section 662, Title 14, CCR). However, at the Committee's discretion, the Committee may request that staff follow up on items of potential interest to the Committee and possible recommendation to the Commission.

## **SPEAKING AT THE MEETING**

Committee meetings operate informally and provide opportunity for everyone to comment on agenda items. If you wish to speak on an agenda item, please follow these guidelines:

1. Raise your hand and wait to be recognized by the Committee co-chair(s).
2. Once recognized, please begin by giving your name and affiliation (if any) and the number of people you represent.
3. Time is limited; please keep your comments concise so that everyone has an opportunity to speak.
4. If there are several speakers with the same concerns, please try to appoint a spokesperson and avoid repetitive comments.
5. If you would like to present handouts or written materials to the Committee, please provide five copies to the designated staff member just prior to speaking.
6. If speaking during public comment, the subject matter you present should not be related to any item on the current agenda (public comment on agenda items will be taken at the time the Committee members discuss that item). As a general rule, public comment is an opportunity to bring matters to the attention of the Committee, but you may also do so via email or standard mail. At the discretion of the Committee, staff may be requested to follow up on the subject you raise.

## **VISUAL PRESENTATIONS/MATERIALS**

All electronic presentations must be submitted by the **Late Comment Deadline** and approved by the Commission executive director before the meeting.

1. Electronic presentations must be provided by email or delivered to the Commission on a USB flash drive by the deadline.
2. All electronic formats must be Windows PC compatible.
3. It is recommended that a print copy of any electronic presentation be submitted in case of technical difficulties.
4. A data projector, laptop and presentation mouse will be available.

**LASER POINTERS** may only be used by a speaker during a presentation.

**Marine Resources Committee (MRC) 2018 Work Plan**  
**Scheduled Topics and Timeline for**  
**Items Referred to MRC from California Fish and Game Commission**  
Updated October 1, 2018

Topic	Category	2018		2019		
		JUL	NOV	MAR	JUL	NOV
		San Clemente	Sacramento	Monterey/ Marina	San Clemente	Sacramento
<b>Planning Documents</b>						
Herring FMP Updates	FMP	X / R				
MLMA Master Plan for Fisheries - Implementation Updates	Management Plan Implementation	X	X		X	X
Statewide MPAs Monitoring Action Plan	MPA Monitoring Plan	X				
MLMA Master Plan for Fisheries - Implementation Updates	Master Plan	X	X	X	X	X
Aquaculture Programmatic Environmental Impact Report (PEIR)	Programmatic Plan		X	X/R		
<b>Regulations</b>						
Sport Fishing	Annual Rulemaking			X		
Aquaculture Lease Best Management Practices (BMP) Plan Requirements	DFW-FGC Project/ Rulemaking	X	X/R			
Kelp & Algae Commercial Harvest	DFW Project/ Rulemaking			X		
<b>Emerging/Developing Management Issues</b>						
Aquaculture State Water Bottom Leases: Existing and future lease considerations	Lease Management Review					
Box crab experimental fishing permit program and application criteria	DFW Project	X				
<b>Special Projects</b>						
California's Coastal Fishing Communities	MRC project	X / R	X/R			
<b>Informational / External Topics of Interest</b>						
Marine Debris and Plastic Pollution (updates upon request)	Informational					
BOEM Offshore Wind Energy Project (updates upon request)	Informational					
Lobster Advisory Committee lessons learned report - presentation by Heal the Bay (NEW)	Informational		X			

**KEY:    X    Discussion scheduled    X/R    Recommendation developed and possible move to FGC**

State of California  
Department of Fish and Wildlife

RECEIVED  
CALIFORNIA  
FISH AND GAME  
COMMISSION

2018 OCT -4 AM 9:01

**M e m o r a n d u m**

Date: October 3, 2018

To: Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Agenda Item for the October 17, 2018 Fish and Game Commission Meeting**  
**Re: Notice of Intent to Adopt Section 29.06, Recreational Take of Purple Sea Urchin**

The Department of Fish and Wildlife (Department) requests the Fish and Game Commission (Commission) to authorize publishing notice of its intent to add Section 29.06, Recreational Take of Purple Sea Urchin, Title 14, California Code of Regulations. Authorization of this request to publish notice will allow for discussion on December 12, 2018, and possible adoption on February 7, 2019.

Presently, this request is not accompanied by an Initial Statement of Reasons describing the necessity for the new regulation. Department and Commission staff are currently evaluating the effects on the recovery of kelp and abalone attributable to the emergency regulation Section 29.11. The emergency regulation increased the recreational daily take limit to 20 gallons along the coast of Sonoma and Mendocino counties. The regulation has been in effect since May 10<sup>th</sup>, and (if extended by the Commission under separate action) will remain in effect at least through the first week of February. Other factors concerning ocean conditions will also be considered. The Department will develop an Initial Statement of Reasons for this rulemaking following Commission authorization.

The Department recommends that the proposed regulations include the following:

- Increase the daily recreational take limit to 40 gallons;
- Apply the take allowance to waters off Sonoma, Mendocino, and Humboldt counties
- Include an option to extend the take allowance to Include waters off Del Norte county

If you have any questions or need additional information, please contact Dr. Craig Shuman, Marine Regional Manager at (916) 445-6459. The public notice for this rulemaking should identify Environmental Scientist, Anthony Shiao as the Department's point of contact. His contact information is (805) 560-6056 or [Anthony.Shiao@Wildlife.ca.gov](mailto:Anthony.Shiao@Wildlife.ca.gov).



Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission  
October 3, 2018  
Page 2 of 2

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2018 APR -6 AM 11:02

## Memorandum

Date: April 4, 2018

To: Valerie Termini  
Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Agenda Item for the June 20-21, 2018 Fish and Game Commission Meeting**  
**Re: Designation of the Harvest of Non-Cancer Crabs as an Emerging Fishery**

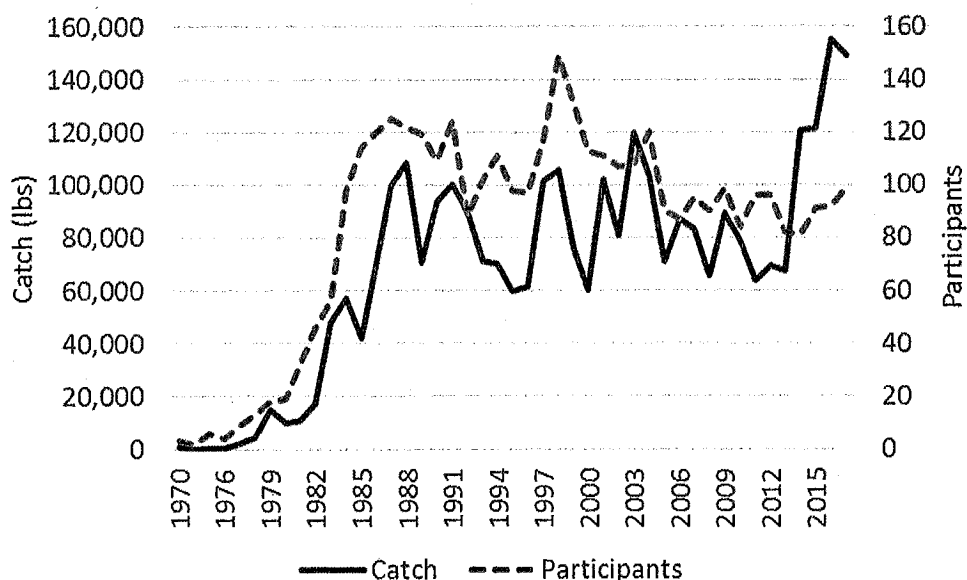
California Fish and Game Code (FGC) §7090 of the Marine Life Management Act (MLMA) requires the Fish and Game Commission (Commission), based upon the advice and recommendations of the Department of Fish and Wildlife (Department), to encourage, manage, and regulate emerging fisheries. Consistent with the criteria outlined in FGC §7090 and Commission policy, the Department has determined that the fishery for non-Cancer crab is an emerging fishery. Based on presented information and discussions regarding brown box crab and California king crab at the Commission's Marine Resource Committee meeting on November 2017, the Commission directed the Department to develop a regulatory proposal to limit allowable incidental take of non-Cancer crab due to rising catch and uncertain sustainability. An emerging fishery designation is necessary for the Commission to exercise the authority to adopt new management measures.

Incidental take of non-Cancer crab (except Tanner crab) is permitted when using traps to target rock crab south of Monterey County (FGC § 8284 (c)), lobster (FGC § 8250.5 (b)), and Dungeness crab (FGC § 8284(a)). Current regulations place no restrictions on the amount of non-Cancer crab that may be taken as long as it is taken incidentally to the target species. Landings of non-Cancer crab reached an all-time high of 155,000 pounds in 2016 (Figure 1). Species the Department tracks include brown box crab (*Lopholithodes foraminatus*), armed box crab (*Platymera gaudichaudii*), California king crab (*Paralithodes californiensis*), and sheep crab (*Loxorhynchus grandis*). The increase in brown box crab (hereafter referred to as box crab) has been most noteworthy. Other species have seen less pronounced and consistent increases, but have also reached previously unseen peaks in catch in recent years. Little biological information exists for these species to determine sustainable levels of harvest.

Box crab and California king crab are relatively deep-water crabs typically inhabiting depths between 150-550 meters. It is likely that the increased landings can be attributed to a combination of a change in fishing behavior (*i.e.*, rock crab fishermen fishing deeper) and developing markets for alternative crab species.

For box crab, current catch levels as well as research surveys indicate a high biomass that may be suitable for exploitation. However, deep-water species are often slow growing and long-lived and therefore cannot sustain high exploitation rates. Additionally, research in British Columbia showed that females produce larvae only every two years.

The Department expects to request the Commission notice a proposed regulation change at its June meeting that would limit possession and landings of incidentally harvested non-Cancer crabs (all species combined) in trap fisheries to no more than 100 pounds. A more restrictive limit for species in the Lithodidae family (box and king crabs) would be set at 25 pounds (*i.e.*, up to 25 pounds of the total 100 may be made up of box crab or king crab). The more restrictive limit for Lithodidae species is necessary due to the rapidly growing interest in these species. Additionally, the Department has been directed by the Commission to pursue development of an experimental gear permit for box crab. Associated plans for collaborative research with fishermen to determine sustainable harvest levels would be hampered by uncontrolled incidental harvest. Species not in the Lithodidae family (*e.g.*, sheep crab) would be subject to a higher, 100 pound limit because this species has sustained relatively higher landings over the past three decades. However, the Department recommends a limit is also important for sheep crab to safeguard against potential future run-away incidental harvest as new markets develop.



Non-Cancer crab commercial landings and number of individuals making landings, 1970 – 2017.

The lack of existing regulations and trend of increasing landings, demonstrate that the incidental take of non-Cancer crabs satisfies the criteria laid out in the MLMA for "Emerging Fisheries".

The relatively small size of this fishery, limited available data, and lack of fishery provided funds precludes the preparation of a fishery management plan for this species. The Department therefore recommends the Commission continue the approach of developing regulations to address the rising incidental harvest, followed by the use of experimental gear permits to fill information gaps and promote a sustainable fishery.

If you have any questions or need additional information, please contact Dr. Craig Shuman, Marine Regional Manager, at (916) 445-6459.

cc: Stafford Lehr, Deputy Director  
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## Memorandum

2018 JUN -8 AM 8:30

Date: June 6, 2018

To: Valerie Termini  
Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Agenda Item for the June 20 - 21, 2018 Fish and Game Commission Meeting**  
**Re: Request for Authorization to Publish Notice of Commission's Intent to Add**  
**New Section 126.1, and Amend Subsection 125.1(c)(3) and Section 126,**  
**Specifying Incidental Take Allowances for Crabs other than the Genus Cancer**

Attached please find the Initial Statement of Reasons (ISOR), which proposes to add a new Section 126.1 and amend subsection 125.1(c)(3) and Section 126, Title 14, California Code of Regulations, Re: Specifying Incidental Take Allowances for Crabs other than the Genus Cancer. Under current regulations, incidental take of non-Cancer crabs is permitted in the target trap fisheries for rock crab, Dungeness crab, and lobster, with no limit on amount. The Department determined the fishery for non-Cancer crabs to be an emerging fishery in April 2018, and under the Marine Life Management Act, the Department must recommend management measures for the Commission's consideration to ensure sustainability (Fish and Game Code (FGC) § 7090). Proposed limits for box and king crab detailed in the attached ISOR are designed to slow current harvest rates and allow for development of an experimental gear permit for box crab, under authority of FGC § 8606, to investigate the potential for a target fishery. The proposed total allowable catch (TAC) for sheep crab is intended to maintain the current harvest level and prevent potential future runaway incidental harvest.

Currently, Section 126, Title 14, California Code of Regulations governs the commercial harvest of Tanner crab, another non-Cancer species. The title of Section 126 would be changed to "Commercial Take of Crabs not in the Genus Cancer in Trap Gear." Existing regulations for the Tanner crab (*Chioneocetes* spp.) fishery would be shifted to a new Section 126.1. The new Section 126 would contain the following subsections: (a) to define Cancer crabs, (b) to create landing limits for non-Cancer crabs taken incidental to other target species in trap gear, and (c) to require all crabs be landed prior to use as bait. Possession and landing of species in the Lithodidae family (box and king crabs) would be limited to no more than 25 pounds per species. Sheep crab would be subject to a TAC of 95,000 pounds annually. Sheep crab is used as a bait source in fish traps. The requirement to land all crab prior to use as bait is necessary to accurately track the TAC for sheep crab and to assess and craft future management measures for all non-Cancer species.

Valerie Termini  
Executive Director  
Fish and Game Commission  
June 6, 2018  
Page 2

The attached NOE has been prepared pursuant to Section 15062 of the California Environmental Quality Act (CEQA) Guidelines. Since the NOE is not anticipated to change, this early submission with the ISOR gives the Commission notice of the Department's recommendation to rely on CEQA exemption for the proposed actions.

After review pursuant to CEQA Guidelines Section 15061, the Department concludes that proposed rulemaking falls within the Class 7 categorical exemption (CEQA Guidelines Section 15307). The regulations are intended to reduce the risk of overexploiting the non-Cancer crab species, many of which are poorly understood, in the commercial invertebrate trap fisheries. Staff has also reviewed all of the available information possessed by the Department relevant to the issue and does not believe that the Commission's reliance on the Class 7 categorical exemption is precluded by the exceptions set forth in CEQA Guidelines Section 15300.2.

If you have any questions regarding this item, please contact Dr. Craig Shuman, Regional Manager, Marine Region, at (916) 445-6459. The public notice for this rulemaking should identify Environmental Scientist Julia Coates as the Department's point of contact. Ms. Coates can be reached at (805) 730-1328 or [Julia.Coates@wildlife.ca.gov](mailto:Julia.Coates@wildlife.ca.gov).

#### Attachment

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STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION

Add Section 126.1 and Amend subsection 125.1(c)(3) and Section 126,  
Title 14, California Code of Regulations  
Re: Specifying Incidental Take Allowances for Crabs other than the Genus Cancer

- I. Date of Initial Statement of Reasons: May 2, 2018
- II. Dates and Locations of Scheduled Hearings:
  - (a) Notice Hearing: Date: June 20, 2018  
Location: Sacramento, CA
  - (b) Adoption Hearing: Date: October 17, 2018  
Location: Fresno, CA
- III. Description of Regulatory Action:
  - (a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

Under current law, commercial fishermen may incidentally take unlimited amounts of crabs not in the genus *Cancer* (non-Cancer crabs) when targeting rock crab, lobster, and Dungeness crab. The specific statutes and regulations include subdivision 8284(c), Fish and Game Code (FGC), and subsection 125.1(c), Title 14, California Code of Regulations (CCR) for rock crab, subdivision 8250.5(b), FGC, for lobster, and subdivision 8284(a), FGC, for Dungeness crab fisheries. The FGC provides a general definition of bycatch (incidental take) that does not give guidance on acceptable amounts (Section 90.5, FGC), but FGC and CCR sections on specific species and gear types do specify rules for retaining non-target species in some cases.

In recent years the Department of Fish and Wildlife (Department) has documented increasing landings of non-Cancer crabs. These species are intended to be taken only incidentally to the species subject to the permitted fishery. This increase is likely due to a combination of two reasons: 1) some fishermen are actively targeting non-Cancer crabs, and 2) non-Cancer crabs are more commonly retained as new markets and greater demand have developed. Regardless of cause, incidental take is often subject to little

regulatory control. The lack of guidance on appropriate incidental amounts is allowing for increasing numbers of proportionally large landings of the incidental species. Specificity in incidental allowances is necessary to provide clarity and to prohibit the targeting of species for which appropriate safeguards against unsustainable practices have not been developed. Additionally, when these species do not meet the criteria for an “established fishery” defined in Section 7090, FGC, they are considered emerging fisheries, and upon determination from the Department Director, the Fish and Game Commission (Commission) has authority to adopt management measures. The proposed regulations establish limits on the incidental take of non-Cancer crabs in the target invertebrate trap fisheries for which take is allowed.

Landings of non-Cancer crabs reached a level not previously observed of 155,000 pounds in 2016 (Figure 1). The species that the Department tracks include brown box crab (*Lopholithodes foraminatus*), armed box crab (*Platymera gaudichaudii*), California king crab (*Paralithodes californiensis*), and sheep crab (*Loxorhynchus grandis*, also known as spider crab). Little biological information exists for any of these species, making determination of sustainable harvest levels difficult. The increase in brown box crab (hereafter referred to as box crab) has been most noteworthy (Figure 2) and is primarily attributable to take in rock crab traps. However, substantial landings in Dungeness crab traps account for the peak seen in 2001. The Commission has received two formal requests for experimental gear permits (EGP) under authority of Section 8606, FGC, to target box crab and, at its December 2017 meeting, directed the Department to develop a proposal for EGPs. Department staff have also received queries from approximately 25 fishermen interested in applying for EGPs for box crab. As prescribed by the Marine Life Management Act (Sections 7050 et seq., FGC), the Department is obligated to sustainably manage the state’s living marine resources. Therefore, as the landings of incidentally caught species rise to become emerging fisheries, the Department is obligated to collect the necessary information and recommend appropriate regulations to the Commission (Section 7090, FGC). Thus, precautionary limits for all non-Cancer species are proposed, and subsequent research to inform appropriate future management measures will be conducted as resources allow and prioritized by degree of conservation or management concern.

Department landings data for box crab beginning in 1981 show take with a variety of gear types across the state from Crescent City to San Diego. The number of fishermen landing box crabs has only modestly increased, highlighting relatively large landings as responsible for the overall increase (Figure 3). However, interest in targeting box crabs is expanding. Box crab



landings began to increase during a period of record high landings of rock crab (Figure 4), perhaps reflecting development of new markets. Three years of unprecedented high landings in the rock crab fishery were followed by decline in 2016 and 2017. Rock crab fishery participants have communicated that in an effort to improve poor rock crab catch, some in the fishery are setting traps in deeper water than is typical for rock crab, resulting in increased incidental box crab catch.

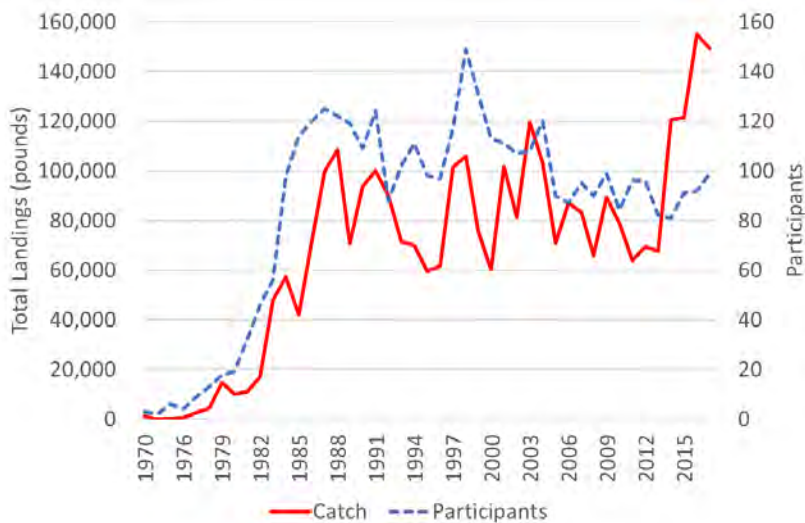


Figure 1. Total landings of non-Cancer crab (Brown box, California king, sheep, armed box) in pounds and number of individuals making landings (participants).

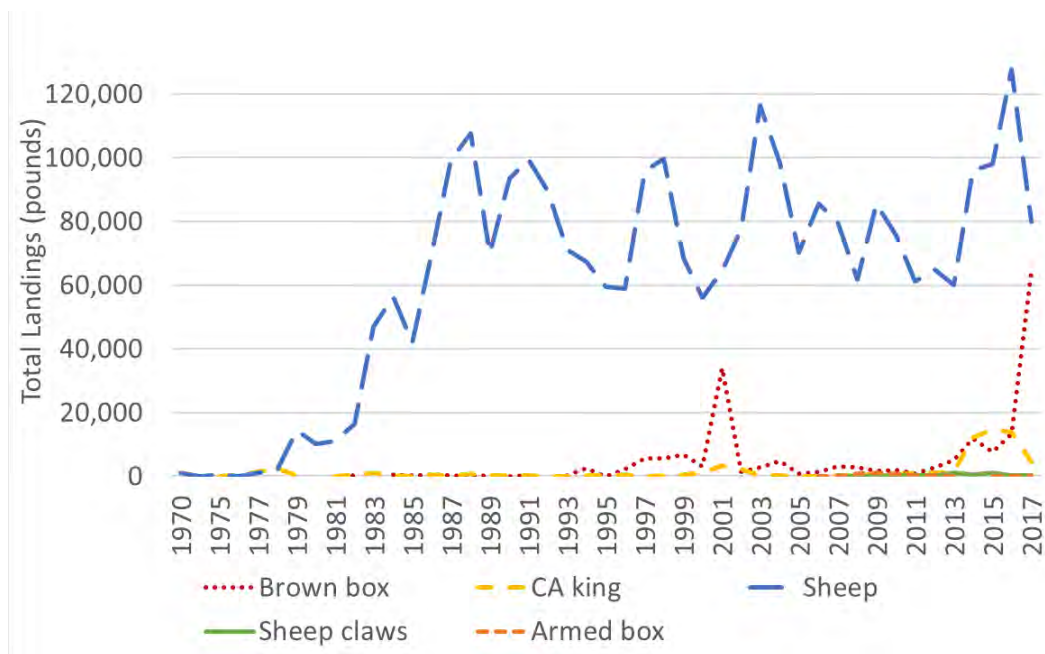


Figure 2. Non-Cancer crab landings by species (pounds).

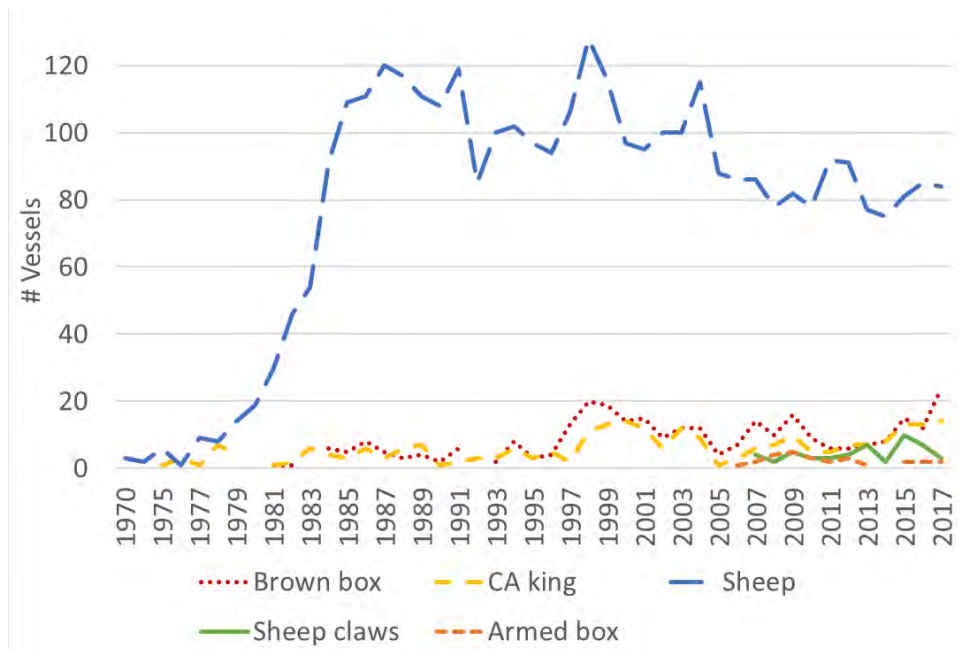


Figure 3. Number of vessels landing non-Cancer crabs by species.

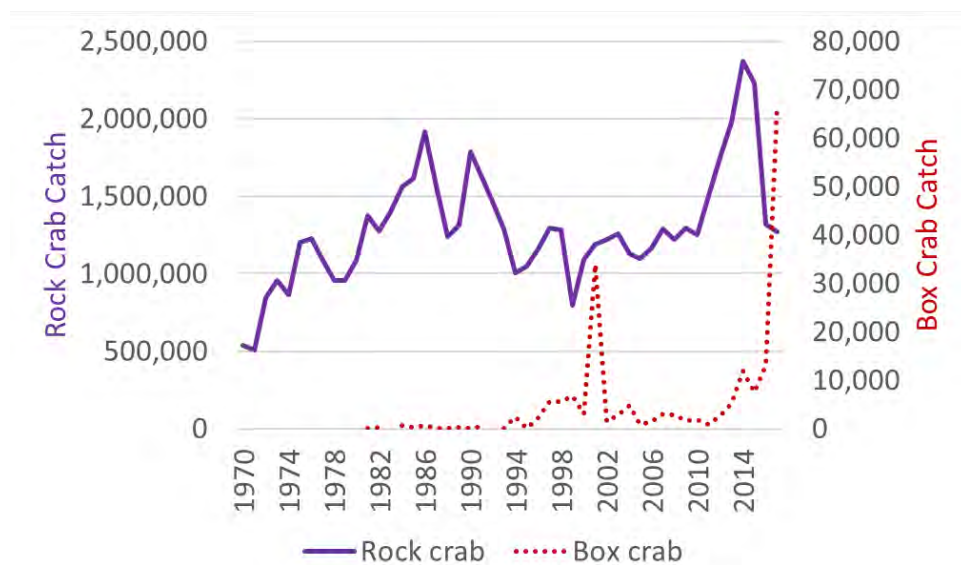


Figure 4. Total landings of rock crab and brown box crab (pounds).

### **Amend Section 126 and add Section 126.1**

#### **Proposed Changes**

The proposed regulatory change would amend the existing Section 126, which currently applies to the commercial take of Tanner crab. The title of 126 would be changed to “Commercial Take of Crabs not in the Genus *Cancer* in Trap Gear.” Tanner crab (*Chioneocetes* spp.) are non-Cancer crabs, and existing regulations regarding this fishery would be shifted to new Section 126.1. The new Section 126 would contain the following subsections: (a) to define Cancer crabs, (b) to create landing limits for non-Cancer crabs taken incidental to other target species in trap gear, and (c) to require all crabs be landed prior to use as bait. Possession and landing of species in the Lithodidae family (box and king crabs) would be limited to no more than 25 pounds each. Additionally, when possessing or landing species in the Lithodidae family, an equal or greater amount of the target species (rock crab, lobster, or Dungeness crab) must also be possessed or landed. Sheep crab would be subject to a total allowable catch of 95,000 pounds annually.

#### **Rationale**

Catch of box and king crabs has increased in recent years and there is interest among fishermen in development of target fisheries. Little is known

about these species. Therefore, a conservative landing limit is proposed while the feasibility of a target fishery is explored through an EGP program. The limited information available on habitat, past harvest, and reproductive biology also suggests precautionary limits are appropriate. Limiting catch of sheep crab to levels similar to the status quo will allow the Department to improve management and prevent potential future runaway incidental take.

Box and king crabs inhabit relatively deep water and range from Alaska and Monterey, respectively, to at least as far south as the Mexican border. Box crab typically inhabit depths between 550-1600 feet in California (Wicksten 1982), while California king crab inhabits a narrower range within those depths. Experimental fisheries for box crab have been tested in British Columbia and California (reviewed in Zhang (1999)) and in Washington (Daniel Ayres, Washington Department of Fish and Wildlife, personal communication), but none of these efforts developed into a sustained and directed commercial fishery. A limited developmental fishery existed in Oregon until 2009, and presently box crab may only be landed incidentally to Dungeness crab. In Oregon, landings tend to be modest and are driven by the availability of Dungeness crab.

Research in British Columbia waters has shown that females produce larvae only every other year (Duguid and Page 2011). This reproductive schedule may relate to occupation of a relatively deep, low-nutrient habitat. Additionally, female box and king crabs do not store sperm packets from male crabs. In Brachyuran crabs, this ability allows females to mate opportunistically and use the sperm to fertilize her eggs when the eggs are fully developed. In contrast, female box and king crabs must molt, extrude eggs, and mate to fertilize the eggs within a short space of time, requiring that a sufficient density of male crabs is available to ensure mating success. For these reasons, box crab may not represent a good candidate for commercial exploitation and particularly not a male-only fishery. It is possible that the species exhibits an accelerated reproductive schedule in California waters, but the necessary research has not been conducted.

The average landing amount of box crab through 2012 was approximately 100 pounds (Figure 5). A retrospective analysis of total annual landings if a 25-pound limit had been in place dramatically reduces total catch and, therefore, represents a very conservative limit (Figure 5). Box crab are generally in depths that do not overlap with other target invertebrate trap fisheries (i.e. past landings may not have been truly incidental). If a 25-pound limit had been in place, many of these landings may not have occurred at all because this amount would not have compensated for the need to set gear in more remote locations. The addition of a requirement to possess or land an

equal or greater amount of the target species (rock crab, lobster or Dungeness crab) when possessing or landing Lithodid species (box or king crabs) is intended to clarify that take of Lithodid species is only to be incidental to these target species.

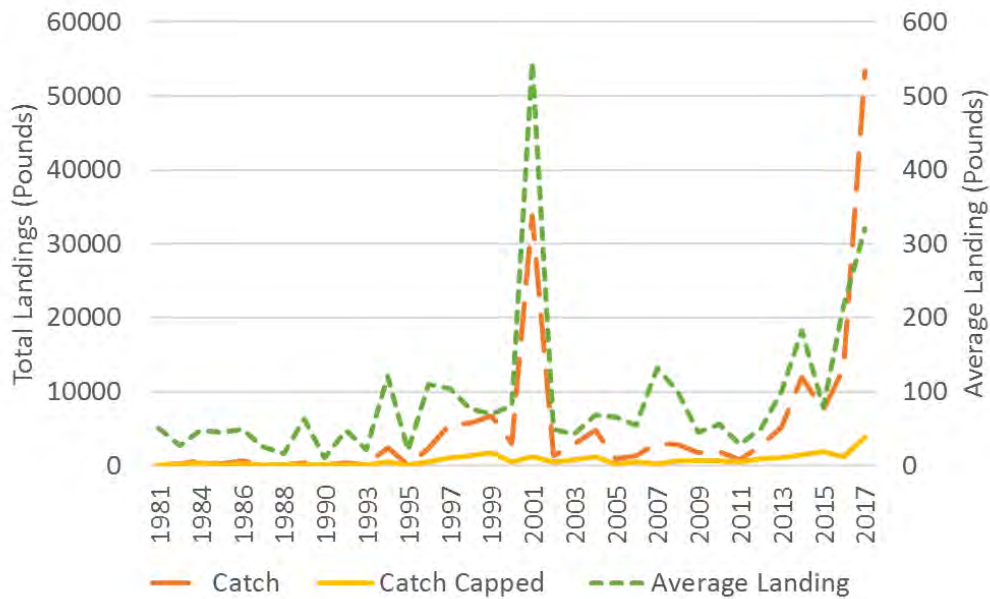


Figure 5. Total box crab catch (orange) and average landing amounts (green). Retrospective analysis of total box crab catch if a limit of 25 pounds per landing (yellow) had been in place.

The conservative limit for Lithodid crabs (box and king) is proposed for several reasons. The Department expects that the number of fishermen wishing to target box and king crab is likely to expand as new markets for the species have recently been developed and may expand further. Additionally, as noted above, little is known about the biology of these species, and organisms in these relatively deep-water habitats often exhibit slow growth and reproductive rates. Despite this, fisheries-independent trawl surveys conducted by NOAA to assess groundfish populations indicate there may be a high biomass of box crab off California that may support targeted take. Research associated with the EGP will be designed to improve biomass estimates and our understanding of life history characteristics. Maximizing allowable directed take of box crab through the EGP while remaining within a precautionary level will require maintaining low levels of incidental take. Following completion of EGP research, allowable targeted and incidental take may be revised.

A total allowable catch (TAC) for sheep crab is intended to allow for higher landings of this species, which may be of less conservation concern. While also only taken as an “incidental” species, relatively large and stable catch levels of sheep crab have been observed since the 1980s (Figure 2). The stability of the catch indicates this level of take may be sustainable, and the shallower habitat of the species may be conducive to greater productivity. Additionally, sheep and rock crab were previously harvested for a combined-species, claw-only market. While the exact poundage of whole sheep crab harvest that may be attributed to that fishery is unknown, it was likely substantial in the 1980s and did not result in reduced productivity for the whole crab market (Figure 2).

The recommended TAC of 95,000 pounds is intended to allow for continued sheep crab catch similar to current levels but to prevent uncontrolled growth. Department landing records show an annual average of approximately 83,000 pounds of sheep crab was landed from 2013 to 2017. A calendar year was chosen for tracking the TAC both for simplicity and because total landings by month are not highly variable but are slightly lower near the end of the year. In some cases, sheep crab are caught at sea and used as bait in finfish traps within the same trip. Sheep crab used in this manner is not required to be landed. Thus, the volume is not reflected in catch records. A 15 percent increase was added to the average landed catch as an estimate of un-landed catch, resulting in a TAC of 95,000 pounds. The 15 percent estimate of un-landed catch used in calculating the 95,000-pound TAC for sheep crab represents the best professional judgement of the department’s invertebrate fisheries staff, providing a reasonable initial metric for adaptive management that can be adjusted as more information becomes available. An accurate understanding of the total amount of sheep crab take will be necessary to implement the proposed TAC for sheep crab and for future efforts to assess and craft management measures for this, as well as all other non-Cancer crab species. Therefore, the Department is proposing a requirement for all non-Cancer crab to be brought ashore in the whole and recorded on landing receipts regardless of intended use. The proposed regulation would require individuals wishing to catch non-Cancer crabs for use as bait to return to port, land the crab, complete a landing receipt pursuant to subdivision 8047(a)(1), FGC, and then use the crab as bait on a subsequent trip. If desired, fishermen have the ability to issue a landing receipt to themselves pursuant to FGC Article 7 (commencing with section 8030) of Chapter 1. For enforcement purposes, fishermen would also be required to keep copies of landing receipts documenting the catch of crabs that are used as bait on the fishing vessel for a minimum of 30 days from the date of landing as listed on the landing receipt.

### **Amend Subsection 125.1(c)(3)**

#### **Proposed Regulations**

The proposed regulatory change would amend subsection 125.1(c)(3), which details allowances for incidental take of other species when targeting rock crab. The incidental allowances would remain unchanged except for reference to the new subsection 126(b) specifying a limit on non-Cancer crabs.

#### **Rationale**

The addition of a reference to 126(b) is intended to provide clarity regarding non-Cancer crab incidental limits.

#### **(b) Goals and Benefits of the Regulations**

The Pacific Ocean and its rich marine living resources are of great environmental, economic, aesthetic, recreational, educational, scientific, nutritional, social, and historic importance to the people of California.

It is the policy of the state to ensure the conservation, sustainable use, and, where feasible, restoration of California's marine living resources for the benefit of all the citizens of the state. The objective of this policy include, but are not limited to, the following:

- Conserve the health and diversity of marine ecosystems and marine living resources.

- Allow and encourage only those activities and uses of marine living resources that are sustainable.

- Recognize the importance to the economy and the culture of California of sustainable sport and commercial fisheries and the development of commercial aquaculture consistent with the marine living resource conservation policies of this part.

The proposed regulation benefits the environment by prohibiting the overexploitation of several non-Cancer crab species before adequate management measures could be developed for dedicated targeted fisheries. The proposed regulation will also allow for development of an experimental gear permit program for box and king crab designed to conduct research on species biology and potential appropriate management measures.

(c) Authority and Reference Sections from Fish and Game Code for Regulation:

Authority: Sections 713, 1050, 5508, 7090, 7857, 8026 and 8282, Fish and Game Code.

Reference: Sections 1050, 1052, 5508, 7050, 7051, 7055, 7056, 7058, 7090, 7850, 7857, 7881, 8026, 8031, 8040, 8041, 8042, 8043, 8046, 8047, 8051, 8250.5, 8275, 8281, 8282, 8284, 8834, 9000, 9001, 9001.7, 9002, 9003, 9004, 9005, 9006, 9007, 9008 and 9011, Fish and Game Code.

(d) Specific Technology or Equipment Required by Regulatory Change:

None.

(e) Identification of Reports or Documents Supporting Regulation Change:

1. Duguid, W. D., & Page, L. R. (2011). Biennial reproduction with embryonic diapause in *Lopholithodes foraminatus* (Anomura: Lithodidae) from British Columbia waters. *Invertebrate Biology*, 130(1), 68-82.
2. Wicksten, M. K. 1982. Crustaceans from baited traps and gill nets off southern California. *Calif. Fish and Game* 68(4): 244-248.
3. Zhang, Z. Y., Workman, G. D., & Phillips, A. C. (1999). A review of the biology and fisheries of the box crab (*Lopholithodes foraminatus* Stimpson) in British Columbia. Fisheries & Oceans Canada, Canadian Stock Assessment Secretariat.
4. Memorandum, April 4, 2018, To: Valerie Termini, Executive Director of the Fish and Game Commission, From: Charlton H. Bonham, Director of the Department of Fish and Wildlife, Subject: Agenda Item for the June 20-21, 2018 Fish and Game Commission Meeting Re: Designation of the Harvest of Non-Cancer Crabs as an Emerging Fishery

(f) Public Discussions of Proposed Regulations Prior to Notice publication:

1. Fish and Game Commission, Marine Resource Committee meeting, November 9, 2017, Marina, CA
2. Meeting with crab and lobster fishery constituents, April 17, 2018, E.P. Foster Library, Ventura, CA

IV. Description of Reasonable Alternatives to Regulatory Action:

(a) Alternatives to Regulation Change:

Possession and landing limit for all non-Cancer species combined



A possession and landing limit for all non-Cancer species combined is a potential alternative to the proposed combination of a possession and landing limit for Lithodid species and a TAC for sheep crab. The Department initially proposed to constituents a 100-pound limit for all non-Cancer species combined and a more restrictive limit of 25 pounds for any Lithodid species within the 100 pounds. The larger limit was based on a long-term average landing amount of 80 pounds for sheep crab and was intended to allow for annual catch of sheep crab to continue within a range similar to previous observations. Crab fishermen noted that sheep crab landings are highly variable and a 100-pound limit may not allow for adequate range around the average which has a standard deviation of plus or minus 116 pounds. Additionally, the Department learned that individual landings amounts in the catch records do not accurately reflect catch amounts as they are brought to the dock. Rather, they may reflect subsets of the catch that are landed in small increments after being held in receivers. Therefore, the true, larger catch amount is obscured from the records. Based on this constituent feedback, the Department recommends a TAC as a less restrictive and more effective tool for maintaining similar annual catches and business practices for fishermen harvesting sheep crab.

No other alternatives were identified by or brought to the attention of Commission staff that would have the same desired regulatory effect.

(b) No Change Alternative

The recent increase in landings of king crab and box crab with little to no management measures in place for these species is potentially damaging to the resource. Limits on incidental take of other non-Cancer crabs are important to prevent future uncontrolled take with insufficient management measures and limited information on these species.

V. Mitigation Measures Required by Regulatory Action:

The proposed regulatory action is expected to have no negative impact on the environment; therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action:

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made:

(a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with

Businesses in Other States:

The proposed action will not have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states because the regulatory action will not increase compliance costs and will not substantially affect incidental take quantities.

- (b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:

The Commission does not anticipate significant impacts on the creation or elimination of jobs within the state, or the creation of new businesses or the elimination of existing businesses or the expansion of businesses because the proposed action will not significantly increase or reduce incidental take quantities for non-Cancer crab.

The Commission anticipates benefits to the environment in the sustainable management of non-Cancer crab species.

The Commission does not anticipate any benefits to the health and welfare of California residents, or to worker safety.

- (c) Cost Impacts on a Representative Private Person or Business:

The proposed regulations may have adverse cost impacts to king and box crab harvest revenue for a few fishermen who have historically landed more than the proposed 25-pound limit

- (d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State: None.

- (e) Nondiscretionary Costs/Savings to Local Agencies: None.

- (f) Programs Mandated on Local Agencies or School Districts: None.

- (g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code: None.

- (h) Effect on Housing Costs: None.

## VII. Economic Impact Assessment:

For background, the commercial Dungeness crab and spiny lobster fisheries account for among the highest ex-vessel values in the state, together constituting over \$72.3 million on average for the last three years. Of the over 700 targeted fisheries permit holders for rock crab, lobster, and Dungeness crab, an average of 76 fishermen over the last ten years have been active in the incidental take of non-Cancer crab species. Of those 76 landing non-Cancer crab, a relatively stable average of 64 fishermen were landing sheep crab. In contrast, the number of fishermen landing king and especially box crab has grown from a ten-year average of 12 to the five-year average of 17 fishermen. The substantial increase in king and box crab landings has been accompanied by an interest among fishermen in their development as target fisheries.

Consideration of the management of these non-Cancer crab species has prompted the proposed possession and landing limits for box and king crabs and a TAC limit for sheep crab, the non-Cancer crab with the highest harvest quantities. The impact of the 95,000 pounds TAC for sheep crab is anticipated to be minimal as the limits fall well within the historical harvest quantities. (More detail on the TAC rationale is available in section III. Description of Regulatory Action.)

A relatively low 25-pound possession and landing limit for box and king crab is proposed while the feasibility of a target fishery is evaluated through an EGP program. The introduction of a 25-pound possession and landing limit for box and king crab may substantially reduce landings for some fishermen.

According to landing receipt data, commercial fishermen landed a five-year average (2013-17) of 104,635 pounds of all non-Cancer crab species with an ex-vessel value of \$189,448. Sheep crab landings, which during this time averaged about 66 percent of the total value, are not anticipated to drop in aggregate value with the proposed TAC limit. The other non-Cancer crab species have grown in the share of catch, especially since the 2017 spike in participation. The proposed 25-pound incidental catch limit is anticipated to bring the king and box crab aggregate ex-vessel landing values down to represent historic levels of incidental take in the target fisheries (see Figure 2. Non-Cancer crab landings by species, on p.3).

For a baseline, the economic impact of the five-year average catch by each non-Cancer crab species is shown in Table 1. Over this 5-year period, non-Cancer crab has contributed annually about \$381,036 in total economic output (direct, indirect, and induced impacts) to the state economy. The harvest of non-Cancer crab species has also contributed about \$65,313 in employee compensation, supporting about 1.6 jobs.

Table 1. Average Annual Economic Impact of Non-Cancer Crab Landings (2013-2017)

Non-Cancer Crab Species	Actual Ex-Vessel Value	Non-Cancer Crab Employment	Employee Compensation	Total Economic Output
Sheep Crab	\$ 109,104	0.9	\$ 37,615	\$ 219,442
Box Crab	\$ 70,152	0.6	\$ 24,185	\$ 141,096
CA King Crab	\$ 10,191	0.1	\$ 3,514	\$ 20,498
CA State Non-Cancer Crab Total	\$ 189,448	1.6	\$ 65,313	\$ 381,036

The proposed sheep crab TAC is estimated to have little change on sheep crab harvest values. However, box and king crab declines are anticipated with the proposed 25-pound possession and landing limits, which could result in an estimated market-wide \$64,425 drop in ex-vessel value for box crab and a \$6,652 drop for king crab as shown in Table 2.

Table 2. Estimated Ex-Vessel Values for Box and King Crab with the Proposed 25-Pound Possession and Landing Limits.

Historical Ex-Vessel Values			Estimated Ex-Vessel Values with Proposed 25 lb Limit	
Year	Box Crab	King Crab	Box	King
2013	\$ 9,404	\$ 3,045	\$ 1,055	\$ 1,139
2014	\$ 26,787	\$ 995	\$ 2,152	\$ 533
2015	\$ 30,606	\$ 4,013	\$ 4,095	\$ 1,240
2016	\$ 92,818	\$ 15,577	\$ 5,425	\$ 6,004
2017	\$ 191,145	\$ 27,327	\$ 15,907	\$ 8,780
5-Year Average	\$ 70,152	\$ 10,191	\$ 5,727	\$ 3,539
Difference with proposed regulatory action			\$ (64,425)	\$ (6,652)

The estimated ex-vessel values with the proposed 25-pound limit are derived from actual historical landings data. The annual ex-vessel value for each year was adjusted by reducing the value from individual landings that exceeded 25 pounds.

In the absence of this harvest value circulating throughout the economy, total

economic output could decline by about \$142,958, which could reduce support for about 0.6 jobs. However, the total economic output estimates are derived with a static linear model that does not include adaptation to change.

Notably, an experimental gear permit (EGP) is being developed concurrently with this rulemaking. The EGP will explore the feasibility of a targeted fishery for box crab in which participating fishermen would not be subject to the 25-pound limit. As fishermen adapt to the new regulations, some may feel 25 pounds is not worth pursuing. Those with permits to target box crab through the EGP could have access to higher harvest quantities under the proposed program, potentially resulting in an increase in total landings beyond those seen in 2017. Catch limits during the EGP program will be adaptive to research findings. If the EGP is successful, the overall ex-vessel value for box crab may actually increase under this program and if findings lead to a recommendation of development of a new fishery, access to box crab permits may become more broadly available.

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State:

The Commission anticipates minimal negative impacts on the creation or elimination of jobs within the state because the proposed action is not likely to have substantial widespread reductions in incidental take quantities for king and box crab species, and sheep crab incidental take is anticipated to be relatively unchanged.

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State:

The Commission anticipates no significant impacts on the creation of new businesses or the elimination of existing businesses within the state because the proposed action is not likely to substantially change incidental take quantities enough to stimulate the creation or elimination of businesses.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State:

The Commission anticipates no significant impacts on the expansion of businesses within the state because the proposed action is not likely to substantially change incidental take quantities.

(d) Benefits of the Regulation to the Health and Welfare of California Residents:

The Commission does not anticipate any benefits to the health and welfare of California residents.

(e) Benefits of the Regulation to Worker Safety:

The Commission does not anticipate any impacts worker safety.

(f) Benefits of the Regulation to the State's Environment:

The Commission anticipates benefits to the State's environment. The proposed regulation benefits the environment by prohibiting the overexploitation of several non-Cancer crab species before adequate management measures could be developed for dedicated targeted fisheries. The proposed regulation will also allow for development of an experimental gear permit program for box and king crab designed to conduct research on species biology and potential appropriate management measures.

## **Informative Digest/Policy Statement Overview**

### **Summary of the Proposed Amendments**

Under current law, commercial fishermen, with a Dungeness crab, rock crab or lobster permit, may incidentally take unlimited amounts of crabs not of the genus *Cancer* (non-Cancer crabs) when targeting Dungeness crab, rock crab, and lobster, with no limit on amount. Laws that specifically allow the incidental take of crab include subdivision 8284(c), Fish and Game Code (FGC), and subsection 125.1(c), Title 14, California Code of Regulations (CCR), which allow the take of non-Cancer crabs when targeting rock crab. Similarly, non-Cancer crabs may be taken incidentally in the lobster (subdivision 8250.5(b), FGC) and Dungeness crab (subdivision 8284(a), FGC) fisheries. The FGC provides a general definition of bycatch (incidental take) that does not give guidance on acceptable amounts (Section 90.5, FGC), but FGC and CCR sections on specific species and gear types do specify rules for retaining non-target species in some cases.

The proposed changes would amend the existing Section 126, which currently applies to the commercial take of Tanner crab. The title of 126 would be changed to “Commercial Take of Crabs not in the Genus *Cancer* in Trap Gear.” Tanner crab (*Chioneocetes* spp.) are non-Cancer crabs, and existing regulations regarding this fishery would be shifted to new Section 126.1. The new Section 126 would provide a definition of crabs of the genus *Cancer* and institute limits to allowable incidental take of non-Cancer crabs when participating in other target invertebrate trap fisheries. Species in the family Lithodidae (box and king crabs) would be subject to a 25-pound possession and landing limit, while the sheep (spider) crab would be subject to a total allowable catch of 95,000 pounds. When possessing or landing species in the Lithodidae family, an equal or greater amount of the target species (rock crab, lobster, or Dungeness crab) must also be possessed or landed. Additionally, a requirement to bring non-Cancer crab, in the whole, ashore to be recorded on a landing receipt would be added.

The proposed regulatory change would amend subsection 125.1(c)(3), which details allowances for incidental take of other species when targeting rock crab. The incidental allowances would remain unchanged except for reference to the new subsection 126(b) specifying a limit on non-Cancer crabs.

### **Benefit of the Regulation**

The proposed regulation will benefit the environment in the sustainable management of non-Cancer crab species by prohibiting the overexploitation of several non-Cancer crab species before adequate management measures could be developed for dedicated targeted fisheries. The proposed regulation will also allow for development of an experimental gear permit program for box and king crab designed to conduct research on species biology and potential appropriate management measures.

The proposed regulations are neither inconsistent nor incompatible with existing State regulations. Statutes and regulations specifically allow the incidental take of crab other

than the genus *Cancer* in commercial fisheries for rock crab (subdivision 8284(c), FGC, and subsection 125.1(c), Title 14, CCR), spiny lobster (subdivision 8250.5(b), FGC), and Dungeness crab (subdivision 8284(a), FGC). The Legislature has delegated authority to the Commission to regulate fisheries that the Director of the California Department of Fish and Wildlife determines are emerging fisheries (Fish and Game Code, Section 7090) as well as the power to regulate the commercial spiny lobster and rock crab trap fisheries (Fish and Game Code Section 8254 and 8282).



## Regulatory Language

**Section 125.1, Title 14, CCR, is amended to read:**

### **§ 125.1 Commercial Take of Rock Crab; Size Limit; Use of Rock Crab as Bait; Incidental Take Provisions**

*... [No changes to subsections (a)-(b)]*

(c) Incidental take. Only the following species may be taken incidentally in rock crab traps being used to take rock crab under authority of a permit issued pursuant to Section 125. All other invertebrates and finfish shall be immediately released to the water.

(1) Kellet's whelk.

(2) Octopus.

(3) Crabs, other than the genus *Cancer*, subject to limits provided in subsection 126 (b).

*... [No changes to subsection (d)]*

Note: Authority cited: Section 8282, Fish and Game Code.

Reference: Sections 8043, 8047, 8250.5, 8275, 8281, 8284, 9001.7 and 9011, Fish and Game Code.

**Section 126, Title 14, CCR, is amended to read and add Section 126.1:**

### **§ 126. Commercial Take of Crabs not in the Genus *Cancer* in Trap Gear.**

(a) For the purpose of this section, crabs in the genus *Cancer* include Dungeness and rock crab as defined in Fish and Game Code subdivisions 8275(a) and (c).

(b) Incidental take of crabs not listed in subsection (a) is allowed in rock crab, Dungeness crab, and California spiny lobster trap fisheries as follows:

(1) No more than 25 pounds of each crab species in the Lithodidae family (box crab and king crab) may be possessed onboard a vessel, retained or landed at any time. The amount of Lithodidae species possessed onboard a vessel, retained or landed shall not exceed the amount of rock crab, spiny lobster, or Dungeness crab that are legally possessed onboard the vessel, retained or landed at any time.

(2) Crabs in the genus *Chionecetes* (Tanner crab) may not be taken except under the authority of a Tanner Crab Trap Vessel Permit.

(3) The total allowable catch of sheep crab (spider crab, *Loxorhynchus grandis*) is 95,000 pounds landed during a calendar year. The department will close the fishery at the time that the catch limit is reached, or is projected to be reached, prior to the end of the calendar year. The department shall give no less than 10 days notice to any individual who has landed sheep crab within the previous five years and post notice of closure on the department's website. The department shall give the public and the commission no less than 10 days notice of the closure via a department news release.

(c) Pursuant to Fish and Game Code Section 9001.7, crabs not in the genus Cancer may be used as bait in finfish traps. All crab shall be brought ashore and accounted for on a landing receipt pursuant to Fish and Game Code Sections 8043 and 8047 prior to being used as bait as follows:

(1) The total pounds of each species to be used as bait from each landing shall be recorded by writing the species common name and pounds within the rows provided and noting "bait use" in the space for price.

(2) Crab used as bait in finfish traps shall be documented on board the vessel by a copy of the landing receipt pursuant to Fish and Game Code Sections 8043 and 8047 demonstrating that the crab to be used as bait has been landed prior to being used as bait. Copies of all landing receipts which document the catch of crabs that are used as bait shall be kept onboard the fishing vessel for a minimum period of 30 calendar days from the date of landing as listed on the landing receipt.

Note: Authority Cited: Section 7090, Fish and Game Code.

Reference: Section 7090, Fish and Game Code.

## **§ ~~426~~126.1 Commercial Take of Tanner Crab**

*... [No changes to subsections (a)-(f)]*

Note: Authority cited: Sections 713, 1050, 5508, 7090, 7857, 8026 and 8282, Fish and Game Code.

Reference: Sections 1050, 1052, 5508, 7050, 7051, 7055, 7056, 7058, 7850, 7857, 7881, 8026, 8031, 8040, 8041, 8042, 8043, 8046, 8051, 8250.5, 8282, 8284, 8834, 9000, 9001, 9002, 9003, 9004, 9005, 9006, 9007, 9008 and 9011, Fish and Game Code.

**Notice of Exemption****Appendix E**

**To:** Office of Planning and Research  
P.O. Box 3044, Room 113  
Sacramento, CA 95812-3044

County Clerk

County of: N/A

**From:** (Public Agency): CA Fish and Game Commission  
1416 Ninth Street, Suite 1320  
Sacramento, CA 95814

(Address)

Project Title: Specifying Incidental Take Allowances for Crabs other than the Genus Cancer

Project Applicant: California Department of Fish and Wildlife

Project Location - Specific:  
Statewide

Project Location - City: N/A

Project Location - County: N/A

Description of Nature, Purpose and Beneficiaries of Project:

The proposed project would restrict the incidental take of non-Cancer crabs in the commercial invertebrate trap fisheries. In particular, it would establish a trip limit for king crab and box crab, an annual total allowable catch for sheep crab, and a reporting requirement for the incidental take of non-Cancer crabs.

Name of Public Agency Approving Project: California Fish and Game Commission

Name of Person or Agency Carrying Out Project: California Department of Fish and Wildlife

Exempt Status: **(check one):**

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: Cat 7 & 8; 14 CCR 15307 & 15308
- ☐ Statutory Exemptions. State code number: \_\_\_\_\_

Reasons why project is exempt:

The proposed project would reduce the risk of overexploiting non-Cancer crabs and promote sustainable fisheries for these species.

Lead Agency  
Contact Person: Melissa Miller-Henson Area Code/Telephone/Extension: (916) 653-4899

**If filed by applicant:**

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☐ Yes ☐ No

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Title: Acting Executive Director

☒ Signed by Lead Agency ☐ Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.  
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR: \_\_\_\_\_

October 17, 2018

**ATTACHMENT TO NOTICE OF EXEMPTION**  
**Specifying Incidental Take Allowances for Crabs other than the Genus Cancer**

The California Fish and Game Commission (Commission) has taken final action under the Fish and Game Code and the Administrative Procedure Act with respect to the proposed rulemaking on October 17, 2018. On June 20, 2018, the Commission authorized notice of its intent to amend subsections 125.1(c)(3) and 126, Title 14, California Code of Regulations (CCR) and add new Section 126.1, to establish restrictions on incidental non-Cancer crab take in invertebrate trap fisheries. The Commission then held a discussion hearing on August 22, 2018, and adopted the proposed rulemaking on October 17, 2018.

**Categorical Exemptions to Protect Natural Resources**

In compliance with the California Environmental Quality Act (CEQA; Public Resources Code Section 21000 et seq.), the Commission adopted regulations pertaining to the incidental take of crabs not in the genus *Cancer* (non-Cancer crab) relying on the categorical exemptions contained in CEQA Guidelines Sections 15307 (Action by Regulatory Agencies for Protection of Natural Resources). The exemption applies to agency actions to protect natural resources.

In recent years, the California Department of Fish and Wildlife (Department) has documented increasing landings of non-Cancer crab, which may be harvested incidentally to other target invertebrate trap fisheries. As prescribed by the Marine Life Management Act (Sections 7050 et seq., Fish and Game Code), the Department is obligated to sustainably manage the state's living marine resources. Therefore, as the landings of incidentally caught species rise to become emerging fisheries, the Department is obligated to collect the necessary information and recommend appropriate regulations to the Commission (Section 7090, Fish and Game Code). Thus, proposed precautionary catch limits for all non-Cancer crab species was adopted to reduce the risk of overexploitation while subsequent research to inform appropriate future management measures can be conducted as resources allow and prioritized by degree of conservation or management concern.

The above-described action is undertaken to ensure the sustainability of the species and fisheries and reduce the risk of environmental impacts from a potentially unrestricted fishery. The Commission has determined that there are neither significant cumulative impacts of successive projects of the same type in the same place, nor is there a reasonable possibility the proposed action will have a significant effect on the environment due to unusual circumstances. Accordingly, the Commission concludes that the proposed action is properly subject to the CEQA Class 7 categorical exemption.

# Commercial Non-Cancer Crab Incidental Landing Limits



CDFW

**Dr. Julia Coates, Marine Region, Environmental Scientist**  
**Fish & Game Commission Meeting, Fresno, October 17, 2018**



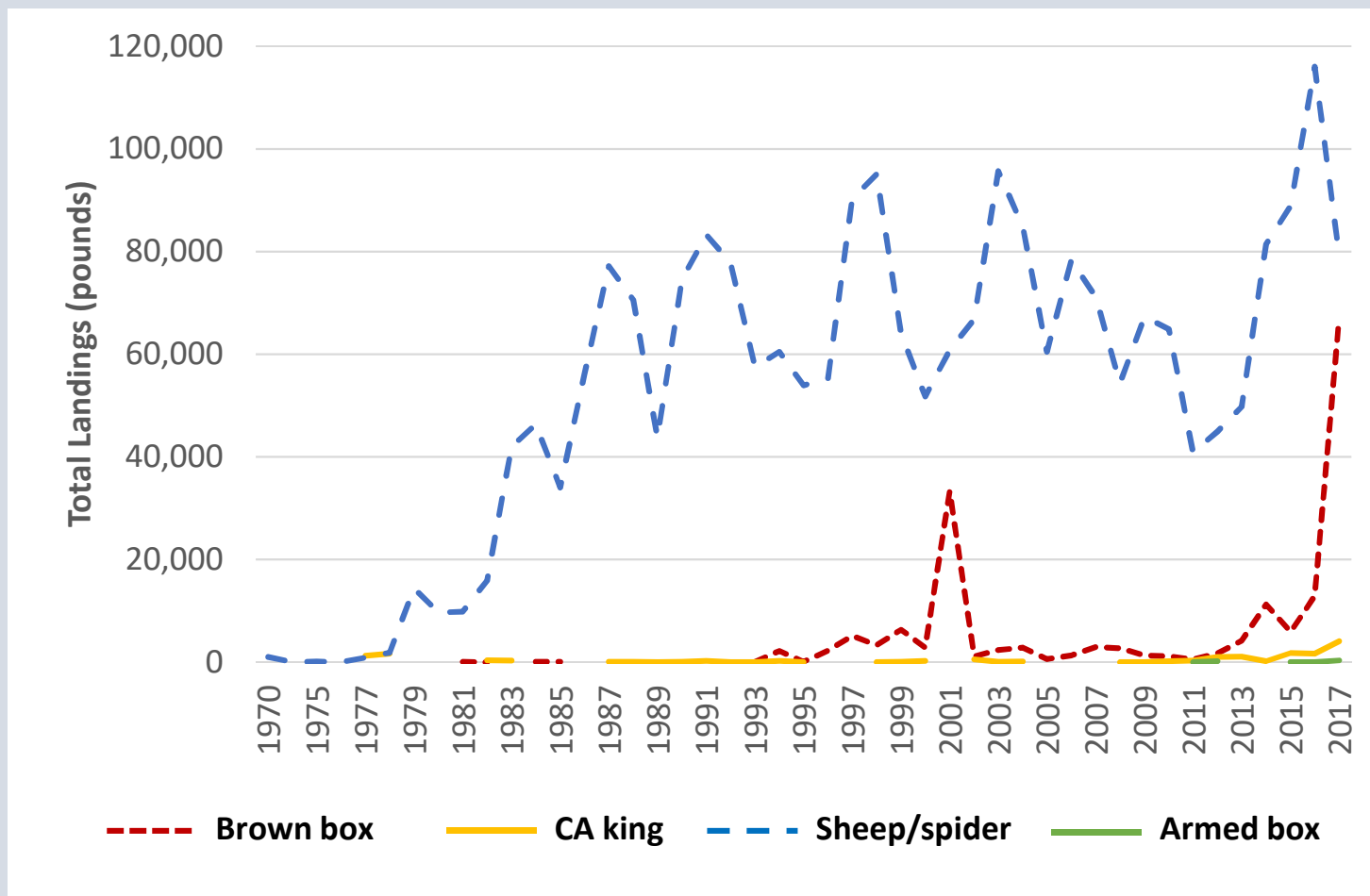
# Issue history

- Landings increases began 2014
- Experimental gear permit requests began June 2017
- Marine Resource Committee discussion November 2017
- Commission directed Department to develop rulemaking package December 2017
- Survey and constituent meeting April 2018
- Notice hearing June 2018



CDFW

# Landings by species in traps



# Regulatory status

- Incidental take of non-Cancer crabs expressly permitted
  - Dungeness
  - Rock crab
  - Lobster
- No limit on amount by trap





# Management approach

- CDFW Director emerging fishery designation submitted to Commission April 2018
- Recommend limits on incidental take in invertebrate trap fisheries
  - Precautionary limits on box and king species
  - Status quo on sheep/spider crab
- Experimental gear permit research program for box crab



Derek Stein, CDFW

# Proposed new rules

- Family Lithodidae (box and king)
  - Possession and landing limit 25 pounds
- Sheep/spider crab
  - Total allowable catch 95,000 pounds
- Requirement to land crab before use as bait
- New section 126 for non-Cancer crabs in traps



Derek Stein, CDFW



# Summary

- Consider adoption today
  - Precautionary limits on box and king species
  - Approximate status quo on sheep/spider crab
  - Requirement to land crabs prior to use as bait
- Experimental gear permits to assess appropriate harvest levels and potential future regulations changes
- [Julia.Coates@wildlife.ca.gov](mailto:Julia.Coates@wildlife.ca.gov)  
805-730-1328



CDFW



2018 JUL 30 PM 1:30

## Memorandum

Date: July 26, 2018

To: Valerie Termini  
Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director

A handwritten signature in blue ink, appearing to read "C. Bonham", written over the printed name.

**Subject: Agenda Item for the August 22-23, 2018 Fish and Game Commission Meeting re: Recreational and Commercial Fishing Regulations for Federal Groundfish and Associated Species for Consistency with Federal Rules for 2019 and 2020**

At its June 7-12, 2018 meeting, the Pacific Fishery Management Council recommended changes to annual catch limits and recreational fishing regulations for federally managed groundfish species for the 2019-2020 management cycle. In addition, attainment of commercial harvest limits for cabezon and greenling have been low and trip limits need to be adjusted accordingly.

In order to have conforming State regulations in place before fishing begins in 2019, the Department of Fish and Wildlife (Department) requests the Fish and Game Commission authorize publication of notice of its intent to consider amendment of its recreational and commercial fishing regulations for federally managed groundfish species at its August 22-23, 2018 meeting.

The Department's Initial Statement of Reasons is attached, which proposes regulatory changes needed to align state regulations with the range of federal regulations expected to be in effect for 2019 and 2020 and to increase fishing opportunity while staying within harvest limits. The changes result in modifications to recreational season lengths, depth restrictions, and bag limits for federally managed groundfish and state-managed species, which associate with federal groundfish. The changes also result in modifications to Total Allowable Catch levels as well as increases to commercial trip limits for cabezon and greenling.

If you have any questions or need additional information, please contact Dr. Craig Shuman, Regional Manager of the Marine Region, at (916) 445-6459. The public notice should identify Environmental Scientist, Laura Ryley as the Department's point of contact for this rulemaking. Ms. Ryley can be reached at (831) 649-7142 or at [Laura.Ryley@wildlife.ca.gov](mailto:Laura.Ryley@wildlife.ca.gov).

Valerie Termini, Executive Director  
Fish and Game Commission  
July 20, 2018  
Page 2

Attachment

cc: Stafford Lehr, Deputy Director  
Wildlife and Fisheries Division  
[Stafford.Lehr@wildlife.ca.gov](mailto:Stafford.Lehr@wildlife.ca.gov)

Craig Shuman, D. Env.  
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Karen Mitchell  
Senior Environmental Scientist  
Regulations Unit  
Wildlife and Fisheries Division  
[Karen.Mitchell@wildlife.ca.gov](mailto:Karen.Mitchell@wildlife.ca.gov)

STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION  
(Pre-publication of Notice Statement)

Amend Sections 27.30,  
27.35, 27.40, 27.45, 27.50, 28.27, 28.55, 52.10 and 150.16  
Title 14, California Code of Regulations

Re: Recreational and Commercial Fishing Regulations for Federal Groundfish and Associated  
Species for Consistency with Federal Rules for 2019 and 2020

- I. Date of Initial Statement of Reasons: June 18, 2018
- II. Dates and Locations of Scheduled Hearings:
- (a) Notice Hearing: Date: August 22, 2018  
Location: Fortuna, CA
  - (b) Discussion Hearing Date: October 17, 2018  
Location: Fresno, CA
  - (c) Adoption Hearing: Date: December 12, 2018  
Location: Oceanside, CA
- III. Description of Regulatory Action:
- (a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

Biennially, the Pacific Fishery Management Council (PFMC) reviews the status of west coast groundfish populations. As part of that process, it recommends groundfish fisheries harvest limits and regulations aimed at meeting biological and fishery allocation goals specified in law or established in the Pacific Coast Groundfish Fishery Management Plan (FGFMP). These recommendations coordinate west coast management of recreational and commercial groundfish fisheries in the Exclusive Economic Zone (EEZ) (three to 200 miles offshore) off Washington, Oregon and California. These recommendations are subsequently implemented as federal fishing regulations by the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries).

Under California law (California Fish and Game Code sections 200, 205, 7071, and 8587.1), the California Fish and Game Commission (Commission) adopts and/or automatically conforms regulations for the recreational and nearshore commercial groundfish fisheries in State waters zero to three miles from shore. Regulatory authority for most nearshore stocks is shared jointly between State and federal governments under the FGFMP and the Nearshore Fishery Management Plan (NFMP). Management of federal groundfish and associated species is based on PFMC-established federal annual catch limits (ACL); in the NFMP these state management limits are called total allowable catch (TAC). ACLs and TACs serve the same purpose of setting a limit on catch. Federal regulations establish management measures for most

nearshore stocks, but defer to State rules on commercial trip limits for cabezon and greenling.

Title 14 regulations specify statewide TACs and commercial trip limits for cabezon and greenlings of the genus *Hexagrammos* (Sections 52.10, 150.16). Until recently, TACs specified in Title 14 have been lower than the ACLs established in federal regulations. Starting in 2019, the federal ACL for cabezon will be lower than the State TAC creating an inconsistency between State and federally established harvest limits.

The California Department of Fish and Wildlife (Department) actively manages cabezon and greenlings to stay within the TAC and recreational and commercial allocations. Although recent attainment of commercial allocations for cabezon and greenling have been low, trip limits have not been adjusted accordingly. Trip limit increases will benefit businesses that rely on commercial groundfish fishing.

It is important to have consistent State and federal regulations establishing harvest limits, season dates, depth constraints and other management measures, and also important that the State and federal regulations be effective concurrently. Consistency of rules in adjacent waters allows for uniformity of enforcement, minimizes confusion which promotes compliance, and allows for a comprehensive approach to resource management. Consistency with federal regulations is also necessary to maintain State authority over its recreational groundfish fishery and avoid federal preemption under the Magnuson-Stevens Fishery Conservation and Management Act [16 USC §1856 (b)(1)].

On June 12, 2018, the PFMC recommended changes for annual catch limits and recreational groundfish fishing in California for 2019 and 2020, which are expected to go into effect on or around January 1, 2019.

## **Present Regulations**

### **Recreational**

Existing law authorizes the recreational take of groundfish subject to regulations set forth by federal and State authorities. Current regulations establish season lengths, depth constraints, methods of take, as well as size, bag and possession limits within the five groundfish management areas for all federal groundfish and associated species [sections 27.20, 27.25, 27.30, 27.35, 27.40, 27.45, 27.50, 27.51, 28.26, 28.27, 28.28, 28.29, 28.48, 28.49, 28.54, 28.55, and 28.56 Title 14, CCR].

### ***Species or Species Groups Which May be Taken or Possessed***

Present regulations allow anglers to take and possess federally-managed groundfish species as defined in Section 1.91 when the fishing season is open. Regulations also establish that California sheephead, ocean whitefish, and all greenlings of the genus *Hexagrammos*, which are State-managed species known to associate with federal groundfish, can be taken and possessed only when the season is open to recreational groundfish fishing.

### ***Season Length and Depth Constraints***

Current regulations specify seasons and depth constraints for the five groundfish management areas in ocean waters off California. These regulations serve as management tools that are adjusted biennially to ensure that mortality of both

overfished and non-overfished stocks remain within allowable limits. The current seasons and depth constraints were designed to maximize harvest of healthy stocks while staying within allowable limits for overfished species.

The Northern and Mendocino Management Areas have an eight month season with a depth constraint of 30 fathoms and 20 fathoms (respectively) from May to October and no depth constraint during November and December. The San Francisco Management Area has an eight and a half month season, with a depth constraint of 40 fathoms. The Central Management Area has a nine month season, with a depth constraint of 50 fathoms. The Southern Management Area has the least restrictive regulations, with a 10 month season and a depth constraint of 60 fathoms. The Cowcod Conservation Areas provide discrete depth limits within the Southern Management Area.

#### *Bag Limits*

Present regulations establish bag limits which vary by species or species groups and are designed to keep harvest within allowable limits.

#### Commercial

Current regulations establish total allowable catches, allocations, and trip limits for federal groundfish and associated species [sections 52.10, 150.16, Title 14, CCR].

#### *Total Allowable Catch and Allocations*

Current state regulations describe TACs for California sheephead, cabezon, and greenling. TACs include a precautionary reduction to reflect uncertainty about the status of each stock when the NFMP was adopted, which was consistent with PFMC actions at that time for nearshore rockfish. The PFMC has since amended its framework for setting harvest limits to meet new requirements of the Magnuson-Stevens Fishery Conservation and Management Act and to be consistent with National Standard guidelines. The revised guidelines introduced and/or defined new fishery management concepts that are designed to better account for scientific and management uncertainty and to prevent overfishing which now makes additional precautionary reductions to federal ACLs redundant and unnecessary.

#### *Trip Limits*

Current regulations establish cumulative two-month trip limits for cabezon and greenlings statewide. Cumulative trip limits for cabezon range from 100 pounds to 500 pounds per two-months; greenling ranges from 150 pounds to 200 pounds. Trip limits were designed to spread allowable catches through the open season to the extent possible to prevent early attainment of annual limits.

#### **Proposed Regulations**

The Department is proposing the following regulatory changes to be consistent with PFMC recommendations for federal groundfish regulations in 2019 and 2020. Other changes are proposed to increase commercial trip limits for cabezon and greenling and simplify regulations.

This approach will allow the Commission to adopt State recreational groundfish regulations to timely conform to those taking effect in federal ocean waters in January 2019.



### Recreational

The proposed regulatory changes increase the season length in the San Francisco Management Area by two weeks as a result of increases in allowable take of yelloweye rockfish (Figure 1). This would align the season start dates for the San Francisco and Central Management Areas.

The latest rebuilding analysis for yelloweye rockfish, completed in December 2017, indicated the stock is rebuilding 47 years faster than estimated in 2011. Due to the estimated acceleration in the rebuilding progress of the stock, harvest limits have increased. The proposed change in San Francisco Management Area season length is not expected to have any effect on the rebuilding process of this stock or the time needed to rebuild.

The California scorpionfish season length is proposed to increase in four of the five management areas (Mendocino, San Francisco, Central, and Southern) as a result of changes in allowable take of California scorpionfish.

Total mortality of California scorpionfish has been below the annual catch limit in recent years. In addition, the most recent stock assessment indicated that California scorpionfish is healthy and the harvest limit doubled compared to previous years. This optimistic outlook on stock status coupled with lower mortality in recent years suggests that the length of the California scorpionfish season can be increased by removing the September 1 to December 31 closure in the Mendocino, San Francisco, Central, and Southern Management Areas.

The depth restrictions in the Southern Management Area and the Cowcod Conservation Area (CCA) are proposed to be changed from 60 to 75 fathoms and 20 to 40 fathoms, respectively (Figure 1) as a result of changes in allowable take levels.

Cowcod was last assessed in 2013. At that time, it was rebuilding much quicker than anticipated and is expected to be rebuilt by 2020. Recent mortality has been far below annual catch limits and the harvest limit was increased compared to previous years. The proposed changes to depth restrictions in the Southern Management Area and CCA are not expected to have any effect on the rebuilding progress of this stock or the time needed to rebuild.

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 1 – Oct 31 <30fm						All Depth	
Mendocino	Closed				May 1 – Oct 31 <20fm						All Depth	
San Francisco	Closed			Apr 1 – Dec 31 <40 fm								
Central	Closed			Apr 1 – Dec 31 <50 fm								
Southern	Closed		Mar 1 – Dec 31 <75 fm									
CCA	Closed		Mar 1 – Dec 31 <40 fm									

Figure 1. California recreational groundfish season structure in 2019 and 2020 as recommended by the PFMC in June 2018.

The proposed regulations increase the bag limit for canary rockfish from one fish to two fish in all management areas. The proposed increase can be accommodated within the

harvest guideline.

The proposed regulations decrease the bag limit for lingcod from two to one fish in the Mendocino, San Francisco, Central, and Southern Management Areas. A lower bag limit is needed to keep catches within allowable limits.

#### Commercial

The proposed regulatory changes eliminate numerical values for cabezon and greenling TACs. Although federal ACLs have changed over time, TACs have not been updated accordingly. Given that the numerical values no longer reflect best available information, and in some instances are more liberal than federal ACLs, referencing ACLs in federal regulation is appropriate.

The proposed changes also eliminate references to recreational and commercial allocations from Section 52.10. These numerical values are redundant and duplicative of allocations described in Section 52.05(d), Title 14. Removing references to numerical values for TACs and allocations from Section 52.10 will decrease workload for future rulemakings that arise from changes to federal ACLs.

The proposed regulations also increase commercial trip limits for cabezon and greenling (Figure 2). Both stocks have been under-harvested in recent years. Offering a modest increase can be accommodated under federal harvest limits, will set the limits the same for each two month period for consistency, and will uphold the Department's obligation under the NFMP.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cabezon	500 lb/ 2 months		500 lb/ 2 months		500 lb/ 2 months		500 lb/ 2 months		500 lb/ 2 months		500 lb/ 2 months	
Greenling	250 lb/ 2 months		250 lb/ 2 months		250 lb/ 2 months		250 lb/ 2 months		250 lb/ 2 months		250 lb/ 2 months	

Figure 2. Proposed commercial trip limits in pounds per individual two month period for cabezon and greenling statewide.

#### Update to Authority and Reference Citations Based on Recent Legislation

Senate Bill 1473 (Stats. 2016, Ch. 546) made organizational changes to the Fish and Game Code that became effective January 1, 2017. The changes included moving the Commission's exemptions from specified Administrative Procedure Act time frames from Section 202 to Section 265 of the Fish and Game Code, and moving the Commission's effective period procedures from Section 220 to Section 275 of the Fish and Game Code. In accordance with these changes to the Fish and Game Code, sections 202 and 220 are removed from, and sections 265 and 275 are added to, the authority and reference citations for this rulemaking.

#### (b) Goals and Benefits of the Regulation:

It is the policy of this State to encourage the conservation, sustainable use, and where feasible, restoration of California's marine living resources for the benefit of all citizens of the State (Section 7050, Fish and Game Code). Benefits of the proposed continuation of the reasonable and sustainable management of groundfish resources and the protection of listed and special status species. Adoption of scientifically-based

seasons, depth restrictions, recreational bag limits, and commercial trip limits provide for the maintenance of sufficient populations of groundfish to ensure their continued existence.

(c) Authority and Reference Sections from Fish and Game Code for Regulation:

Authority: Sections 200, 205, 265, 275, 702, 7071 and 8587.1, Fish and Game Code.

Reference: Sections 200, 205, 240, 265, 275, 1802, 7071 and 8585.5, Fish and Game Code; Title 50, Code of Federal Regulations, Part 660, Subpart G.

(d) Specific Technology or Equipment Required by Regulatory Change: None.

(e) Identification of Reports or Documents Supporting Regulation Change:

Pacific Coast Groundfish Fishery 2019-2020 Harvest Specifications and Management Measures [https://www.pcouncil.org/wp-content/uploads/2018/06/E4\\_Supp\\_REVISEDAtt2\\_2019-20\\_GFSpexEA\\_E-Only\\_June2018BB.pdf](https://www.pcouncil.org/wp-content/uploads/2018/06/E4_Supp_REVISEDAtt2_2019-20_GFSpexEA_E-Only_June2018BB.pdf)

Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery. August 2016. Pacific Fishery Management Council. [http://www.pcouncil.org/wp-content/uploads/2017/03/GF\\_FMP\\_FinalThruA27-Aug2016.pdf](http://www.pcouncil.org/wp-content/uploads/2017/03/GF_FMP_FinalThruA27-Aug2016.pdf)

Nearshore Fishery Management Plan. Adopted October 25, 2002. Department of Fish and Game. <http://www.dfg.ca.gov/marine/nfmp/index.asp>

(f) Public Discussions of Proposed Regulations Prior to Notice Publication:

Pacific Fishery Management Council meetings where the proposed regulations for the 2019 and 2020 recreational groundfish and associated species were discussed:

- September 11-18, 2017, Boise, ID
- November 14-20, 2017, Costa Mesa, CA
- March 8-14, 2018, Sonoma, CA
- April 5-11, 2018, Portland, OR
- June 7-13, 2018, Spokane, WA

IV. Description of Reasonable Alternatives to Regulatory Action:

(a) Alternatives to Regulation Change:

No alternatives were identified by or brought to the attention of Commission staff that would have the same desired regulatory effect.

(c) No Change Alternative:

Under the No Change Alternative, State law would be inconsistent with federal law. Inconsistency in regulations will create confusion among the public and may result in

laws that are difficult to enforce. Additional opportunity expected to come with the federal regulation changes effective in January 2019 would not be realized.

It is critical to have consistent State and federal regulations establishing harvest limits, season dates, depth constraints and other management measures, and also critical that the State and federal regulations be effective concurrently. Consistency with federal regulations is also necessary to maintain State authority over its recreational and nearshore commercial groundfish fishery and avoid federal preemption under the Magnuson-Stevens Fishery Conservation and Management Act [16 USC §1856 (b)(1)].

(c) Consideration of Alternatives:

In view of information currently possessed, no reasonable alternative considered would be more effective in carrying out the purpose for which the regulation is proposed, would be as effective and less burdensome to affected private persons than the proposed regulation, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

V. Mitigation Measures Required by Regulatory Action:

The proposed regulatory action will have no negative impact on the environment; therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action:

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made:

(a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

The proposed action will not have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states. The Department anticipates increased opportunities for the recreational and commercial groundfish fishery in 2019-2020 compared to 2018.

(b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:

The Commission does not anticipate any significant impacts on the creation or elimination of jobs, the creation of new business, the elimination of existing businesses or the expansion of businesses in California.

The Commission anticipates benefits to the health and welfare of California residents. Participation in sport fisheries opportunities fosters conservation through education and appreciation of California's wildlife.

The Commission does not anticipate any benefits to worker safety.

The Commission anticipates benefits to the environment by the sustainable management of California's sport and commercial fishing resources.

(c) Cost Impacts on a Representative Private Person or Business:

The agency is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

(d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State:

None

(e) Nondiscretionary Costs/Savings to Local Agencies:

None

(f) Programs Mandated on Local Agencies or School Districts:

None

(g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code:

None

(h) Effect on Housing Costs:

None

## VII. Economic Impact Assessment

### Recreational

Recreational groundfish fisheries are broadly sub-divided between private anglers and commercial passenger fishing vessels. The economic impact of regulatory changes for recreational fisheries may be estimated by tracking the resulting changes in fishing effort, angler trips and length of stay in the fishery areas. Distance traveled affects gas and other travel expenditures. Daytrips and overnight trips involve different levels of spending for gas, food, and accommodations at area businesses as well as different levels of sales tax impacts. Direct expenditures ripple through the economy, as receiving businesses buy intermediate goods from suppliers that then spend that revenue again. Business spending on wages is received by workers who then spend that income, some of which goes to local businesses. Recreational fisheries spending, thus multiplies throughout the economy with the indirect and induced effects of the initial direct expenditure.

The adoption of scientifically-based regulations provides for the maintenance of sufficient populations of groundfish to ensure their continued existence and future groundfish sport fishing opportunities that in turn support the fishery economy. In a 2015 Fisheries Economics

Report by NOAA Fisheries, all marine recreational anglers trip-related and equipment expenditures sum to approximately \$1.5 billion in California. Coupled with the indirect and induced effects of this \$1.5 billion direct revenue contribution, the total realized economic benefit to California is estimated at \$3.6 billion in total economic output annually. This corresponds with about \$800 million in total wages to Californians, which affects about 16,500 jobs in the State, annually. While the precise share of these expenditures attributed solely to groundfish anglers is not known, we do know that the groundfish fishery constitutes a large share of the State's recreational angler activity.

The proposed regulations will modify State recreational groundfish regulations to conform to federal rules. Currently, State regulations for groundfish provide for: season lengths, depth restrictions, size limits, bag limits, and retention allowances. In adopting these conforming regulations, the State relies on information provided in PFMC documents which includes analysis of impacts to California ([https://www.pcouncil.org/wp-content/uploads/2018/06/E4\\_Supp\\_REVISEDAtt2\\_2019-20\\_GFSpexEA\\_E-Only\\_June2018BB.pdf](https://www.pcouncil.org/wp-content/uploads/2018/06/E4_Supp_REVISEDAtt2_2019-20_GFSpexEA_E-Only_June2018BB.pdf)).

For public notice purposes to facilitate Commission discussion, the Department is proposing regulatory changes to encompass the range of federal groundfish regulations that are expected to be in effect for 2019 and 2020. The proposed regulatory changes increase the sub-bag limit for canary rockfish from one to two fish, and decrease the bag limit for lingcod south of 40° 10' N. latitude from two to one fish.

The proposed regulatory changes change the depth restrictions in the Southern Management Area from 60 to 75 fathoms and change the depth restriction in the western Cowcod Conservation Area (CCA) from 20 to 40 fathoms.

The proposed regulations increase the season length in the San Francisco Management Area by two weeks. In addition, proposed regulations increase the season length for California scorpionfish in four of the management areas (Mendocino, San Francisco, Central, and Southern) by removing the September 1 to December 31 closure.

The range of estimated impact on angler trips by management area and the percent increase from the status quo is presented in Table 1. The economic impacts may be close to status quo however; some increased revenues are expected, providing economic benefit to the greater community.

Table 1. Estimated Impact on Angler Trips by Management Area.

Management Area	Impact on Angler Trips	Percent Increase over Status Quo
Northern	Status Quo	Status Quo
Mendocino	Status Quo	Status Quo
San Francisco	Status Quo + 1,375 Trips	Increase of 2%
Central	Status Quo	Status Quo
Southern	Status Quo	Status Quo*

\*A 15 fathom increase in depth is being considered. Economic effects of this depth increase and the increase inside the Cowcod Conservation Area cannot be quantified.

Sport fishing business owners, boat owners, tackle store owners, boat manufacturers, vendors of food, bait, fuel and lodging, and others that provide goods or services to those that recreationally pursue groundfish off California may be positively affected to some degree from increases to business that may result under the range of proposed regulations. However, anticipated impacts may vary by geographic location. Additionally, economic impacts to these same businesses may result from a number of factors unrelated to the proposed changes to groundfish fishing regulations, including weather, fuel prices, and success rates in other marine recreational fisheries such as salmon and albacore.

### Commercial

The economic impact of regulatory changes for commercial fisheries may be estimated by tracking the resulting changes in fishing effort, amount landed, price paid per pound, and employment generated through the catch or processing of the fish. Fishing effort affects fuel, and other trip expenditures. Landings and price paid per pound affect employment and income. Direct expenditures related to commercial fishing as well as business spending on wages received by workers ripple through the economy, some of which goes to local businesses. Commercial fisheries spending, thus multiplies throughout the economy with the indirect and induced effects of the initial direct expenditure.

In a 2015 Fisheries Economics Report by NOAA Fisheries, about \$1.3 million in total commercial fishing landings revenue generated about \$750 million in sales throughout the state marine economy. The state marine economy includes several marine-related industries: commercial harvesters, seafood processors and dealers, seafood wholesalers and distributors, and retail seafood sales. Commercial fishing landings revenue also generates about \$300 million in total wages to Californians, which affects about 9,000 jobs in the State, annually. While the precise share of these expenditures attributed solely to nearshore groundfish fishermen is not known, the nearshore groundfish fishery plays an important role in the economy of several California communities.

The proposed regulations increase commercial trip limits for cabezon and greenling. Commercial fishing industry businesses and coastal communities may realize positive benefits from increased greenling and cabezon bimonthly trip limits and catches, and a decrease in regulatory discarding; however the extent of anticipated impacts are speculative. Economic impacts to these same businesses may result from a number of factors unrelated to the proposed changes to groundfish fishing regulations that are described in the recreational section above.

### Effects of the regulation on the creation or elimination of jobs within the State

The cumulative effects of the changes statewide are estimated to be neutral to job elimination and potentially positive to job creation in California. No significant changes in fishing effort and fishing expenditures to businesses are expected as a direct result of the proposed regulation changes.

### Effects of the regulation on the creation of new businesses or the elimination of existing businesses within the State

The cumulative effects of the changes statewide are expected to be neutral to business elimination and potentially positive to the creation of businesses in California. No significant

changes in fishing effort and recreational fishing expenditures to businesses are expected as a direct result of the proposed regulation changes.

#### Effects of the regulation on the expansion of businesses currently doing business within the State

The cumulative effects of the changes statewide are expected to be neutral to positive to the expansion of businesses currently doing business in California. No significant changes in fishing effort and recreational fishing expenditures to businesses are expected as a direct result of the proposed regulation changes.

#### Benefits of the regulation to the health and welfare of California residents

Providing increased fishing opportunities for groundfish encourages recreation, which can have a positive impact on the health and welfare of California residents. Groundfish taken in the sport and commercial fishery and later consumed may have positive human health benefits due to their concentration of omega III fatty acids.

#### Benefits of the regulation to worker safety

The proposed regulations are not anticipated to impact worker safety conditions.

#### Benefits of the regulation to the State's environment

It is the policy of this State to encourage the conservation, sustainable use, and where feasible, restoration of California's marine living resources for the benefit of all citizens of the State (Section 7050, Fish and Game Code). Benefits of the proposed management actions include increased fishing opportunity, along with the continuation of the reasonable and sustainable management of groundfish resources and the protection of listed and special status species. Adoption of scientifically-based seasons, depth restrictions, recreational bag limits, and commercial trip limits provide for the maintenance of sufficient populations of groundfish to ensure their continued existence.

#### Concurrence with Federal Law.

The PPMC reviews the status of groundfish regulations biennially. As part of that process, it recommends regulations aimed at meeting biological and fishery allocation goals specified in law or established in the Pacific Coast Groundfish Fishery Management Plan. These recommendations coordinate management of recreational and commercial groundfish in the EEZ (three to 200 miles offshore) off the coasts of Washington, Oregon, and California. These recommendations are subsequently implemented as ocean fishing regulations by NOAA Fisheries.

California's sport fishing regulations need to conform to, or be more restrictive than, federal regulations to ensure that biological and fishery allocation goals are not exceeded.



## **Informative Digest/Policy Statement Overview**

Biennially, the Pacific Fishery Management Council (PFMC) reviews the status of west coast groundfish populations. As part of that process, it recommends groundfish fisheries harvest limits and regulations aimed at meeting biological and fishery allocation goals specified in law or established in the Pacific Coast Groundfish Fishery Management Plan (FGFMP).

These recommendations coordinate west coast management of recreational and commercial groundfish fisheries in the Exclusive Economic Zone (EEZ) (three to 200 miles offshore) off Washington, Oregon and California. These recommendations are subsequently implemented as federal fishing regulations by the National Oceanic and Atmospheric Administration National Marine Fisheries Service NOAA Fisheries.

Regulatory authority for most nearshore stocks is shared jointly between State and federal governments. For consistency, the California Fish and Game Commission (Commission) routinely adopts regulations to bring State law into conformance with federal law for groundfish and other federally-managed species. Nearshore stocks are managed based on both PFMC-established federal annual catch limits (ACL), and Commission-established total allowable catch (TAC) values. ACLs and TACs serve the same purpose of setting a limit on catch.

Current regulations establish recreational season lengths, depth constraints, methods of take, and size, bag and possession limits within the five groundfish management areas for all federal groundfish and associated species.

Current State regulations also provide for a statewide TAC for cabezon and greenlings of the genus *Hexagrammos* along with allocation of these TACs between the recreational and commercial fishery sectors, and commercial trip limits for cabezon and greenling. Until recently, TACs specified in Title 14 have been lower than the ACLs established in federal regulations. Starting in 2019, the federal ACL for cabezon will be lower than the State TAC.

Modest increases to trip limits can be accommodated under federal ACLs since commercial cabezon and greenling landings have fallen below ACLs in recent years.

### **Summary of Proposed Amendments**

The Department of Fish and Wildlife (Department) is proposing the following regulatory changes to be consistent with PFMC recommendations for federal groundfish regulations in 2019 and 2020. This approach will allow the Commission to adopt State recreational groundfish regulations to timely conform to those taking effect in federal ocean waters in January 2019.

The proposed regulatory changes will implement the following changes:

1. Increase the allowable depth for the recreational groundfish fishery from 60 to 75 fathoms in the Southern Management Area and from 20 to 40 fathoms in the Cowcod Conservation Area;
2. Increase the recreational season length for groundfish in the San Francisco Management Area by two weeks;
3. Increase the recreational season length for California scorpionfish by removing the September 1 to December 31 closure in the Mendocino, San Francisco, Central and Southern Management Areas;
4. Increase the recreational bag limit for canary rockfish from one to two fish statewide;
5. Decrease the recreational bag limit for lingcod from two to one fish in Mendocino, San Francisco, Central, and Southern Management Areas;

6. Replace language referencing numerical values for cabezon and greenling total allowable catch limits with references to federal annual catch limits in federal regulation;
7. Eliminate language referencing allocation limits for cabezon and greenling from Section 52.10; and
8. Increase commercial trip limits to 500 pounds for cabezon and 250 pounds for greenling.

The benefits of the proposed regulations are consistency with federal law, sustainable management of groundfish resources and promotion of businesses that rely on recreational and commercial groundfish fishing.

The proposed regulations are neither inconsistent nor incompatible with existing State regulations. The Legislature has delegated authority to the Commission to adopt fishing regulations (Fish and Game Code, sections 200, 205 and 265). The proposed regulations are consistent with regulations for fishing in marine protected areas (Section 632, Title 14, CCR), with Nearshore Fishery Management Plan regulations (Sections 52.00 through 52.10, Title 14, CCR) and with general fishing regulations in Chapters 1 and 4 of Subdivision 1 of Division 1, Title 14, CCR. Commission staff has searched the California Code of Regulations and has found no other State regulations related to the take of groundfish.

#### Update to Authority and Reference Citations Based on Recent Legislation

Senate Bill 1473 (Stats. 2016, Ch. 546) made organizational changes to the Fish and Game Code that became effective January 1, 2017. The changes included moving the Commission's exemptions from specified Administrative Procedure Act time frames from Section 202 to Section 265 of the Fish and Game Code, and moving the Commission's effective period procedures from Section 220 to Section 275 of the Fish and Game Code. In accordance with these changes to the Fish and Game Code, sections 202 and 220 are removed from, and sections 265 and 275 are added to, the authority and reference citations for this rulemaking.

## Regulatory Language

### Amend Section 27.30, Title 14, CCR, as follows:

#### § 27.30. Mendocino Groundfish Management Area.

This Section applies to take and possession of federally-managed groundfish species as defined in Section 1.91, California sheephead, ocean whitefish, and all greenlings of the genus *Hexagrammos*. For specific definitions, applicability, and procedures, see sections 1.91 and 27.20. For size limits, possession limits, and other regulations that apply to individual species, see specific sections beginning with Section 27.60.

(a) The Mendocino Groundfish Management Area means ocean waters between 40° 00' N. lat. (near Cape Mendocino, Humboldt County) and 38° 57.50' N. lat. (at Point Arena, Mendocino County).

(b) Seasons and depth constraints ~~(except as provided in subsection (c) below)~~:

(1) January 1 through April 30: Closed.

(2) May 1 through October 31: Take of all species is prohibited seaward of 20 fathoms in depth as described by general depth contour lines along the mainland coast and along islands and offshore seamounts.

(3) November 1 through December 31: Open for all species with no depth restrictions.

~~(c) California scorpionfish.~~

~~(1) May 1 through August 31: Take is prohibited seaward of 20 fathoms in depth as described by general depth contour lines along the mainland coast and along islands and offshore seamounts.~~

~~(2) September 1 through December 31: Closed.~~

Note: Authority cited: Sections 200, 205, 265 and 702, Fish and Game Code.

Reference: Sections 200, 205, 265, 1802 and 7071, Fish and Game Code; 50 CFR Part 660, Subpart G.

### Amend Section 27.35, Title 14, CCR, as follows:

#### § 27.35. San Francisco Groundfish Management Area.

This Section applies to take and possession of federally-managed groundfish species as defined in Section 1.91, California sheephead, ocean whitefish, and all greenlings of the genus *Hexagrammos*. For specific definitions, applicability, and procedures, see sections 1.91 and 27.20. For size limits, possession limits, and other regulations that apply to individual species, see specific sections beginning with Section 27.60.

(a) The San Francisco Groundfish Management Area means ocean waters between 38° 57.50' N. lat. (at Point Arena, Mendocino County) and 37° 11' N. lat. (at Pigeon Point, San Mateo County).

(b) Seasons and depth constraints (except as provided in subsection (c) below):

(1) January 1 through ~~April 14~~March 31: Closed.

(2) April 1 through December 31: Take of all species is prohibited seaward of a line approximating the 40-fathom depth contour along the mainland coast and along islands and offshore seamounts. The 40-fathom depth contour is defined by straight lines connecting the set of 40-fathom waypoints as adopted in Federal regulations (50 CFR Part 660, Subpart G).

~~(c) Special exceptions to subsection (b) above:~~

~~(1)(c)~~ Leopard shark may be taken or possessed in Drake's Bay, Bolinas Bay, Tomales Bay, Bodega Harbor, and San Francisco Bay year-round.

~~(2) California scorpionfish.~~

~~(A) April 15 through August 31: Take is prohibited seaward of a line approximating the 40-fathom depth contour along the mainland coast and along islands and offshore seamounts. The 40-fathom depth contour is defined by straight lines connecting the set of 40-fathom waypoints as adopted in Federal regulations (50 CFR Part 660, Subpart G).~~

~~(B) September 1 through December 31: Closed.~~

Note: Authority cited: Sections 200, 205, 265 and 702, Fish and Game Code.

Reference: Sections 200, 205, 265, 1802 and 7071, Fish and Game Code; 50 CFR Part 660, Subpart G.

#### **Amend Section 27.40, Title 14, CCR, as follows:**

#### **§ 27.40. Central Groundfish Management Area.**

This Section applies to take and possession of federally-managed groundfish species as defined in Section 1.91, California sheephead, ocean whitefish, and all greenlings of the genus *Hexagrammos*. For specific definitions, applicability, and procedures, see sections 1.91 and 27.20. For size limits, possession limits, and other regulations that apply to individual species, see specific sections beginning with Section 27.60.

(a) The Central Groundfish Management Area means ocean waters between 37° 11' N. lat. (at Pigeon Point, San Mateo County) and 34° 27' N. lat. (at Point Conception, Santa Barbara County).

(b) Seasons and depth constraints (except as provided in subsection (c) below):

(1) January 1 through March 31: Closed.

(2) April 1 through December 31: Take of all species is prohibited seaward of a line approximating the 50-fathom depth contour along the mainland coast and along islands and offshore seamounts. The 50-fathom depth contour is defined by straight lines connecting the set of 50-fathom waypoints as adopted in Federal regulations (50 CFR Part 660, Subpart G).

~~(c) Special exceptions to subsection (b) above:~~

~~(1)(c)~~ Leopard shark may be taken or possessed in Elkhorn Slough year-round.

~~(2) California scorpionfish.~~

~~(A) April 1 through August 31: Take is prohibited seaward of a line approximating the 50-fathom depth contour along the mainland coast and along islands and offshore~~

~~seamounts. The 50-fathom depth contour is defined by straight lines connecting the set of 50-fathom waypoints adopted in Federal regulations (50 CFR Part 660, Subpart G).~~  
~~(B) September 1 through December 31: Closed.~~

Note: Authority cited: Sections 200, 205 and 265, Fish and Game Code. Reference: Sections 200, 205, 265, 1802 and 7071, Fish and Game Code; and 50 CFR Part 660, Subpart G.

**Amend Section 27.45, Title 14, CCR, as follows:**

**§ 27.45. Southern Groundfish Management Area.**

This Section applies to take and possession of federally-managed groundfish species as defined in Section 1.91, California sheephead, ocean whitefish, and all greenlings of the genus *Hexagrammos*. For specific definitions, applicability, and procedures, see sections 1.91 and 27.20. For size limits, possession limits, and other regulations that apply to individual species, see specific sections beginning with Section 27.60.

(a) The Southern Groundfish Management Area means ocean waters between 34° 27' N. lat. (at Point Conception, Santa Barbara County) and the U.S./Mexico border. The Cowcod Conservation Areas are special closure areas within the Southern Groundfish Management Area.

(b) Seasons and depth constraints (except as provided in subsection (c) below):

(1) January 1 through the last day in February: Closed, except take of California scorpionfish is prohibited seaward of a line approximating the 75-fathom depth contour, defined by connecting the appropriate waypoints adopted in Federal regulations (50 CFR Part 660, Subpart G).

(2) March 1 through December 31: Take of all species is prohibited seaward of a line approximating the ~~60~~75-fathom depth contour along the mainland coast and along islands and offshore seamounts. The ~~60~~75-fathom depth contour is defined by straight lines connecting the set of ~~60~~75-fathom waypoints as adopted in Federal regulations (50 CFR Part 660, Subpart G).

(c) Special exceptions to subsection (b) above:

(1) Regulations that apply to the Cowcod Conservation Areas are specified in Section 27.50.

(2) Leopard shark may be taken or possessed in Newport Bay, Alamitos Bay, Mission Bay, and San Diego Bay year-round.

~~(3) California scorpionfish.~~

~~(A) January 1 through August 31: Take is prohibited seaward of a line approximating the 60-fathom depth contour along the mainland coast and along islands and offshore seamounts. The 60-fathom depth contour is defined by straight lines connecting the set of 60-fathom waypoints as adopted in Federal regulations (50 CFR Part 660, Subpart G).~~

~~(B) September 1 through December 31: Closed.~~

Note: Authority cited: Sections 200, 205 and 265, Fish and Game Code. Reference: Sections 200, 205, 265, 1802 and 7071, Fish and Game Code; and 50 CFR Part 660, Subpart G.

**Amend Section 27.50, Title 14, CCR, as follows:**

This Section applies to take and possession of federally-managed groundfish species as defined in Section 1.91, California sheephead, ocean whitefish, and all greenlings of the genus *Hexagrammos*. For specific definitions, applicability, and procedures, see sections 1.91 and 27.20. For size limits, possession limits, and other regulations that apply to individual species, see specific sections beginning with Section 27.60.

(a) The Cowcod Conservation Areas are defined as ocean waters off southern California within each of the following two areas:

Area 1 is an area south of Point Conception that is bound by straight lines connecting the following points in the order listed:

33° 50' N. lat., 119° 30' W. long.;  
33° 50' N. lat., 118° 50' W. long.;  
32° 20' N. lat., 118° 50' W. long.;  
32° 20' N. lat., 119° 37' W. long.;  
33° 00' N. lat., 119° 37' W. long.;  
33° 00' N. lat., 119° 53' W. long.;  
33° 33' N. lat., 119° 53' W. long.;  
33° 33' N. lat., 119° 30' W. long.; and  
33° 50' N. lat., 119° 30' W. long.

Area 2 is a smaller area west of San Diego that is bound by straight lines connecting the following points in the order listed:

32° 42' N. lat., 118° 02' W. long.;  
32° 42' N. lat., 117° 50' W. long.;  
32° 36' 42" N. lat., 117° 50' W. long.;  
32° 30' N. lat., 117° 53' 30" W. long.;  
32° 30' N. lat., 118° 02' W. long.; and  
32° 42' N. lat., 118° 02' W. long.

(b) Seasons and depth constraints (except as provided in subsection (c) below):

(1) January 1 through the last day in February: ~~Closed.~~ except take of California scorpionfish is prohibited seaward of a line approximating the 40-fathom depth contour along islands and offshore seamounts, defined by connecting the appropriate waypoints adopted in Federal regulations (50 CFR Part 660, Subpart G).

(2) March 1 through December 31: ~~Open for only the~~ Take of species or species groups listed in (A) through (G) below is prohibited seaward of a line approximating the 40 fathom depth contour along islands and offshore seamounts. The 40 fathom depth contour is defined by straight lines connecting the set of 40 fathom waypoints as adopted in Federal regulations (50 CFR Part 660, Subpart G). ~~and only in waters shallower than 20 fathoms in depth as described by general depth contour lines.~~

(A) Nearshore rockfish, as defined in subsection 1.91(a)(1)

- (B) Cabezon
- (C) Greenlings of the genus *Hexagrammos*
- (D) California sheephead
- (E) Ocean whitefish
- (F) Lingcod
- (G) Shelf rockfish, as defined in subsection 1.91(a)(3), except bronzespotted rockfish, cowcod, and yelloweye rockfish which may not be taken or possessed within the Cowcod Conservation Areas.

(c) Special exceptions to subsection (b) above:

~~(1) California scorpionfish.~~

~~(A) January 1 through August 31: Take is prohibited seaward of 20 fathoms in depth, as described by general depth contour lines along the mainland coast and along islands and offshore seamounts.~~

~~(B) September 1 through December 31: Closed.~~

~~(21)~~ Notwithstanding subsection 27.20(b)(1)(C), when angling from shore (includes beaches, banks, piers, jetties, breakwaters, docks, and other man-made structures connected to the shore), only the species identified in (b)(2) above and California scorpionfish may be taken or possessed year-round. No vessel or watercraft (motorized or non-motorized) may be used to assist in taking or possessing these species while angling from shore under this provision.

~~(32)~~ Notwithstanding subsection 27.20(b)(1)(D), when diving or spearfishing, as authorized in Section 28.90, only the species identified in (b)(2) above and California scorpionfish may be taken or possessed year-round. Except for spearfishing gear, all other types of fishing gear are prohibited to be aboard the vessel or watercraft (motorized or non-motorized) while spearfishing for the purpose of taking or possessing these species under this provision.

Note: Authority cited: Sections 200, 205 and 265, Fish and Game Code. Reference: Sections 200, 205, 265, 1802 and 7071, Fish and Game Code; 50 CFR Part 660, Subpart G.

#### **Amend Section 28.27, Title 14, CCR, as follows:**

##### **§ 28.27. Lingcod.**

(a) Open areas, seasons, and depth constraints: See Section 27.20 through Section 27.50 for definitions, special closure areas, and exceptions. Take and possession is authorized as follows:

- (1) Northern Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.25.
- (2) Mendocino Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.30.
- (3) San Francisco Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.35.

- (4) Central Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.40.
- (5) Southern Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.45.
- (6) Cowcod Conservation Areas: Open and closed dates and depth constraints as defined by Section 27.50.
- (b) Limit is authorized as follows: Two.
- (1) Northern Groundfish Management Area: Two
- (2) Mendocino Groundfish Management Area: One
- (3) San Francisco Groundfish Management Area: One
- (4) Central Groundfish Management Area: One
- (5) Southern Groundfish Management Area: One
- (c) Minimum size: 22 inches total length.
- (d) Method of take: When angling, gear is restricted to not more than two hooks and one line. For purposes of this section, a hook is a single hook, or double or treble hook with multiple points connected to a common shank.
- (e) Fishing rules for lingcod may be changed during the year or in-season by the department under the authority of subsection 27.20(e). See subsection 27.20(f) for additional information.
- Note: Authority cited: Sections 200, 205, ~~220~~275, 265, 702 and 8587.1, Fish and Game Code. Reference: Sections 200, 205, 265 and 1802, Fish and Game Code; 50 CFR Part 660, Subpart G.

**Amend Section 28.55, Title 14, CCR, as follows:**

**§ 28.55. Rockfish (*Sebastes*).**

- (a) Open areas, seasons, and depth constraints: See Section 27.20 through Section 27.50 for definitions, special closure areas, and exceptions. Take and possession is authorized as follows:
- (1) Northern Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.25.
- (2) Mendocino Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.30.
- (3) San Francisco Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.35.
- (4) Central Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.40.
- (5) Southern Groundfish Management Area: Open and closed dates and depth constraints as defined by Section 27.45.
- (6) Cowcod Conservation Areas: Open and closed dates and depths constraints as defined by Section 27.50. Only Nearshore Rockfish, and Shelf Rockfish, as defined in



subsections 1.91(a)(1) and 1.91(a)(3), may be taken and possessed, except as provided below in subsection (b)(1).

(b) Limit: Ten, within the Rockfish, Cabezon, and Greenling complex (RCG complex, as defined in Section 1.91) limit of 10 fish, in any combination of species, except as provided below.

(1) The limit on bronzespotted rockfish, cowcod, and yelloweye rockfish is zero. These species shall not be taken or possessed as part of the RCG limit.

(2) The limit on canary rockfish is ~~one~~two fish, within the RCG bag limit.

(3) The limit on black rockfish is three fish, within the RCG limit.

(4) In the Cowcod Conservation Areas (see Section 27.50), the limit on slope rockfish, as defined in subsection 1.91(a)(4), is zero. These species shall not be taken or possessed as part of the RCG limit in the Cowcod Conservation Areas.

(c) Size limit: None.

(d) Method of take: When angling, gear is restricted to not more than two hooks and one line. For purposes of this section, a hook is a single hook, or a double or treble hook with multiple points connected to a common shank.

(e) Fishing rules for rockfish may be changed during the year or in-season by the department under the authority of subsection 27.20(e). See subsection 27.20(f) for additional information.

Note: Authority cited: Sections 200, 205, 265, 702, 7071 and 8587.1, Fish and Game Code. Reference: Sections 200, 205, 265, 1802, 7071 and 8585.5, Fish and Game Code; 50 CFR Part 660, Subpart G.

**Amend Section 52.10, Title 14, CCR, as follows:**

**§ 52.10. Take of Sheephead, Cabezon and Greenling.**

(a) Total Allowable Catches (TACs) and Allocations. Based on total allowable catches specified for each calendar year, catch may not exceed the following amounts:

(1) California sheephead. The statewide allowable catch of sheephead is 205,500 pounds, allocated as follows:

(A) The commercial fishery is allocated 75,200 pounds.

(B) The recreational fishery is allocated 130,300 pounds.

(2) Cabezon. ~~The total statewide allowable catch of cabezon is 326,200 pounds, allocated as follows:~~ The statewide total allowable catch will not exceed the amount specified in 50 CFR Part 660, Subpart C.

~~(A) The commercial fishery is allocated 127,200 pounds.~~

~~(B) The recreational fishery is allocated 199,000 pounds.~~

(3) Greenlings of the genus Hexagrammos. ~~The total statewide allowable catch of greenlings is 121,900 pounds, allocated as follows:~~ The statewide total allowable catch will not exceed the amount specified in 50 CFR Part 660, Subpart C.

~~(A) The commercial fishery shall be managed not to exceed, 55,400 pounds, the remaining amount after subtracting the recreational allocation from the TAC. The~~

~~commercial fishery shall be closed or modified in-season pursuant to the rules in section 52.10(b) through 52.10(d).~~

~~(B) The recreational fishery is allocated 66,500 pounds.~~

(b) Mechanism for Fishery Closures. The department will estimate from the current trends in catch and using the best available scientific information the time at which any commercial or recreational fishery allocation or total allowable catch for sheephead, cabezon, or greenlings specified in subsection (a) will be reached. The department will close the fishery at the time the allocation or total allowable catch is reached or is projected to be reached prior to the end of the calendar year.

(c) The department shall give the public and the commission no less than 10 days notice of any recreational fishery closure pursuant to this Section via a department news release.

(d) The department shall give holders of nearshore fishery permits no less than 10 days notice of any commercial fishery closure pursuant to this Section via a notification letter sent to the permittee's address on file with the department. The department shall give the public and the commission no less than 10 days notice of any commercial fishery closure pursuant to this Section via a department news release.

Note: Authority cited: Sections 200, ~~202265~~, 702, 7071 and 8587.1, Fish and Game Code. Reference: Sections 97, 205, 1802, 7056, 7071, 8585.5, 8586, 8587 and 8587.1, Fish and Game Code.

**Amend Section 150.16, Title 14, CCR, as follows:**

**§ 150.16. Commercial Take of Nearshore Fishes.**

(a) Notwithstanding Section 8588(b) of the Fish and Game Code, minimum size limits (total length) are as follows:

(1) black-and-yellow rockfish ( <i>Sebastes chrysomelas</i> )	10 in.
(2) cabezon ( <i>Scorpaenichthys marmoratus</i> )	15 in.
(3) California scorpionfish or sculpin ( <i>Scorpaena guttata</i> )	10 in.
(4) California sheephead ( <i>Semicossyphus pulcher</i> )	13 in.
(5) China rockfish ( <i>Sebastes nebulosus</i> )	12 in.
(6) gopher rockfish ( <i>Sebastes carnatus</i> )	10 in.
(7) grass rockfish ( <i>Sebastes rastrelliger</i> )	12 in.

(8) greenlings of the genus <i>Hexagrammos</i> ( <i>Hexagrammos</i> spp.)	12 in.
(9) kelp rockfish ( <i>Sebastes atrovirens</i> )	10 in.

(b) Species of nearshore fish stocks as defined in Section 1.90, Title 14, CCR, must be sorted by species prior to weighing and the weight reported separately on the Fish and Game receipt.

(c) Any nearshore fish listed under this section that are taken in a nearshore fishery shall be measured immediately upon being brought aboard the vessel and released immediately if not in compliance with the size limits specified.

(d) Regulations adopted to modify the minimum size limits or to specify maximum size limits shall be based on the best available scientific information and adopted pursuant to the Administrative Procedure Act following public notice and not less than one public hearing.

(e) Cumulative trip limits for sheephead, cabezon, greenlings of the genus *Hexagrammos*, California scorpionfish, and subgroups of rockfish.

(1) A cumulative trip limit is the total number of pounds of a species or a species group that may be taken and retained, possessed, or landed by an individual commercial licensee in a cumulative trip limit period without a limit on the number of landings or trips.

(2) Cumulative trip limit periods start at 0001 hours local time, end at 2400 hours local time, and are in two month periods as follows:

(A) January 1 through the last day of February,

(B) March 1-April 30,

(C) May 1-June 30,

(D) July 1-August 31,

(E) September 1-October 31,

(F) November 1-December 31.

(3) Landings toward a cumulative trip limit value for a defined cumulative trip limit period provided in this subsection are summed by an individual's California commercial license number listed on fish receipts submitted to the department pursuant to Section 8043, Fish and Game Code.

(4) Any person landing species for which there is a cumulative trip limit established pursuant to this Section shall keep in their immediate possession copies of any and all reports of landings required by state laws or regulations throughout the cumulative limit period during which a landing occurred and for 15 days thereafter.

(5) Cumulative trip limit values noticed in the Federal Register by the National Marine Fisheries Service for the cumulative trip limit periods for shallow nearshore rockfish, deeper nearshore rockfish, and California scorpionfish apply to each individual California commercial licensee in addition to the federally-defined vessel-based limits. Landings are summed by an individual's California commercial license number listed on fish receipts submitted to the department pursuant to Section 8043, Fish and Game Code.

(6) Cumulative trip limits for sheephead, cabezon and greenlings.

(A) The cumulative trip limit per individual per two-month limit period when fishing is allowed pursuant to Section 150.06, Title 14, CCR, is as follows:

	<i>Sheephead</i>	<i>Cabazon</i>	<i>Greenlings</i>
--	------------------	----------------	-------------------

January-February	2,000 pounds	<del>300</del> <u>500</u> pounds	<del>150</del> <u>250</u> pounds
March-April	2,000 pounds	<del>400</del> <u>500</u> pounds	<del>150</del> <u>250</u> pounds
May-June	2,400 pounds	500 pounds	<del>200</del> <u>250</u> pounds
July-August	2,400 pounds	500 pounds	<del>200</del> <u>250</u> pounds
September-October	2,400 pounds	500 pounds	<del>200</del> <u>250</u> pounds
November-December	2,400 pounds	<del>300</del> <u>500</u> pounds	<del>150</del> <u>250</u> pounds

(B) The department will evaluate year-to-date catch levels against total allowable catch limits defined in Section 52.10. Based on these data, when the department determines that cumulative trip limits defined in this Section need significant adjustment upward or downward (by 50 percent or more) in order to spread the allowable catches through the open season to the extent possible and prevent early attainment of the annual total allowable commercial catch, the cumulative trip limits defined in this Section may become inoperative and may be replaced with alternative limits as determined by the department. The department may perform these in-season analyses between May and September of each year; and provide notification of changes by October 15 of each year, as described in subsection (e)(6)(C).

(C) The department shall give ~~holders of nearshore fishery permits~~nearshore fishery permittees no less than 10 days notice of any cumulative trip limit change pursuant to this Section via a notification letter sent to the permittee's address on file with the department.

(D) When allocations, total allowable catches or other catch limits defined in Section 52.10 are reached, and action to close the fishery is taken pursuant to Section 52.10 subsection (b), cumulative trip limits defined in this Section become inoperative.

(f) All other trip limits (including daily, weekly and cumulative trip limits) established for commercial rockfish, a subgroup of rockfish, or California scorpionfish noticed in the Federal Register by the National Marine Fisheries Service shall apply in state waters within the geographic boundary areas defined in Title 50, Code of Federal Regulations (CFR), Parts 600 and 660. See also Section 189, Title 14, California Code of Regulations for additional requirements regarding fishing for federal groundfish in state waters.

Note: Authority cited: Sections 702, 7071, 8587.1 and 8588, Fish and Game Code.

Reference: Sections 97, 205, 1802, 8585.5, 8586, 8587, 8587.1 and 8588, Fish and Game Code.

# Groundfish Fishery: Proposed Changes for 2019-2020



**California Fish and Game Commission Meeting**

October 17, 2018 • Fresno, CA

California Department of Fish and Wildlife

# Background

- Pacific Fishery Management Council's biennial process completed in June 2018
  - Changes in management driven by new stock assessment information
- Changes to federal regulations effective January 2019 in federal waters
- FGC typically takes conforming regulatory action for state waters

# 2019-2020 Bycatch Limits Overfished Species

## Yelloweye rockfish

2018 California recreational limit =  
3.9 metric tons (mt)

2019-2020 California recreational limits =  
9.1/9.4 mt



Photo Credit: WDFW

## Cowcod

2018 California limit = 2.6 mt

2019-2020 California limit = 3.8 mt



Photo Credit: J. Grebel

# Recreational Seasons and Depths

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 1 – Oct 31 <30 fm						All Depth	
Mendocino	Closed				May 1 – Oct 31 <20 fm						All Depth	
San Francisco	Closed			Apr 1 – Dec 31 <40 fm								
Central	Closed			Apr 1 – Dec 31 <50 fm								
Southern	Closed		Mar 1 – Dec 31 <75 fm									
CCA	Closed		Mar 1 – Dec 31 <40 fm									

fm = fathoms

CCA = Cowcod Conservation Area



# California Scorpionfish

- Annual Catch Limit doubles in 2019 as a result of most recent stock assessment
- Return of year round fishery in Southern Management Area



Photo Credit: PSMFC

# Lingcod

## Recreational Bag Limit

- Recent stock assessment results for areas south of Cape Mendocino less optimistic
- Reduce bag limit from two to one fish in the Mendocino, San Francisco, Central, and Southern Management Areas
- No changes to bag limit in Northern Management Area



Photo Credit: WDFW

# Canary Rockfish

## Recreational Bag Limit

- Declared rebuilt in 2015
- Managing with precaution
- Bag limit is two fish within the RCG (Rockfish, Cabezon, Greenling) bag limit



Photo Credit: PSMFC

# Proposed Commercial Changes

- Increases to commercial trip limits
  - Cabezon: 500 lb each open 2-month period
  - Greenling: 250 lb each open 2-month period

# Department Recommendations for December

- Adopt proposed changes to Title 14, §27.30 et al including:
  - Changes to recreational:
    - Season lengths
    - Depth constraints
    - Bag limits
  - Changes to commercial trip limits

# Thank You



Photo Credit: CDFW



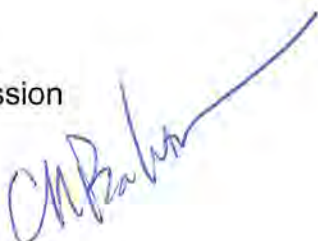
## Memorandum

2018 JUL 30 PM 1:30

Date: July 26, 2018

To: Valerie Termini  
Executive Director  
Fish and Wildlife Commission

From: Charlton H. Bonham  
Director



Subject: **Agenda Item for the August 22-23, 2018 Fish and Game Commission Meeting - Initial Statement of Reasons to Amend Section 29.15 Re: Red Abalone Regulations**

At its June 20th meeting, the Fish and Game Commission (Commission) authorized notice of its intent to amend regulations for the recreational abalone fishery to extend the fishery closure sunset date an additional two years from April 1, 2019 to April 1, 2021. Authorization of this request will allow for possible adoption at the December 12, 2018 Commission meeting.

The Department of Fish and Wildlife (Department) is submitting the attached Initial Statement of Reasons (ISOR) with a single regulatory option to extend the closure sunset date as described above.

The Department recommends the extension of the closure for the recreational abalone fishery. This recommendation is consistent with the ARMP and reflects the evidence that the abalone resource and current environmental conditions remain unchanged since adoption of the closure late last year.

If you have any questions or need additional information, please contact Dr. Craig Shuman, Marine Regional Manager at (916) 445-6459.

Attachment

cc: Stafford Lehr, Deputy Director  
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Craig Shuman, D. Env., Regional Manager  
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Valerie Termini, Executive Director  
Fish and Game Commission  
July 19, 2018  
Page 2

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STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION

Amend Section 29.15  
Title 14, California Code of Regulations  
Re: Recreational Take of Red Abalone

I. Date of Initial Statement of Reasons: June 27, 2018

II. Dates and Locations of Scheduled Hearings

- |                         |           |                   |
|-------------------------|-----------|-------------------|
| (a) Notice Hearing:     | Date:     | August 22, 2018   |
|                         | Location: | Fortuna, CA       |
| (b) Discussion Hearing: | Date:     | October 17, 2018  |
|                         | Location: | Fresno, CA        |
| (c) Adoption Hearing:   | Date:     | December 12, 2018 |
|                         | Location: | Oceanside, CA     |

III. Description of Regulatory Action

- (a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

**Background Information**

Red abalone is a resource currently managed by the California Department of Fish and Wildlife (Department) under the Abalone Recovery and Management Plan (ARMP), adopted by the Fish and Game Commission (Commission) in 2005. The Commission is the decision-making body that regulates the recreational take of abalone (sections 200 and 205, Fish and Game Code).

A fishery management plan (FMP) for red abalone is under development by the Department to guide future management actions for the northern California recreational fishery, separate from the ARMP. It is anticipated that the Commission will discuss this document at its October 2018 meeting and potentially consider its adoption in February 2019. Once a FMP for red abalone is adopted, the FMP will guide the future management of the red abalone fishery.

In September 2017, the Department identified wide-sweeping changes in density, occurrence, depth distribution, size and health of red abalone as well as the kelp upon which it depends for food (Commission 2017). In addition, the Department found that the average density of red abalone populations has declined below the ARMP fishery closure trigger of 0.30 abalone/m<sup>2</sup>, indicating that the stock could no longer support a fishery. In response to the Department findings of a dramatic fishery wide decline of red abalone populations from severe starvation conditions, the Commission adopted regulations to

close the recreational abalone fishery consistent with the ARMP in December 2017. The Commission also adopted a sunset provision for the closure based on significant public comments received during the rulemaking process to address concerns of fishery closure for an indeterminate period. The fishery would re-open on April 1, 2019, or upon adoption of a red abalone FMP and the guidance it provides for fishery reopening, whichever comes first. The regulations closing the recreational abalone fishery became effective on March 29, 2018.

### **Current Regulations**

Current recreational abalone fishing regulations in Section 29.15, Title 14, California Code of Regulations (CCR) specify: open areas, season, hours, daily limits, special gear provisions, measuring devices, abalone report card requirements, and minimum size limit. Subsection 29.15(i) closes all ocean waters to the take of abalone beginning on April 1, 2018. This regulation is only in effect until April 1, 2019; if the regulations are not amended to delete or extend that date (subsection 29.15(j)), the fishery will re-open on April 1, 2019, which will allow for the recreational take of abalone in open fishing areas during the open season (subsections 29.15(a), (b), and (c)).

Since the closure of the recreational fishery, the Department has found no meaningful changes in the abalone resource conditions described in the September 2017 ISOR. The Department received documented reports from the public of dead and dying abalone washed ashore at various locations in Sonoma and Mendocino counties over the 2017/18 winter and spring seasons. This information suggests that abalone continue to be weak and die due to current environmental conditions and thus no substantial positive changes since last year. The Department concludes that re-opening the fishery at this time would be inconsistent with the ARMP and would be detrimental to the recovery of the red abalone populations.

### **Proposed Amendment**

The Commission is proposing to amend subsection 29.15(j) to extend the closure of the abalone fishery beyond the current April 1, 2019 sunset date. This proposal extends the sunset date for another two years, until April 1, 2021. Effective dates for take and possession contained in subsections 29.15 (a), (b) and (c) of the abalone fishing regulations would be updated as well to reflect the proposed change.

This proposal allows for consideration of a fishery re-opening prior to reaching full recovery (i.e., re-opening the fishery before density standards are fully realized under the ARMP or a red abalone FMP upon adoption by the Commission). The Department recommends, however, consideration of the management triggers in the ARMP (or a Red Abalone FMP once adopted by the Commission) to determine whether re-opening the fishery to recreational harvesting is warranted.

This proposed regulatory change is necessary to facilitate recovery of the red abalone population while the preparation of the Red Abalone FMP is currently underway.

(b) Goals and Benefits of the Regulation:

The policy of this State is “to ensure the conservation, sustainable use, and, where feasible, restoration of California’s marine living resources for the benefit of all the citizens of the State” (Fish and Game Code section 7050(b)). The proposed regulation changes are intended to facilitate the red abalone population’s recovery from the multi-year poor environmental conditions and massive losses of red abalone fishery stock.

The proposed extension of the red abalone fishery closure will benefit the valuable red abalone resource by protecting it from fishing mortality during the current poor environmental conditions. Further conserving the red abalone resource now will allow it the opportunity to rebuild and be sustainable for the future.

(c) Authority and Reference Sections from Fish and Game Code for Regulation:

Authority: Sections 200, 205, 260, 265, 399, 5520, 5521, and 7149.8, Fish and Game Code.

Reference: Sections 200, 205, 265, 275, 5520, 5521, 7145 and 7149.8, Fish and Game Code.

(d) Specific Technology or Equipment Required by Regulatory Change:

None.

(e) Identification of Reports or Documents Supporting Regulation Change:

California Department of Fish and Wildlife. 2005. Abalone Recovery and Management Plan. <https://www.wildlife.ca.gov/Conservation/Marine/ARMP>.

Fish and Game Commission. (Commission 2017). Initial Statement of Reasons for Regulatory Action to Amend Section 29.15, Title 14, California Code of Regulations, Re: Abalone Regulations. [http://www.fgc.ca.gov/regulations/2017/29\\_15isor.pdf](http://www.fgc.ca.gov/regulations/2017/29_15isor.pdf).

(f) Public Discussions of Proposed Regulations Prior to Notice Publication:

June 20, 2018. Sacramento, California. The Department briefed the Commission on the status of the Red Abalone FMP and discussed potential changes to abalone regulations to amend the fishery closure sunset date.

IV. Description of Reasonable Alternatives to Regulatory Action

(a) Alternatives to Regulation Change:

Limited Fishery: A limited recreational abalone fishery (i.e., varying the degree in which the fishery is re-opened to allow for some fishing opportunity) was considered and rejected. This option is not deemed viable at this time because the Department has found no meaningful changes in three red abalone resource conditions: fishing grounds, health, and

reproduction. No other alternatives were identified by or brought to the attention of Commission staff that would have the same desired regulatory effect.

(b) No Change Alternative:

Without the proposed regulatory change, the recreational red abalone fishery will re-open on April 1, 2019, and recreational abalone fishing regulations will revert to those that existed before the 2016 emergency rulemaking. Evidence exists that levels of take prior to the emergency rulemaking will be unsustainable under current environmental and stock health conditions. The no change alternative is not consistent with established ARMP triggers and management measures.

(c) Description of Reasonable Alternatives That Would Lessen Adverse Impact on Small Business:

In view of information currently possessed, no reasonable alternative considered would be more effective in carrying out the purpose for which the regulation is proposed, would be as effective and less burdensome to affected private persons than the proposed regulation, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

V. Mitigation Measures Required by Regulatory Action

The proposed regulatory action will have no negative impact on the environment; therefore, no mitigation measures needed.

VI. Impact of Regulatory Action

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made:

(a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

The proposed action will not have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states because the regulatory action is not likely to significantly increase compliance costs, may or may not significantly impact fishery activity, and only applies to a fishery that is unique to the state of California.

(b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:

The Commission does not anticipate any impacts on the creation or elimination of jobs, the creation of new business, the elimination of existing businesses or the expansion of businesses in California

The Commission anticipates no impacts on the creation or elimination of jobs within the state; no impact on the creation of new businesses or the elimination of existing businesses or the expansion of businesses in California; generalized benefits to the health and welfare of California residents; no effects on worker safety; and benefits to the State's environment. The proposed action is designed to ensure the sustainability and quality of the fishery, promoting participation, fishing activity, and economic activity.

(c) Cost Impacts on a Representative Private Person or Business:

The agency is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

(d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State:

No new costs or savings to State agencies. However, the proposed abalone fishery closure would result in the continued reduction in abalone report card sales with revenue deficits to the California Department of Fish and Wildlife of about \$533,375 for the 2019-20 and 2020-21 fiscal years based on the typical sales of 25,100 at \$21.25 per card. Federal funding to the state would not be impacted by this proposed change in recreational abalone fishing regulations.

(e) Nondiscretionary Costs/Savings to Local Agencies: None.

(f) Programs Mandated on Local Agencies or School Districts: None.

(g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code: None.

(h) Effect on Housing Costs: None.

## VII. Economic Impact Assessment

Without the proposed changes, the recreational abalone fishery will re-open on April 1, 2019. Amendments to the fishery closure provision for red abalone are to preserve the sustainability of the resource and, thus, the long-term viability of the fishery that should continue to draw economic benefit to coastal communities in the fishery area. An economic impact analysis (Commission 2017) evaluated the effect of a full fishery closure as well as options for a limited fishery. The economic impact associated with an extended closure of the fishery is expected to remain more or less the same as the full fishery closure option evaluated in the 2017 ISOR.

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State:

The Commission anticipates no negative impacts on the creation or elimination of jobs within the state. Since the closure of the abalone fishery on April 1, 2018, no changes in employment is anticipated in direct relation to the proposed changes. The proposed action is designed to ensure the sustainability and quality of the fishery, promoting participation, fishing activity, and economic activity.

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State:

The Commission does not anticipate the impact of continued closure of the red abalone fishery to be a principle impetus for the creation of new businesses or the elimination of existing businesses within the state. Since the closure of the abalone fishery on April 1, 2018, no change is anticipated in direct relation to the creation of new businesses or the elimination of existing businesses within the state from the proposed action. Extending the fishery closure is only proposed to preserve the sustainability of the abalone resource and, thus, the long-term viability of the fishery that may then continue to support fishery related businesses.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State:

The Commission does not anticipate the impact of continued closure of the red abalone fishery to have a significant impact on the expansion of businesses currently doing business within the state. Extending the fishery closure is only proposed to preserve the sustainability of the resource and, thus, the long-term viability of the fishery that may then continue to support fishery-related businesses.

(d) Benefits of the Regulation to the Health and Welfare of California Residents:

The Commission anticipates generalized benefits to the health and welfare of California residents through the sustainable management of the red abalone fishery.

(e) Benefits of the Regulation to Worker Safety: None.

(f) Benefits of the Regulation to the State's Environment:

The Commission anticipates benefits to the State's environment. It is the policy of this State to ensure "the conservation, sustainable use, and, where feasible, restoration of California's marine living resources for the benefit of all the citizens of the State" (Fish and Game Code sections 1700, 7050(b)).

(g) Other Benefits of the Regulation: None.

## Informative Digest/Policy Statement Overview

Red abalone is a resource currently managed by the California Department of Fish and Wildlife (Department) under the Abalone Recovery and Management Plan (ARMP). The Fish and Game Commission (Commission) is the decision-making body that regulates the recreational take of abalone (sections 200 and 205, Fish and Game Code).

In September 2017, the Department identified wide-sweeping changes in density, occurrence, depth distribution, size and health of red abalone as well as the kelp upon which it depends for food. In addition, the Department found that the average density of red abalone populations has declined below the ARMP fishery closure trigger (0.30 abalone/m<sup>2</sup>), indicating that the stock could no longer support a fishery. In December 2017, the Commission adopted regulations to close the abalone fishery consistent with the ARMP and Department findings. The Commission also adopted a sunset provision for the closure; the fishery would re-open on April 1, 2019, or upon adoption of a Red Abalone Fishery Management Plan (FMP) and the guidance it provides for fishery reopening, whichever comes first. The regulations closing the recreational abalone fishery became effective on March 29, 2018.

Current recreational abalone fishing regulations in Section 29.15, Title 14, California Code of Regulations (CCR) specify: open areas, season, hours, daily limits, special gear provisions, measuring devices, abalone report card requirements, and minimum size limit. Subsection 29.15(i) closes all ocean waters to the take of abalone beginning on April 1, 2018. This regulation is only in effect until April 1, 2019; if the regulations are not amended to delete or extend that date (subsection 29.15(j)), the fishery will re-open on April 1, 2019, which will allow for the recreational take of abalone in open fishing areas during the open season (subsections 29.15(a), (b), and (c)).

Since the closure of the recreational fishery, the Department has found no meaningful changes in the abalone resource conditions. The limited data the Department has from public reports of dead or dying abalone washing ashore during this past winter and spring corroborates the findings of no meaningful positive changes. Department concludes that re-opening the fishery at this time would be inconsistent with the ARMP and detrimental to the recovery of the fishery. The Commission is proposing to amend subsection 29.15(j) to extend the closure of the abalone fishery for another two years, until April 1, 2021. Effective dates for take and possession contained in subsections 29.15 (a), (b) and (c) of the abalone fishing regulations would be updated as well to reflect the proposed change. The action is necessary to facilitate recovery of the red abalone population while the preparation of the Red Abalone FMP is currently underway.

### Benefits of the Regulations

The proposed extension of the red abalone fishery closure will benefit the valuable red abalone resource by protecting it from fishing mortality during the current poor environmental conditions. Further conserving the red abalone resource now will allow it the opportunity to rebuild and be sustainable for the future.

### Consistency and Compatibility with Existing Regulations

The Legislature has delegated authority to the Commission to promulgate recreational fishing regulations (Fish and Game Code, sections 200, 205, and 265); no other state agency has the

authority to promulgate such regulations. The Commission has conducted a search of Title 14, CCR and determined that the proposed regulation is neither inconsistent nor incompatible with existing State regulations and that the proposed regulations are consistent with other recreational fishing regulations and marine protected area regulations in Title 14, CCR.



## Proposed Regulatory Language

Section 29.15, Title 14, CCR, is amended to read:

### § 29.15. Abalone

(a) Effective April 1, ~~2019~~2021: Open Area: Except in the area described in subsection (a)(1) below, abalone may only be taken north of a line drawn due west magnetic from the center of the mouth of San Francisco Bay. No abalone may be taken, landed, or possessed if landed south of this line.

(1) No Abalone may be taken in the Fort Ross area bounded by the mean high tide line and a line drawn due south true from 38°30.63' N, 123°14.98' W (the northern point of Fort Ross Cove) and a line drawn due west true from 38° 29.45' N, 123°11.72' W (Jewel Gulch, south boundary Fort Ross State Park).

(b) Effective April 1, ~~2019~~2021: Open Season and Hours:

(1) Open Season: Abalone may be taken only during the months of April, May, June, August, September, October and November.

(2) Open Hours: Abalone may be taken only from 8:00 AM to one-half hour after sunset.

(c) Effective April 1, ~~2019~~2021: Bag Limit and Yearly Trip Limit: Three red abalone, *Haliotis rufescens*, may be taken per day. No more than three abalone may be possessed at any time. No other species of abalone may be taken or possessed. Each person taking abalone shall stop detaching abalone when the limit of three is reached. No person shall take more than 18 abalone during a calendar year. In the Open Area as defined in subsections 29.15(a) and 29.15(a)(1) above, not more than 9 abalone of the yearly trip limit may be taken south of the boundary between Sonoma and Mendocino Counties.

(d) Minimum Abalone Size: All red abalone must be seven inches or greater measured along the longest shell diameter. All legal size abalone detached must be retained. No undersized abalone may be brought ashore or aboard any boat, placed in any type of receiver, kept on the person, or retained in any person's possession or under his control. Undersize abalone must be replaced immediately to the same surface of the rock from which detached. Abalones brought ashore shall be in such a condition that the size can be determined.

(e) Special Gear Provisions: The use of SCUBA gear or surface supplied air to take abalone is prohibited. Abalone may not be taken or possessed aboard any boat, vessel, or floating device in the water containing SCUBA or surface supplied air. Abalone may be taken only by hand or by devices commonly known as abalone irons. Abalone irons must be less than 36 inches long, straight or with a curve having a radius of not less than 18 inches, and must not be less than 3/4 inch wide nor less than 1/16 inch thick. All edges must be rounded and free of sharp edges. Knives, screwdrivers and sharp instruments are prohibited.

(f) Measuring Device. Every person while taking abalone shall carry a fixed caliper measuring gauge capable of accurately measuring seven inches. The measuring device shall have fixed opposing arms of sufficient length to measure the abalone by placing the gauge over the shell.

(g) Abalone Possession and Transportation:

Abalones shall not be removed from their shell, except when being prepared for immediate consumption.

(1) Individuals taking abalone shall maintain separate possession of their abalone. Abalone may not be commingled in a float tube, dive board, dive bag, or any other container or device,

- until properly tagged. Only after abalones are properly tagged, as described in Section 29.16(b), Title 14, CCR, may they be commingled with other abalone taken by another person.
- (h) Report Card Required: Any person fishing for or taking abalone shall have in their possession a nontransferable Abalone Report Card issued by the department and shall adhere to all reporting and tagging requirements for abalone defined in Sections 1.74 and 29.16, Title 14, CCR.
- (i) Effective April 1, 2018: All ocean waters are closed to the take of abalone. Abalone may not be taken or possessed. The following exceptions are for abalone in possession prior to April 1, 2018:
- (1) Minimum Abalone Size: All red abalone must be seven inches or greater measured along the longest shell diameter.
- (2) Abalone Possession and Transportation: It shall be unlawful to possess any untagged abalone or any abalone that have been removed from their shell, except when they are being prepared for immediate consumption.
- (j) This subsection and subsection (i) shall remain in effect only until April 1, ~~2019~~2021, and as of that date are repealed, unless a later enacted amendment deletes or extends that date.

Note: Authority cited: Sections 200, 205, 260, 265, 399, 5520, 5521 and 7149.8, Fish and Game Code. Reference: Sections 200, 205, 265, 275, 5520, 5521, 7145 and 7149.8, Fish and Game Code.

## STAFF SUMMARY FOR AUGUST 22-23, 2018

**12. RED ABALONE****Today's Item****Information** ☐**Action** ☒

Consider authorizing publication of notice of intent to amend regulations to extend the fishery closure sunset date for the recreational red abalone fishery.

**Summary of Previous/Future Actions**

- |                                 |                                 |
|---------------------------------|---------------------------------|
| • <b>Today's notice hearing</b> | <b>Aug 22-23, 2018; Fortuna</b> |
| • Discussion hearing            | Oct 17-18, 2018; Fresno         |
| • Adoption hearing              | Dec 12-13, 2018; Oceanside      |

**Background**

In Sep 2017, DFW identified sweeping changes in density, occurrence, depth distribution, size and health of red abalone as well as the kelp upon which it depends for food. In addition, DFW found that the average density of red abalone populations has declined below the Abalone Recovery and Management Plan (ARMP) fishery closure trigger of 0.30 abalone per square meter, indicating that the stock could no longer support a fishery.

In response to the DFW findings of a dramatic fishery-wide decline of red abalone populations from severe starvation conditions, in Dec 2017 FGC adopted regulations to close the recreational abalone fishery consistent with the ARMP. FGC also adopted a sunset provision for the closure based on significant public comments received during the rulemaking process to address concerns about having a fishery closure for an indeterminate period. Under existing regulations, the fishery would re-open on Apr 1, 2019, or upon adoption of a red abalone fishery management plan (FMP) and the guidance it provides for fishery reopening, whichever comes first.

The regulations closing the recreational abalone fishery became effective on Mar 29, 2018. If the existing regulations are not amended to delete or extend the sunset date (subsection 29.15(j)), the fishery will re-open on Apr 1, 2019, which will allow for the recreational take of abalone in open fishing areas during the open season (subsections 29.15(a), (b), and (c)).

Since the closure of the recreational fishery, DFW has found no meaningful changes in the abalone resource conditions described in the Sep 2017 initial statement of reasons. DFW received documented reports from the public of dead and dying abalone washed ashore at various locations in Sonoma and Mendocino counties over the 2017/18 winter and spring seasons. This information suggests that abalone continue to be weak and die due to current environmental conditions and, thus, there are no substantial positive population changes since last year. DFW concludes that re-opening the fishery at this time would be inconsistent with the ARMP and would be detrimental to the recovery of red abalone populations.

***Proposed Amendment***

DFW proposes to extend the closure of the abalone fishery beyond the current Apr 1, 2019 sunset date for another two years, until Apr 1, 2021. Effective dates for take and possession

## STAFF SUMMARY FOR AUGUST 22-23, 2018

contained in the abalone fishing regulations would be updated as well to reflect the proposed change.

DFW's proposal allows for consideration of a fishery re-opening prior to reaching full recovery (i.e., re-opening the fishery before density standards are fully realized under the ARMP or a red abalone FMP upon adoption by FGC). DFW recommends, however, considering the management triggers in the ARMP or a red abalone FMP once adopted by FGC to determine whether re-opening the fishery to recreational harvesting is warranted. The proposed regulation change is necessary to facilitate recovery of the red abalone population while preparation of the red abalone FMP is currently underway.

**Public Comments (N/A)****Recommendation**

**FGC staff:** Authorize publication of the notice as recommended by DFW.

**DFW:** Authorize publication of the notice as detailed in the draft initial statement of reasons (ISOR).

**Exhibits**

1. DFW memo, received Jul 30, 2018
2. Draft ISOR

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Fish and Game Commission authorizes publication of a notice of its intent to amend Section 29.15, related to recreational red abalone fishing regulations.

# Notice of Exemption

## Appendix E

**To:** Office of Planning and Research  
P.O. Box 3044, Room 113  
Sacramento, CA 95812-3044

County Clerk

County of: N/A

**From:** (Public Agency): CA Fish and Game Commission  
1416 Ninth Street, Room 1320  
Sacramento, CA 95814

(Address)

Project Title: Amend § 29.15, Title14, CCR, Abalone take reduction due bad environmental conditions

Project Applicant: N/A

Project Location - Specific:  
Statewide

Project Location - City: N/A

Project Location - County: N/A

Description of Nature, Purpose and Beneficiaries of Project:

A combination of environmental and biological stressors has greatly reduce abalone populations due to starvation conditions. In 2016, the Commission took emergency action to reduce the annual take limit and close the season in April and November. This project will continue the emergency regulations protection.

Name of Public Agency Approving Project: California Fish and Game Commission

Name of Person or Agency Carrying Out Project: California Department of Fish and Wildlife

Exempt Status: **(check one):**

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: Cal. Code Regs., tit. 14, §§ 15307, 15308
- ☐ Statutory Exemptions. State code number: \_\_\_\_\_

Reasons why project is exempt:

See attached.

Lead Agency  
Contact Person: Melissa Miller-Henson Area Code/Telephone/Extension: (916) 653-4899

**If filed by applicant:**

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☒ Yes ☐ No

Signature: \_\_\_\_\_ Date: 12/12/2018 Title: Acting Executive Director

☒ Signed by Lead Agency ☐ Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.  
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR: \_\_\_\_\_

December 12, 2018

**ATTACHMENT TO NOTICE OF EXEMPTION  
Adoption of Red Abalone Take Reduction  
Due to Harmful Environmental Conditions**

The California Fish and Game Commission (Commission) has taken final action under the Fish and Game Code and the Administrative Procedure Act (APA) with respect to the proposed project on December 12, 2018. In taking its final action for the purposes of the California Environmental Quality Act (CEQA, Pub. Resources Code, § 21000 *et seq.*), the Commission adopted the regulations relying on the categorical exemption for “Actions by Regulatory Agencies for Protection of Natural Resources” contained in CEQA Guidelines section 15307, and the categorical exemption for “Actions by Regulatory Agencies for Protection of the Environment” contained in CEQA Guidelines section 15308. (Cal. Code Regs., tit. 14, §§ 15307, 15308.)

**Categorical Exemptions to Protect Natural Resources and the Environment**

In adopting the sport fishing regulations for red abalone take reduction due to harmful environmental conditions, the Commission relied for purposes of CEQA on the Class 7 and 8 categorical exemptions. In general, both exemptions apply to agency actions to protect natural resources and the environment. The regulations define annual fishing seasons and daily and yearly bag limits. A combination of unprecedented environmental and biological stressors began to take their toll on abalone populations, including warmer-than-normal waters and decreasing food resources, leading to starvation conditions. The Department of Fish and Wildlife (Department) has identified wide-sweeping changes in the density, occurrence, size and health of red abalone and the kelp upon which it depends for food. Because these regulations are intended to protect the sustainability of the fishery as a natural resource, Commission adoption of these regulations is an activity that is the proper subject of CEQA’s Class 7 and 8 categorical exemptions.

---

**From:** Traverso, Jordan@Wildlife  
**Sent:** Thursday, August 23, 2018 4:56 PM  
**To:** FGC  
**Subject:** FW: Closing Ab season. I have been diving here since 1974. I can see how the sea urchins are taking. Just closing the season is not the cure. Promote abating the sea urchin. Curtis Carley

**From:** curtis carley ·  
**Sent:** Thursday, August 23, 2018 4:41 PM  
**To:** Traverso, Jordan@Wildlife <Jordan.Traverso@wildlife.ca.gov>  
**Subject:** Closing Ab season. I have been diving here since 1974. I can see how the sea urchins are taking. Just closing the season is not the cure. Promote abating the sea urchin. Curtis Carley

Sent from [Mail](#) for Windows 10



2018 OCT -8 PM 2:45

## Memorandum

Date: October 4, 2018

To: Melissa Miller-Henson  
Acting Executive Director  
California Fish and Game Commission

From: Charlton Bonham  
Director



Subject: **Agenda Item for the October 17-18 Fish and Game Commission Meeting  
Regarding Approval of the Revised Marine Protected Area Monitoring Action  
Plan**

The Department of Fish and Wildlife (Department) is transmitting the revised Marine Protected Area (MPA) Monitoring Action Plan (Action Plan) and appendices to the Fish and Game Commission (Commission) for approval at their October 17 meeting in Fresno.

Since February 2018, the Department has regularly updated the Commission, the Marine Resources Committee, and the Tribal Resources Committees on the Action Plan. Notification letters were mailed to all federally recognized California Native American Tribes on February 27, 2018. The Action Plan was distributed upon request to the California Native American Tribes on July 9, 2018 and was made available to the public on July 16, 2018. The Action Plan underwent a public comment period and scientific peer review during July and August 2018. Staff gave an informational presentation at the August 22-23 Commission meeting summarizing the purpose and timeline for finalizing the Action Plan. The Department has prepared the revised Action Plan to address all public and peer review comments received.

If you have any questions about this item, please contact Dr. Craig Shuman, Marine Regional Manager, at (916) 445-6459. The Department's point of contact for this agenda item should identify Environmental Scientist, Sara Worden. Her contact information is (650) 631-6759 or [Sara.Worden@Wildlife.ca.gov](mailto:Sara.Worden@Wildlife.ca.gov).

### Attachments

- Revised Marine Protected Area Monitoring Action Plan
- Appendices to Revised Draft Marine Protected Area Monitoring Action Plan
- Summary of Public Comments Received and Responses
- Summary of Peer Review Comments Received and Responses



Melissa Miller-Henson  
Acting Executive Director  
California Fish and Game Commission  
October 4, 2018  
Page 2

cc: Stafford Lehr, Deputy Director  
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MARINE PROTECTED AREA MONITORING

# Action Plan

*California Department of Fish and Wildlife  
California Ocean Protection Council*

2018





## Acknowledgments

The California Department of Fish and Wildlife developed the Marine Protected Area Monitoring Action Plan in close collaboration with the California Ocean Protection Council. Insightful input was also received from a peer review panel, California Fish and Game Commission, other academic, state, and federal agencies, and the general public.

---

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# Executive Summary

**RECOGNIZING THE IMPORTANCE OF CALIFORNIA'S DIVERSE MARINE SPECIES AND ECOSYSTEMS** as vital to the state's coastal economy, public well-being, and ecological health, the California Legislature passed the Marine Life Protection Act (MLPA) in 1999. The MLPA required the state to redesign its pre-existing system of marine protected areas (MPAs) to function as a statewide network to increase its coherence and effectiveness at protecting the state's marine life, habitats, and ecosystems. The MLPA also required the adoption of a Marine Life Protection Program (now called the MPA Management Program) with six primary goals to improve the design and management of California's MPAs. An extensive public planning process for MPA design and siting was implemented across California's coast incrementally through four regional, science-based and stakeholder-driven processes, ending in December 2012 and resulting in the creation of an ecologically connected network of 124 new or redesigned MPAs and 15 special closures.

California's MPAs are adaptively managed as a network through the MPA Management Program which consists of four focal areas: 1) outreach and education, 2) enforcement and compliance, 3) research and monitoring, and 4) policy and permitting. Within the research and monitoring focal area, the California Department of Fish and Wildlife (CDFW) and California Ocean Protection Council (OPC) collaboratively direct California's MPA Monitoring Program which includes a two-phased, ecosystem-based approach. Regional baseline monitoring (Phase 1, 2007 – 2018) characterized ecological and socioeconomic conditions near the time of regional MPA implementation and improved our understanding of a variety of representative marine habitats and the associated biodiversity. CDFW and OPC are now designing and implementing statewide long-term monitoring (Phase 2, 2016 – present) to reflect current priorities and management needs.

The MPA Monitoring Action Plan (Action Plan) informs next steps for long-term MPA monitoring in California by aggregating and synthesizing work to

date, as well as by incorporating novel, quantitative, and expert-informed approaches. The Action Plan prioritizes key measures, metrics, habitats, sites, species, human uses, and management questions to target for long-term monitoring to inform the evaluation of California's MPA Network. For example, the Action Plan includes select species-level, community-level, physical, chemical, and human use measures and metrics identified to advance understanding of conditions and trends across the MPA Network. MPA index monitoring sites are prioritized based on scoring MPAs against four defined criteria that evaluated various aspects of individual MPAs, including 1) MPA design features, 2) historical coastwide monitoring, 3) habitat-based connectivity modeling, and 4) local recreational fishing effort prior to MPA implementation. These index sites are recommended using a tiered approach across three bioregions to create scalable monitoring options based on available resources and capacity. The Action Plan also provides lists of species and species groups to target for long-term monitoring, and highlights examples of existing programs that can contribute to long-term monitoring in California. In addition, the Action Plan incorporates long-term monitoring approaches to inform adaptive management. Specifically, quantitative analyses focused on detecting population responses to MPAs over time, incorporating spatial differences in fishing mortality rates, informing sample design for deep-water surveys, and comparing various fish monitoring techniques used for nearshore marine ecosystems and MPAs.

The primary intended audiences of the Action Plan include existing and potential partners interested in applying for funding to conduct MPA monitoring, as well as other entities with mandates, or interests relating to California's MPA Network. This is a living document and may be updated as needed to ensure the latest understanding of MPA network performance evaluation is reflected in the priorities of the MPA Monitoring Program.





# 1. Introduction

---

## 1.1 California's MPA Network

Recognizing the importance of California's marine resources to the state's coastal economy, public well-being, and ecological health, the California Legislature passed the Marine Life Protection Act (MLPA, Chapter 10.5 of the California Fish and Game Code [FGC], §2850-2863) in 1999. The MLPA required the state to redesign its pre-existing system of marine protected areas (MPAs) to meet six goals (Box 1).

**BOX 1: Goals of the Marine Life Protection Act (MLPA)**

**>> GOAL 1:** *Protect the natural diversity and abundance of marine life, and the structure, function, and integrity of marine ecosystems.*

**>> GOAL 2:** *Help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.*

**>> GOAL 3:** *Improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity.*

**>> GOAL 4:** *Protect marine natural heritage, including protection of representative and unique marine life habitats in California waters for their intrinsic value.*

**>> GOAL 5:** *Ensure California's MPAs have clearly defined objectives, effective management measures, and adequate enforcement, and are based on sound scientific guidelines.*

**>> GOAL 6:** *Ensure the state's MPAs are designed and managed, to the extent possible, as a network.*

To read the full text of the MLPA, please visit  
[www.wildlife.ca.gov/Conservation/Marine/MPAs/MLPA](http://www.wildlife.ca.gov/Conservation/Marine/MPAs/MLPA)

**GUIDED BY THESE SIX GOALS**, the MLPA was implemented incrementally across four planning regions through science-based and stakeholder-driven processes, resulting in the creation of an ecologically connected network of 124 MPAs. Implemented regionally, the new and revised MPAs went into effect in the central coast (Pigeon Point to Point Conception) in September 2007, the north central coast (Alder Creek near Point Arena to Pigeon Point) in May 2010, the south coast (Point Conception to U.S./Mexico border) in January 2012, and the north coast (California/Oregon border to Alder Creek) in December 2012. California's MPA Network (Figure 1) now spans the state's entire 1,100-mile coastline and encompasses approximately 740 square nautical miles (16% of California's jurisdictional waters). It is the largest network of MPAs in North America and one of the largest in the world.







**FIGURE 1: California's MPA Network**

The MPAs that comprise the Network are under several designations that reflect various management objectives (Table 1). Nine percent of state waters are no-take state marine reserves and approximately six percent of state waters are state marine conservation areas in which limited take is permitted. Special closures are not MPAs, but they do contribute to the goals of the MLPA by restricting access to waters adjacent to seabird rookeries or marine mammal haul-out sites.



**TABLE 1:** MPA and marine managed area (MMA) map color, classification, number of sites, percent of California state waters protected, and summary. For full definitions and a complete overview of MPA classifications, please refer to CDFW (2016).

MAP COLOR	CLASSIFICATION	NUMBER OF SITES	%	SUMMARY
	State Marine Reserve	49	9.0%	An MPA designation that prohibits damage or take of all marine resources (living, geologic, or cultural) including recreational and commercial take.
	State Marine Conservation Area	60	6.5%	An MPA designation that may allow some recreational and/or commercial take of marine resources (restrictions vary)
	State Marine Conservation Area (no-take)	10	0.6%	An MPA designation that generally prohibits the take of living, geological, and cultural marine resources, but allows potentially affected and ongoing permitted activities such as dredging and maintenance to continue.
	State Marine Recreational Management Area	5	0.1%	An MMA designation that limits recreational and commercial take of marine resources while allowing for legal waterfowl hunting to occur; provides subtidal protection equivalent to an MPA (restrictions vary)
	Special Closure	15 <sup>1</sup>	0.1%	An area designated by the Fish and Game Commission that prohibits access or restricts boating activities in waters adjacent to sea bird rookeries or marine mammal haul-out sites (restrictions vary)

Eight key habitats and two types of human uses (called “ecosystem features” in regional monitoring plans) were identified during Phase 1, and continue to help guide monitoring efforts: Rocky Intertidal, Kelp and Shallow Rock (0-30 m), Mid-depth Rock (30-100 m), Estuaries, Soft-bottom Intertidal and Beach, Soft-bottom Subtidal (0-100 m), Deep Ecosystems & Canyons (>100 m), Nearshore Pelagic (i.e., the water column habitat within state waters in depths >30 m), Consumptive Uses, and Non-Consumptive Uses.

1. The Commission repealed Rockport Rocks Special Closure on August 22, 2018, effective upon approval of Office of Administrative Law by January 1, 2019.

## 1.2 Management of the MPA Network

Management of California's MPA Network is guided by the 2016 MLPA Master Plan for MPAs (CDFW 2016) and the MPA Statewide Leadership Team Work Plan (OPC 2015). The MPA Management Program (Management Program) is a collaboration between the California Department of Fish and Wildlife<sup>2</sup> (CDFW), the California Fish and Game Commission<sup>3</sup> (Commission), the California Ocean Protection Council<sup>4</sup> (OPC), the MPA Statewide Leadership Team<sup>5</sup> (Leadership Team), California Native American Tribes, and non-governmental partners. This novel partnership-based approach is guided by "The California Collaborative Approach: Marine Protected Areas Partnership Plan<sup>6</sup>" (OPC 2014) and ensures that California's MPA Network is adaptively managed with active engagement across the ocean community.

### MPA Management Program Focal Areas

California's MPAs are managed as a statewide network through the Management Program. The Management Program is composed of four programmatic focal areas that require active engagement to ensure the MPA Network is adaptively managed and informed by engaged partnerships (Gleason et al. 2013, CDFW 2016).

**Outreach and education.** Outreach and education efforts primarily focus on encouraging compliance with MPA regulations. The dissemination of MPA-based regulatory, interpretive, and educational materials is a collaborative effort with partners across the state. Collaboration with CDFW and local groups on these materials improves outreach efforts by helping to tailor messaging and delivery mechanisms to reach out to California's diverse public in a consistent, cohesive, and effective manner.

**Enforcement and compliance.** The success of any MPA or MPA network relies, in part, on proper enforcement of and compliance with MPA regulations (Gleason et al. 2013, CDFW 2016). The MLPA emphasizes the importance of enforcement as a primary goal of the Management Program and identifies CDFW as the primary agency responsible

for MPA enforcement. CDFW occasionally receives assistance from other allied agencies such as the National Oceanographic and Atmospheric Administration (NOAA), the California Department of Parks and Recreation, the United States Coast Guard, local sheriffs, and the California Highway Patrol. In 2016, CDFW's Law Enforcement Division established a Marine Enforcement District, which includes 40 wildlife officers focused solely on enforcing marine regulations including MPAs.

**Research and monitoring.** The MLPA requires the MPA Network be monitored to evaluate progress toward meeting its goals, and that the results of monitoring inform adaptive management decisions. The Monitoring Program (detailed in Section 2) integrates across existing science, policy, and management needs to inform the adaptive management of the MPA Network. The Monitoring Program is carried out by multiple state partners, is scientifically rigorous, addresses the mandates of the MLPA, and informs other California coastal and ocean policy priorities.

**Policy and permitting.** Consistent policy and permitting is a critical component of MPA Network governance. The Management Program uses scientific data and expert knowledge to inform management recommendations to the Commission to aid in their rule-making decisions. For example, goal three of the MLPA states that the MPA Network provide study opportunities in marine ecosystems that are subject to minimal human disturbance. However, unregulated research activities have the potential to negatively impact marine environments. To address these potential adverse effects, in 2017 CDFW began utilizing an ecological framework (Saarman et al. 2018) for informing scientific collecting permitting decisions in MPAs.

2. <https://www.wildlife.ca.gov/>

3. <http://www.fgc.ca.gov/>

4. <http://www.opc.ca.gov/>

5. <http://www.opc.ca.gov/programs-summary/marine-protected-areas/partnerships/>

6. [http://www.opc.ca.gov/webmaster/ftp/pdf/docs/mpa/APPROVED\\_FINAL\\_MPA\\_Partnership\\_Plan\\_12022014.pdf](http://www.opc.ca.gov/webmaster/ftp/pdf/docs/mpa/APPROVED_FINAL_MPA_Partnership_Plan_12022014.pdf)



## MPA Governance

MPA governance in California is rooted in a partnership-based approach to facilitate design, implementation, and adaptive management of the MPA Network to achieve the goals of the MLPA (CDFW 2016). The Commission is the primary regulatory decision-making authority for regulations related to California's MPAs. CDFW implements and enforces the regulations set by the Commission, and is the lead managing agency for the MPA Network. OPC is responsible for the direction of policy for California's MPAs.

By tapping into the specialized knowledge of partners at other state and federal agencies, California Native American Tribes, non-governmental organizations, academic institutions, and fishing communities, CDFW and OPC leverage existing capacity to help ensure efficient, cost-effective management of the MPA Network. In 2014, the Secretary for Natural Resources directed OPC staff to convene the Leadership Team to encourage effective communication and collaboration among these partners. The Leadership Team is a standing advisory body made up of state, federal, nonprofit, and Tribal members that ensures communication and collaboration among entities that have regulatory authority, responsibility, or interests related to California's MPA Network. By building and maintaining active partnerships, the Leadership Team works to engage a diverse range of stakeholders in the management of the MPA Network. In particular, the Leadership Team plays a critical role in helping to support the MPA Monitoring Program.

## Partnership with California Native American Tribes

Both informal discussions and formal Tribal Consultation are important to the ongoing management of MPAs (CDFW 2016). As the traditional users and stewards of California's marine resources, California Native American Tribes are particularly important to the success of the Management Program. The US Government recognizes some Native American Tribes as separate and independent sovereign nations, and these federally recognized Tribes have trust relationships with the US Government and interact with it on a government-to-government basis. Non-federally recognized Tribes also play an important role in natural resource management. The State of California does not have a formal trust relationship with federally recognized or non-federally recognized Tribes. However, the state is committed to engaging in meaningful collaborations with California Native American Tribes.

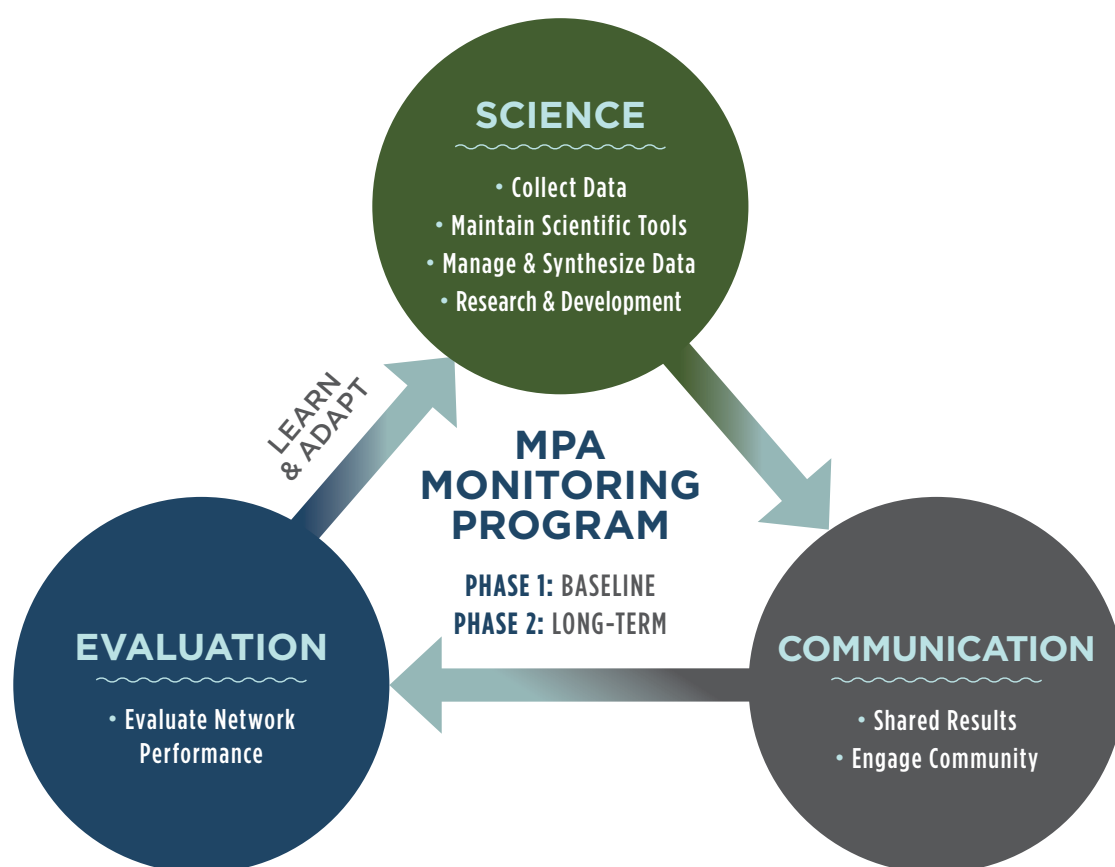
Guided by the Executive Order B-10-11 established by Governor Edmund G. Brown Jr. and demonstrating California's commitment to improving collaboration and communication with Tribes, CDFW, OPC through the California Natural Resources Agency<sup>7</sup> (CNRA), and the Commission developed and adopted formal Tribal Consultation policies to enable California Native American Tribes to provide meaningful input for natural resource management.

7. <http://resources.ca.gov/>

## 2. MPA Monitoring Program

**SCIENTIFICALLY SOUND MPA MONITORING** is a critical component of the adaptive management process required by the MLPA (CDFW 2016). The state and its partners have designed a scientifically rigorous and robust Monitoring Program. The Monitoring Program draws from best available science regarding MPA performance evaluation and uses best practices in science, policy, and management, recognizing the uniqueness of California's marine environment (CDFW 2016).

The Monitoring Program consists of a two-phase approach. Phase 1, which was completed in early 2018, focused on regional baseline monitoring and established a "snapshot" of ecological and socioeconomic conditions near the time of MPA implementation. Phase 2 is focused on statewide long-term monitoring to track changes in selected performance metrics inside and outside MPAs over time. Underpinning both phases are three core elements necessary for generating meaningful monitoring results: science, communication, and evaluation (Figure 2).



**FIGURE 2:** Science, communication, and evaluation elements that help inform adaptive management of California's MPA Monitoring Program.

## 2.1 Phase 1: Regional Baseline Monitoring

Regional baseline monitoring established a comprehensive snapshot of ecological and socioeconomic conditions at or near the time of MPA implementation in each of four planning regions across California's coast (Table 2). Baseline monitoring projects were guided by regional priorities funded in each region through a competitive peer review process, and covered eight habitats and two human uses, guided by recommendations from the MLPA Science Advisory Team (SAT) during the MPA design and siting

process (CDFW 2008, MLPA SAT 2008, 2009, 2011, White et al. 2013):

- Rocky Intertidal
- Kelp and Shallow Rock (0-30 m)
- Mid-depth Rock (30-100 m)
- Soft-bottom Intertidal and Beach
- Soft-bottom Subtidal (0-100 m)
- Deep Ecosystems and Canyons (>100 m)
- Nearshore Pelagic (i.e., the water column within state waters 0-3 nm)
- Estuaries
- Consumptive Human Use
- Non-consumptive Human Use

**TABLE 2:** MPA baseline monitoring regions, number of projects, data collection period, analysis and sharing information period, and year of the initial regional 5-year management review.

COASTAL REGION	NUMBER OF PROJECTS	DATA COLLECTION PERIOD	ANALYZE, SYNTHESIZE, & SHARE INFORMATION	5-YEAR MANAGEMENT REVIEW
<b>CENTRAL</b> <i>(Pigeon Pt. to Pt. Conception)</i>	5	2007 - 2010	2010 - 2013	2013
<b>NORTH CENTRAL</b> <i>(Alder Creek to Pigeon Pt.)</i>	11	2010 - 2012	2012 - 2016	2016
<b>SOUTH</b> <i>(Pt. Conception to US/Mexico Border)</i>	10	2011 - 2013	2013 - 2017	2017
<b>NORTH</b> <i>(California/Oregon border to Alder Creek)</i>	11	2013 - 2016	2016 - 2018	2018

Data and results are found in raw data packages and individual technical reports for each funded project, as well as in summary "State of the Region" reports (Table 3). Baseline products informed an initial 5-year management review of regional MPA implementation, and provide a benchmark against which future changes can be measured. All baseline monitoring data and reports can be accessed at <https://data.cnra.ca.gov>.





**TABLE 3:** MPA baseline products by coastal region.

COASTAL REGION	PRODUCT
<b>NORTH</b>	Baseline Monitoring Projects <sup>8</sup> State of the Region Report <sup>9</sup> CDFW's Management Review <sup>10</sup>
<b>NORTH CENTRAL</b>	Baseline Monitoring Projects <sup>11</sup> State of the Region Report <sup>12</sup> CDFW's Management Review <sup>13</sup>
<b>CENTRAL</b>	Baseline Monitoring Projects <sup>14</sup> State of the California Central Coast Report <sup>15</sup> CDFW's Management Review <sup>16</sup>
<b>SOUTH</b>	Baseline Monitoring Projects <sup>17</sup> State of the California South Coast Report <sup>18</sup> CDFW's Management Review <sup>19</sup>

8. <https://caseagrant.ucsd.edu/news/north-coast-marine-protected-areas-project-summaries>

9. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=151828&inline>

10. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=155713&inline>

11. <https://caseagrant.ucsd.edu/news/north-central-coast-marine-protected-areas-project-summaries>

12. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=133100&inline>

13. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=133098&inline>

14. <https://caseagrant.ucsd.edu/news/central-coast-marine-protected-areas-project-summaries>

15. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=133101&inline>

16. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=80499&inline>

17. <https://caseagrant.ucsd.edu/news/south-coast-mpa-baseline-program>

18. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=144357&inline>

19. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=144356&inline>

## 2.2 Phase 2: Statewide Long-Term Monitoring

Statewide long-term monitoring focuses on gathering the required information necessary to assess MPA Network performance. Major components supported or identified to date include:

- Maintaining or expanding the geographic scope of data collection in selected key habitats and on human uses,
- Maintaining the capacity of CDFW to collect data through scientific equipment upgrades,
- Supporting the development of an Open Data Platform<sup>20</sup> (ODP), a comprehensive, publicly accessible information management system hosted by CNRA and connected to existing data platforms, and
- Conducting integrated analyses across sites, regions, and scientific disciplines to inform adaptive management.

This document informs next steps for long-term monitoring. It does this by aggregating and synthesizing work from the MPA design and siting process, baseline monitoring projects, and additional scientific study in California on MPAs over the past decade, as well as incorporating novel, quantitative, and expert informed approaches. ***This Action Plan prioritizes metrics, habitats, sites, species, and human uses for long-term monitoring to inform the evaluation of the MPA Network.*** The primary intended audiences include existing and potential partners interested in applying for funding to conduct MPA monitoring, as well as other entities with mandates, or interests relating to California's MPA Network. This is a living document and may be updated as needed to ensure the latest understanding of MPA Network performance evaluation is reflected in the priorities of the Monitoring Program.

### Funding for Long-Term Monitoring

A variety of funding sources, disbursement mechanisms, and administrative processes have been identified to ensure the successful implementation of the Monitoring Program. Currently, the Monitoring Program receives a \$2.5 million annual General

Fund appropriation into the Secretary for Natural Resources budget that is designated for MPA monitoring. This amount is supplemented with other types of funds when available, but these monies are not available every year and the amount available for the Monitoring Program fluctuates annually. OPC's Once-Through Cooling (OTC) Interim Mitigation Program identifies research to determine the degree to which the MPA Network is mitigating OTC impacts as one of the designated uses for those funds<sup>21</sup>. The OTC Program will sunset in 2029. Payments to the program will decrease each year as power plants come into compliance with the policy or shut down. A general portfolio of potential funding disbursement mechanisms has been identified that will inform and enable state investments to strategically target maximum cost-effectiveness, transparency, and efficiency across the breadth of activities within the Monitoring Program (Appendix A). The MPA Management Program's adaptive management process includes a decadal management review, the first of which is anticipated in 2022 (marking 10 years since statewide MPA Network implementation in 2012; CDFW 2016). Some key elements of the process, specific to funding the Monitoring Program prior to the first review in 2022, are discussed below.

### CURRENT TIMELINE

#### November 2018

Open call for proposals released

#### January 2019

Scientific peer review of submitted proposals

#### February 2019

Recommend proposals brought to OPC

#### March – May 2019

Approved project agreements executed

#### April 2019 – 2021

Data collection and analyses

#### December 2022

Ten-year management review brought to Commission

20. <https://data.cnra.ca.gov/>

21. Dawson C.L., Worden S., Whiteman L. 2016. Once-Through Cooling Mitigation Program Policy and Science Framework Linking California's Marine Protected Area Network to OTC Impacts. [http://www.opc.ca.gov/webmaster/\\_media\\_library/2016/10/FINALScience\\_PolicyFramework\\_LinkingMPAstoOTCMitigation\\_8.30.16.pdf](http://www.opc.ca.gov/webmaster/_media_library/2016/10/FINALScience_PolicyFramework_LinkingMPAstoOTCMitigation_8.30.16.pdf)

## RESEARCH CONSORTIUMS

The MPA Network spans more than 1,100 miles along California's coastline, excluding San Francisco Bay. Research programs are often clustered around academic institutions, and many focus on conducting monitoring studies within their local geographic region (see monitoring dashboard<sup>22</sup> for more information). Few monitoring programs have a statewide focus and fewer still work at broader scales. The Monitoring Program supports consortiums of principal investigators (PIs), often from multiple institutions or organizations, to conduct some elements of the Monitoring Program. Administratively, a single lead-PI and their associated institution/organization submits a single proposal during open call periods that identifies their geographically distributed co-PIs as sub-awardees. If a proposal is successful, the lead-PI will be awarded funds and they are responsible for using their institution's accounting practices to disburse funds to their co-PIs. In practice to date, most of the consortium awards have been organized around habitat types along the coast, e.g., Rocky Intertidal, Kelp and Shallow Rock (0-30 m), Mid-depth Rock (30-100 m). This prevents the state from absorbing the administrative burden of awarding monitoring projects on a regional basis, which significantly increases the number of overall awards being administered and allows for a more efficient leveraging of existing resources. Another major advantage of this approach is collaborators can share training resources and equipment across the state, when feasible, to increase efficiency and keep costs as low as possible.

## OPEN CALL COMPETITIVE PROCESS

The state will, in most cases, release Requests for Qualifications (RFQs) soliciting proposal bids for monitoring projects. An RFQ lays out a highly specific project plan and is appropriate for many of the key habitat types that already have very clearly defined consensus approaches to monitoring the key metrics (see section 2.3). Long-term monitoring RFQs and submissions will undergo full scientific peer review. Successful applicants will enter into an agreement with the state and will be funded in arrears by reimbursement. Reimbursements will require ongoing written progress updates and a percentage of the total award (usually 10%) will be

held back and released upon the submittal of all the required deliverables delineated in the agreement. The RFQ process will last a total of 12-14 weeks plus time for agreement execution. Steps include an open call period (4-6 weeks), peer review (4 weeks), applicant revisions based on reviewer comments (1-2 weeks), and final state review and decisions on recommended projects to fund (2 weeks). Although most open calls will likely be for new RFQs, other funding mechanisms identified in Appendix A can be deployed at any time as appropriate. For instance, specific questions regarding key habitats without clearly defined consensus approaches may be considered through Expressions of Interest (EOI).

## Incorporating Existing Approaches

The Monitoring Program utilizes a partnership-based approach to leverage existing capacity. This approach has established a foundation for generating novel scientific information, tools, and strategies through partnerships with academic institutions, local, state, Tribal and federal governments, citizen science, other organizations, fishermen, and others across the state and beyond (CDFW 2016). For example, CDFW, OPC, and the Commission collaborated with over 60 organizations to conduct comprehensive baseline monitoring across all four coastal planning regions from 2007– 2018. Moving forward, the Monitoring Program will continue to identify opportunities to align monitoring approaches to leverage resources, capacity, and expertise.

To enhance our understanding of the magnitude of ocean monitoring and research along California's coastline, an interactive dashboard was developed to explore who is monitoring what and where. The dashboard is the result of information collected from a survey conducted following baseline monitoring in each of the four planning regions and represents a key step in planning for long-term monitoring. Survey participants included government agencies, non-government organizations, and academics involved in conducting or managing monitoring efforts.

22. <http://oceanspaces.org>



In 2018, 134 entities were actively monitoring and researching at 8,228 sites off California's coast. Some of these entities have long-term monitoring sites that may help fill data gaps and address data collection limitations related to the Monitoring Program. It should be noted that not all the projects described in the survey are on-going or monitoring the selected sites, metrics, and indicators identified by the Monitoring Program.

### EXAMPLES OF IMPORTANT EXISTING PROGRAMS

The programs below have been in existence for often over a decade and are contributing data to statewide long-term monitoring. Though not a comprehensive list, the following programs include extended time series or novel monitoring of under-sampled metrics (e.g., human use metrics) that can contribute to long-term MPA monitoring in California.

- Multi-Agency Rocky Intertidal Network (MARINe)**  
 Established in the 1980s, MARINe<sup>23</sup> is a partnership of agencies, universities, and private research groups working together to collect data in rocky intertidal habitats. Surveys by MARINe partners follow standardized protocols and occur throughout the year at over 200 sites ranging from Southeast Alaska to Mexico, with more than 187 in California. With over 20-30 years of data at some California sites, long-term data will be invaluable to assessing MPA effectiveness, performance, and network connectivity.
- Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO)**  
 Established in 1999, PISCO<sup>24</sup> is a long-term, ecosystem-based scientific monitoring program involving marine scientists at four universities along the U.S. West Coast. The monitoring program was designed to enhance understanding of the California Current Large Marine Ecosystem (CCLME), with research focusing on physical oceanographic conditions of the coastal ocean (5-10 km from shore and less than 25 m deep), as well as the ecology of kelp forests and rocky shorelines. PISCO's broad-scale research, monitoring, data management,

training, and outreach will continue to improve the understanding of how MPAs and surrounding areas respond to long-term protections.

- National Science Foundation (NSF) Long-Term Ecological Research (LTER)**  
 In 1980, to address ecological questions that cannot be resolved with short-term observations or experiments, NSF established the LTER program.<sup>25</sup> This program has designated specific sites to represent major ecosystem types or natural biomes, with two in southern California. The Santa Barbara Coastal LTER<sup>26</sup> project was established in 2000 and investigates the relative importance of land and ocean processes in structuring giant kelp forest ecosystems in the Santa Barbara Channel. The California Current Ecosystem LTER<sup>27</sup> project was established in 2004, and focuses on the oceanographic mechanisms leading to changes and dynamics of the pelagic ecosystem. Both sites have the potential to contribute greatly to our understanding of long-term change because of spatial protection.
- California Cooperative Oceanic Fisheries Investigations (CalCOFI)**  
 Established in 1949 to study ecological aspects of the sardine population crash, CalCOFI<sup>28</sup> is a partnership between CDFW, NOAA, and Scripps Institution of Oceanography that today focuses on the study of the marine environment off the coast of California through data collection on a wide array of marine indicators. CalCOFI conducts four seasonal oceanographic cruises a year to collect hydrographic and biological data in waters out to 300 nautical miles (nm) at various set stations from San Diego to Point Arena that are designed to improve the overall understanding of the fluctuations and long-term changes of the CCLME through continuous investigation.

23. <https://www.eeb.ucsc.edu/pacificrockyintertidal/index.html>

24. <http://www.piscoweb.org/>

25. <https://lternet.edu/>

26. <http://sbc.lternet.edu/>

27. <http://cce.lternet.edu/>

28. <http://calcofi.org/>

- **Integrated Ocean Observing System (IOOS)**

Created in 2001, IOOS<sup>29</sup> is a national-regional partnership intended to integrate ocean observing systems to enable NOAA and partners to provide new tools and forecasts to improve safety, enhance the economy, and protect the environment through improved ecosystem and climate understanding. California waters are divided into two IOOS regions, the Southern California Coastal Ocean Observing System (SCCOOS) and the Central and Northern California Ocean Observing System (CeNCOOS). Created in 2002, SCCOOS<sup>30</sup> is a regional component of the IOOS that works with local, state, and federal agencies to provide scientific data and information to inform decision making and to understand the changing Southern California coastal ocean conditions. SCCOOS activities include marine operations, coastal hazards, climate variability and change, and ecosystems, fisheries, and water quality in waters from Point Conception south to the Mexico border. Since 2004, CeNCOOS<sup>31</sup> has been regional partner with IOOS to develop long-term environmental conditions monitoring (e.g., water quality, productivity, and connectivity) to support MPA management in waters from the California/Oregon border south to Point Conception. CeNCOOS activities include scientific and technical expertise in ocean surface circulation measurements, shore stations that measure biological conditions, atmospheric and oceanographic forecasting, ocean acidification monitoring, seafloor mapping, and data serving.

- **U.S. National Park Service Kelp Forest Monitoring (KFMP)**

Channel Islands National Park established the Kelp Forest Monitoring Program<sup>32</sup> (KFMP) in 1982 to collect baseline data on the Park's kelp forest ecosystems. The protocol was formally adopted in 1987 and two formal reviews and revisions of monitoring protocol have occurred since. This is now one of the longest continuous datasets on the nearshore ecosystem in California and provides baseline data prior to the 2003 MPA establishment at the Northern Channel Islands to compare against for context. Each year,

KFMP divers collect size and abundance data for algae, invertebrates, and fish along permanent transects. Currently 33 sites are surveyed annually, including 15 sites within the Northern Channel Islands MPAs and their associated reference sites. Information from the KFMP program has been used alongside PISCO data to detect changes in size and density of fishes, invertebrates, and algae in response to MPAs.

- **Citizen Science Programs**

The capacity for citizen science to play a role in MPA monitoring is increasing, as multiple programs improve and standardize their sampling methods to meet traditional scientific standards. Citizen science can take many forms, from casual observations of marine life onshore to organized surveys of offshore reefs. Though citizen science is not a substitute for academic research, when suitable, citizen science has the potential to generate large amounts of reliable, cost-effective data while simultaneously creating more informed and invested communities.

- **Reef Check California (RCCA)**

Since 2005, RCCA<sup>33</sup> has conducted a statewide program that monitors and reports on subtidal rocky reefs throughout California. Trained volunteer SCUBA divers conduct surveys of fish, algae, and invertebrate species and document underwater topography. RCCA has established high expectations for volunteer entry, including extensive training requirements and a hierarchy of survey skills that develop over time through continued participation in the program. Due to the rigorous training requirements, RCCA has shown its data collection standards to be on par with those collected by academic and agency scientists, and as such received funding to collect data as part of regional baseline monitoring projects.

29. <https://ioos.noaa.gov/about/about-us/>

30. <https://ioos.noaa.gov/regions/sccoos/>

31. <https://ioos.noaa.gov/regions/cencoos/>

32. <https://science.nature.nps.gov/im/units/medn/monitor/kelpforest.cfm>

33. <http://www.reefcheck.org/california/ca-overview>

- **California Collaborative Fisheries Research Program (CCFRP)**

CCFRP<sup>34</sup> is a partnership of researchers and local fishing communities interested in fisheries sustainability. Established in 2007 as part of baseline monitoring on California's central coast, the program uses local charter boats to take volunteer anglers out to conduct fishery-independent, hook-and-line, catch and release surveys of offshore rocky reefs inside and outside MPAs. Volunteer anglers participate in research cruises under the oversight of scientists who are on hand to help with measurements, tagging, and fish identification. The program has now expanded statewide. Researchers attribute the success of this program to its collaborative nature, which helps to create an open and collaborative dialogue between scientists and recreational fishermen.

- **Long-term Monitoring Program and Experiential Training for Students (LiMPETS)**

Created in 2002, LiMPETS<sup>35</sup> is a youth-based citizen science program that works primarily with middle and high school students to collect data from more than 60 sites across California's coast. Volunteers are taught to identify, count, and measure marine species in rocky intertidal and sandy beach habitat. Participation in the LiMPETS program help increase students' understanding of California's coastal ecology while also providing publicly accessible, long-term data.

- **MPA Watch**

MPA Watch<sup>36</sup>, established in 2010, monitors both consumptive and non-consumptive human use of coastal resources. The program is overseen by ten different organizations, which collectively train and support volunteers to collect data on how coastal usage is changing as a result of MPA implementation. All volunteers utilize standardized data collection and reporting methods, which helps to increase the scientific rigor of the program. MPA Watch began collaboration with the State in 2013.

While established long-term monitoring programs will be of vital importance in tracking the MPA Network's progress towards meeting the goals of the MLPA, additional programs may also play important roles.

- **Mid-depth (30-100 m) and deep rocky reefs (>100 m) visual surveys**

Mid-depth and deep rocky reefs comprise more than half of the rocky reef habitat within California's jurisdictional waters (0-3 nm from shore and around offshore islands and rocks). CDFW has performed extensive surveys inside and outside of MPAs using a remotely operated vehicle (ROV) since 2004. Recently, CDFW collaborated with Marine Applied Research and Exploration<sup>37</sup> (MARE) to survey 148 locations in a three-year, statewide effort revisiting historic baseline monitoring sites and adding many new locations. Synthesis of this data set with fine scale seafloor mapping products, through the use of spatial models, has demonstrated ability to quantify fish and invertebrates across these reef systems. Ongoing development of these techniques and refinement of sampling methodology will provide the ability to detect change in these important ecosystems. A series of workshops to explore the full range of sampling methods used in this habitat were held in 2017. The workshop focused on using expert input to develop consensus recommendations on metrics, sites, and indicators which will be used to inform (along with other emerging analyses), long-term monitoring in this habitat (Appendix E).

- **Seabird surveys**

While seabirds are generally highly migratory, during breeding and nesting season, many species are central place foragers requiring frequent returns to their nests for roosting or feeding young throughout the day. This behavior dictates a more limited foraging range that could

34. <https://www.mml.calstate.edu/ccfrp/>

35. <http://limpets.org/>

36. <http://www.mpawatch.org/>

37. <https://www.maregroup.org/>

benefit from nearby MPAs providing reduced competition with humans for prey resources. Continued monitoring of seabirds and their utilization of special closures and MPAs may potentially provide an indirect approach to study nearshore fish and invertebrate recruitment at spatial scales relevant to MPA establishment (McChesney & Robinette 2013, Robinette et al. 2015, Golightly et al. 2017, Robinette et al. 2018).

### INCORPORATING TRADITIONAL ECOLOGICAL KNOWLEDGE

Another important component of long-term monitoring is the incorporation of Traditional Ecological Knowledge (TEK). Since time immemorial, California Native American Tribes have stewarded and utilized marine and coastal resources in the region. The foundation of their management is a collective storehouse of knowledge about the natural world, acquired through direct experience and contact with the environment, and gained through many generations of learning passed down by elders about practical, as well as, spiritual practices (Anderson 2005). This knowledge, which is the product of keen observation, patience, experimentation, and long-term relationships with the resources, today is commonly called TEK (Anderson 2005).

While no single definition of TEK is universally accepted, it has been described as “a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” (Berkes 1999). Traditional Knowledge (TK) and Indigenous Traditional Knowledge (ITK) encompasses TEK, science, and other relevant information from Tribes. Many California Native American Tribes continue to regularly harvest marine resources within their ancestral territories and maintain relationships with the coast for ongoing customary uses.

The Monitoring Program is committed to learning from and collaborating formally with California Native American Tribes on ways to integrate TEK into the long-term monitoring of MPAs. One of the baseline monitoring projects for the North Coast MPAs, *Informing the North Coast MPA Baseline: Traditional Ecological Knowledge of Keystone Marine Species and Ecosystems*, provided recommendations (Box 2) on management and policy that could act as a springboard for conversation.



### BOX 2: North Coast Keystone Species

The North Coast TEK baseline project identified five keystone species of cultural importance to several North Coast Tribes including abalone, clams, mussels, seaweed, and smelt. These species are represented as key indicators for long-term monitoring on the North Coast, and species from other regions could be added once identified and discussed with respective Tribal nations.





## 2.3 Selection of Key Measures and Metrics, Sites, and Species

The MLPA Master Plan for MPAs directed the development of evaluation questions to help guide monitoring and adaptive management. Informed by existing science and policy, this broad list of evaluation questions (Appendix B) represent the key elements regarding the design, performance, and functioning of the MPA Network in relation to the goals of the MLPA. In order to provide a contextual framework for the key measures and metrics, sites, and species identified in this section, a sub-set of these evaluation questions are shown below as examples:

- **GOAL 1:** Do indicator species inside of MPAs differ in size, numbers, and biomass relative to reference sites?
- **GOAL 2:** Do California Monitoring Program indicator species, including those of economic importance, experience positive population level benefits (e.g. increase in abundance, larger size, increased reproductive output, increased stock size) in response to MPA implementation?
- **GOAL 3:** How are the frequency of non-consumptive use, knowledge, attitudes, and perceptions regarding the MPAs changing over time?
- **GOAL 4:** Have endangered species and culturally significant species benefited from the presence of California's MPAs?

- **GOAL 5:** How has the level of compliance changed over time since the MPAs were first implemented and what factors influence variation in compliance within and among MPAs?
- **GOAL 6:** How do other stressors impact the performance of MPAs over time (e.g., water quality, oil spills, desalination plants, ocean acidification, sea level rise)?

Inquiry into the additional evaluation questions listed in Appendix B by Monitoring Program partners is encouraged. It is important to note that the overarching questions listed above in many cases will provide insights into the other evaluation questions listed in Appendix B.

The priorities selected below are meant to guide the Monitoring Program. The Action Plan purposefully does not address the types of data collection methods or analytical approaches that should be used to evaluate the performance of California's MPA Network because methods and analytical approaches are rapidly evolving. This approach will help ensure our scientific partners have the ability, in collaboration with the state through the proposal solicitation process, to use their expertise to select the most effective and efficient procedures. The Monitoring Program will continue to incorporate opportunities to explore emerging methods and analytical approaches through proposal solicitations focused on pilot or research and design studies as appropriate.

## Key Performance Measures and Metrics

To meet California's adaptive management objectives (CDFW 2016), a prioritized list of key measures and metrics have been selected to advance understanding of conditions and trends across the MPA Network as well as inform network evaluation<sup>38</sup>. Decades of MPA performance studies from around the world indicate that these ecological, physical, chemical, human use, and enforcement measures and metrics are the most important for evaluating and interpreting MPA performance (e.g., Claudet et al. 2008, Lester & Halpern 2008, Cinner et al. 2009, Caselle et al. 2015, Cinner et al. 2016, Giakoumi et al. 2017).

### Species-level

- Abundance
- Density/cover
- Size/age frequency
- Biomass

### Community-level

- Functional diversity--tracking the population dynamics of those species and organismal traits that influence ecosystem functioning
- Stability

### Physical

- Temperature
- Depth
- Substrate (e.g., rock or sediment size, type, and rugosity)
- Wave exposure

### Chemical<sup>39</sup>

- pH
- Total alkalinity
- Dissolved oxygen

### Human Use<sup>40</sup>

- **Commercial Passenger Fishing Vessel**
  - Annual license renewal and vessel registration
  - Port of departure
  - Number of anglers
  - Target species
  - Trip length
  - Fishing location
  - Average price paid per angler
  - Number and pounds of fish caught by species

- Number of crew on trip
- Effort and catch per unit effort (CPUE)
- Annual operating costs
- Number of crew employed
- **Commercial Fisheries**
  - Annual license and vessel renewal
  - Number of fishermen making landings
  - Landings: catch, price, and revenue by species
  - Gear type
  - Landings port location
  - CPUE
  - Harvest location
  - Annual operating costs
  - Number of crew employed
- **Recreational Fisheries**
  - License purchases
  - Catch amount
  - Catch location
  - Catch effort
  - Type of gear/mode
- **Coastal Recreation and Tourism**
  - Location of residence
  - Demographic information (*i.e.* age, gender, education, etc. See Appendix D for further detail)
  - Income
  - Employment status
  - Frequency and type of visit
  - Location of visit
  - Type of activities
  - Trip expenditures
- **Enforcement (location specific)**
  - Patrol hours
  - Citations
  - Warnings
  - Cal TIPs received related to potential MPA violations<sup>41</sup>

38. Proposal solicitations will contain additional details on priorities.

39. Note total maximum daily load (TMDL) and other water quality parameters are addressed in complementary monitoring programs lead by the State and Regional Water Quality Control Boards

40. Appendix D contains a detailed plan for human use monitoring and proposal solicitations will contain additional details on priorities. It is important to note, existing data collection efforts like landing receipts, logbooks, report cards, and citizen science monitoring provide much of the required data to track key human use trends. Additional monitoring will be required and included in the Monitoring Program.

41. CalTIP (Californians Turn In Poachers and Polluters) is a confidential secret witness program that encourages the public to provide CDFW with factual information leading to the arrest of poachers and polluters. 1-888-334-CalTIP (888-334-2258).

The common approach to MPA performance evaluation is to compare the responses of these metrics inside and outside MPAs over time to distinguish responses to MPA protection from natural temporal variation (Lester et al. 2009, Fox et al. 2014, Caselle et al. 2015, Soykan & Lewison 2015). ***State-funded long-term monitoring projects will compare changes in the above performance measures inside and outside MPAs over time.*** Some projects may not measure all the key measures and metrics but where feasible, it will be important to measure as many of the key measures and metrics as possible at priority sites and their associated reference sites.

## Index Site Selection

### BIOREGIONS FOR LONG-TERM MONITORING

This Action Plan identifies three bioregions for long-term monitoring: the north coast (California/Oregon border to San Francisco Bay, including the Farallon Islands), the central coast (San Francisco Bay to Point Conception), and the south coast (Point Conception to the U.S./Mexico border, including the Channel Islands) (Figure 3). It is important to note these bioregions are not the same as the four historical MLPA planning regions and subsequent baseline monitoring regions. The four MLPA planning regions were identified in order to allow for a design approach that could reasonably take into account the unique character of different regions in developing the statewide network of MPAs (CDFW 2016), while the three bioregions in the Action Plan are in large part designated based on data collected during baseline monitoring that identified clusters of similar biota, ecological communities, and key habitats.

### TIERED APPROACH

The MPA Network consists of 124 MPAs that span the state's entire 1,100-mile coastline including offshore islands, from the U.S./Mexico border to the California/Oregon border. It is both logistically and financially infeasible to monitor all marine species at all MPAs and their associated reference sites. This Action Plan prioritizes long-term MPA monitoring sites by identifying tiers: required (Tier I), secondary (Tier II), and tertiary (Tier III). These monitoring priority tiers, which are based on best available

science, will enable efficient data collection by researchers while still allowing for a broad evaluation of network performance by CDFW. A key advantage of the tiered priority groupings is providing managers and partners a discrete list of index sites to inform the performance evaluation of the MPA Network. State-funded long-term monitoring projects should prioritize the Tier I index sites that align with monitoring project methods. Tier I sites should provide the ability to infer observed conditions to the broader evaluation of Network performance. When feasible, projects are encouraged to monitor sites from Tier II and Tier III lists (Appendix F). Sites not identified in Tier I still play a critical role in the functioning of the Network.

The MLPA requires the MPA Network include a variety of marine habitats and communities to be represented and replicated across a range of depths and environmental conditions (FGC §2857(c)). Habitat type, complexity, and depth are all known to be important drivers of community structure (Allen et al. 2006, Love et al. 2009, Schiel & Foster 2015, Starr et al. 2015, Fulton et al. 2016). Subsequent analyses indicate that most of the habitats targeted by the MPA design and siting process were successful in achieving representation and replication targets (Young & Carr 2015). MPA index sites were prioritized based on scoring each of the 102 coastal and island MPAs against four defined criteria that evaluated different aspects of individual MPAs ensuring a good representation of multiple habitats in the selected sites. The four criteria used to determine site selection are based on the best readily available science, and serve as a starting point for determining whether the Network is meeting the six goals of the MLPA. However, within each of the criteria there are limitations that are noted.

Only one of the four quantitative methods, MPA design features, could be applied to the 22 estuarine MPAs. Therefore, to assign estuarine MPAs into one of three tiers, they were separated from coastal MPAs and only evaluated on their ability to meet the SAT recommended MPA design features. See Appendix F for tiered list of estuary index sites.

The scoring approach for each quantitative method are summarized below, with detailed methodology located in Appendix F.

### CRITERIA 1: MPA Design Features

During the MPA design and siting process, the MLPA SAT provided regional stakeholders with MPA science design guidelines, such as MPA size, level of protection, and habitat representation within MPAs. SAT guidelines also included identifying co-locating MPAs with existing water quality protection (e.g., Areas of Special Biological Significance (ASBS)) and areas that had historical protection as priorities. **MPAs that meet SAT guidelines are expected to realize more significant conservation benefits, and therefore should be prioritized for long-term monitoring.** All MPAs were scored against SAT guidelines as follows:

- **MPA size.** MPA size points = 2 if an MPA met the SAT recommended size of 18 square statute miles (sm<sup>2</sup>) or larger; MPA size points = 1 if an MPA met the SAT recommended minimum area of 9 sm<sup>2</sup>; MPA size points = 0 if an MPA was smaller than the SAT recommended minimum area of 9 sm<sup>2</sup>.
- **Threshold of habitat representation and replication within an MPA.** MPAs received 1 point for each of 12 key habitats that met minimum size guidelines for representation/replication, and 0 points for key habitats that did not meet minimum size guidelines. See Appendix F, Table F1 for SAT-recommended minimum size guidelines by habitat.
- **Level of protection (LOP) within an MPA.** LOP points = Habitat threshold points \* LOP multiplier. See Appendix F, Table F2 for LOP multiplier values by habitat.
- **MPA Overlap with Areas of Special Biological Significance.** MPAs were assigned a point value from 0 to 1 representing percent overlap with ASBS, e.g. if ASBS overlapped with 72% of the MPA area, point value = 0.72.
- **MPA Overlap with historically protected area.** MPAs were assigned a point value from 0 to 1 representing percent overlap with historically

protected area, e.g. if historically protected area overlapped with 64% of the MPA, point value = 0.64. This point value was added to a second term representing protection, assigned 1 if the historical MPA prohibited all take and 0 if the historical MPA allowed take. The two terms were then summed for a final historical MPA points score.

Design scores were calculated as follows:

**Total Design Score = MPA size + habitat threshold + LOP + ASBS + Historical MPA points**

A key design metric outlined by the SAT during the MLPA planning process, spacing of MPAs, was not included in this criteria. There was uncertainty on how to properly score spacing guidelines for MPAs, and was therefore not included in the design score. However, the connectivity modeling done through the Regional Oceanographic Modeling System (ROMS, criteria 3) model helps to fill in this gap.

### CRITERIA 2: MPA Historical Monitoring

Responses of targeted fished species to MPA implementation can occur on the order of years to decades, and community responses tend to occur over longer time scales (Babcock et al. 2010, Caselle et al. 2015, Starr et al. 2015). Moreover, change in and of itself is not sufficient evidence of an MPA effect. The ability to compare MPA trends to both control (no MPA regulations yet other fishing regulations apply) reference sites and to periods where protection was absent is more informative. Hence historical monitoring efforts that uniformly and consistently conducted monitoring statewide prior to and following MPA implementation will allow for a more objective evaluation of MPA effects using 'before-after' and 'control-impact' (BACI) analyses. BACI design allows for controlling for the effects of temporal and spatial variation (e.g., recruitment variability in time, habitat variability in space), and coupled dynamics inside and outside MPAs (i.e., larval connectivity and adult spillover) (White et al. 2011).

For more informative and successful network evaluation, it is essential to prioritize MPAs with the longest possible time series of available data to allow for statistically robust BACI analyses - in other words, a greater understanding of change over time.



The following three ecosystem features and associated monitoring programs were assessed for historical monitoring:

- Rocky intertidal monitoring: MARINe biodiversity and fixed plot surveys
- Nearshore (0-30 m) subtidal kelp forest monitoring: PISCO and RCCA scuba surveys
- Mid-depth (30-100 m) ROV monitoring: CDFW/MARE

In order to offer an unbiased assessment of the statewide monitoring we used very specific criteria in order to include monitoring as part of “historical monitoring.” Specifically, the monitoring had to occur consistently throughout the state both before and after MPA implementation. There are a multitude of programs that offer long-term monitoring data (see section 2.2 “Examples of Important Existing Programs”), but were ultimately not included due to either temporal or spatial limitations. The approach to only include historical monitoring consistently conducted statewide limited the analysis to only rocky substrate programs. However, data collected by spatially limited survey programs such as the

National Park Service's KFMP at the Northern Channel Islands will be integrated in future analyses.

All non-estuarine MPAs were scored for level of historical monitoring according to the following rule: for each of the five monitoring programs, MPAs received a single point for an annual survey replicate conducted since the beginning of the monitoring program. As an example, Point Lobos SMR has been surveyed for biodiversity by MARINe in 2001, 2005, 2014, and 2017, so receives a point value of 4. These individual survey points for all five monitoring programs are then summed for an MPA to create an initial score. To account for the importance of monitoring multiple habitats over time, initial scores were multiplied by a “monitoring multiplier” that ranged from 0 to 3 representing the number of habitats, of the three listed above, that were monitored over the date range considered.

Historical monitoring scores were calculated as follows:

**Total Historical Monitoring Score = (rocky intertidal biodiversity + rocky intertidal fixed plot + PISCO kelp forest monitoring + RCCA kelp forest monitoring + mid-depth ROV) \* monitoring multiplier**



### CRITERIA 3: Habitat Based Connectivity

The spatial connectivity among sites through larval dispersal within the MPA Network was examined for key habitats excluding estuaries. This was accomplished using a set of outputs from the ROMS model coupled to a coastwide habitat model. ROMS is a four dimensional (space over time) general circulation model that is widely used by the scientific community for simulating currents and tracking particle movement throughout the CCLME. Connectivity is modeled by tracking the simulated movement of passive particles released into the ROMS-derived nearshore ocean circulation patterns through time.

The nearshore habitat model was applied to ROMS to “convert” particles into simulated larvae. The key simulation was done using a 30-60 day pelagic larval duration (PLD) period. PLDs represent the dispersal period for larvae and 30 to 60 days is a PLD representative for most non-algal species (algae have propagules like spores as a dispersal stage) along the California coast. Habitat extent (e.g. area of rock in a location) was used in two ways: (1) as proxy for number of larvae produced for species associated with a particular habitat in a source location, and (2) as a target for species associated with a particular habitat in a sink location. Hence, the coupled model tracks the larval production (source) from a given location to a settlement location (sink) within the modeling domain (U.S. West Coast). Sites were ranked based on their level of larval connectivity to areas both inside and outside MPAs. Areas that are highly connected (both sources and sinks) across habitats were prioritized.

Summed source and sink numbers served as connectivity scores for individual MPA sites. The scores represent an individual MPA’s level of connection to the entire California coastline. Sites that were significant sources and/or sinks received higher scores than areas that were less connected. It is important to note that the ROMS output can be considered a measure of connectivity among cells (locations) but should not be considered an estimate of one cell’s contribution of larvae (propagules) to other cells. This is because cells in ROMS grids are only characterized by oceanographic factors. To estimate the level of larval contribution, propagule production for donor cell, and amount of suitable habitat for receiving cells, high resolution habitat

information must be incorporated as a sub-model. For detailed information on ROMS methodology, habitat sub-model integration, and results, see Appendix F.

### CRITERIA 4: High Resolution Mapping of Recreational Fishing Effort

Recovery trajectories of fished populations following MPA implementation are highly dependent on the level of fishing mortality (F) to which those populations were subjected prior to protection (Micheli et al. 2004, White et al. 2013, Casselle et al. 2015, Starr et al. 2015, White et al. 2016). In other words, more pronounced ecological change should be expected inside MPAs where F was once high, and these sites should be prioritized for long-term monitoring. However, many populations lack direct estimates of F. For these populations, fishing effort can provide a reasonable proxy for F.

To attribute fishing effort at a spatial scale appropriate for determining influence on MPAs, data collected by CDFW’s California Recreational Fisheries Survey (CRFS) was used to calculate a relative index of fishing pressure by standardizing the sampled historical fishing effort (angler boat trips) over time and at sites, excluding estuaries, statewide. The analysis focused on recreational fishing trips targeting common nearshore rocky reef dwelling species (Appendix F). While there are many other types of target species and fishing modes, including commercial fisheries, the recreational private and rental boat support mapping at the high spatial resolution needed for this analysis. It presents an index of historical recreational bottom fishing pressure on MPAs prior to implementation, independent of fishing pressure from other modes of fishing. Results suggested that relative recreational fishing effort was concentrated in coastal areas surrounding major ports and surrounding island areas closest to these ports. Relative index numbers served as comparative fishing effort scores calculated within one-minute-by-one-minute areas (blocks) which were then summarized as maximum values for individual MPAs. For detailed information on methods, see Appendix F.

### INTEGRATING QUANTITATIVE METHODS

For each of the four criteria listed above, a rank-order list of MPAs within each bioregion was generated based on final scores (Appendix F, Table F3). The four





individual rank-order values were then averaged to generate a final integrated rank-order value. MPAs were sorted into tiers based on these values, with cutoffs for each tier varying by bioregion to ensure equal representation of the bioregion's MPAs within each of the three tiers (Table 4). For example, the 34 north coast MPAs were sorted so that 11 MPAs fell into Tier I, 11 MPAs fell into Tier II, and 12 MPAs fell into Tier III (Appendix F, Table F3).

**These rankings do not reflect the relative importance of a given MPA to the Network, but rather how well an MPA meets the specific quantitative criteria previously outlined.**

**Tier I MPAs** received the highest integrated rank-order values. They meet many of the design criteria needed for effective protection, are well connected components of the MPA network, and may have long time series of monitoring data and/or have experienced high historical fishing effort, which make these MPAs good candidates for detecting the potential effects of protection over time. Many of the MPAs on the Tier I index site list are state marine reserves, which were designated during the design process to be the backbone of the network (CDFW 2016), thus providing “an improved marine life reserve component consistent with the guidelines for the preferred siting alternative” (FGC §2853(c)(1)).

**Tier II MPAs** received the second-highest integrated rank-order values. Many of these MPAs ranked high in one or two of the quantitative methods and may be considered valuable index sites for more specific research questions. Tier II MPAs can be considered for long-term monitoring when funding permits, when an MPA cluster is split between tiers, or to help answer more regionally focused questions.

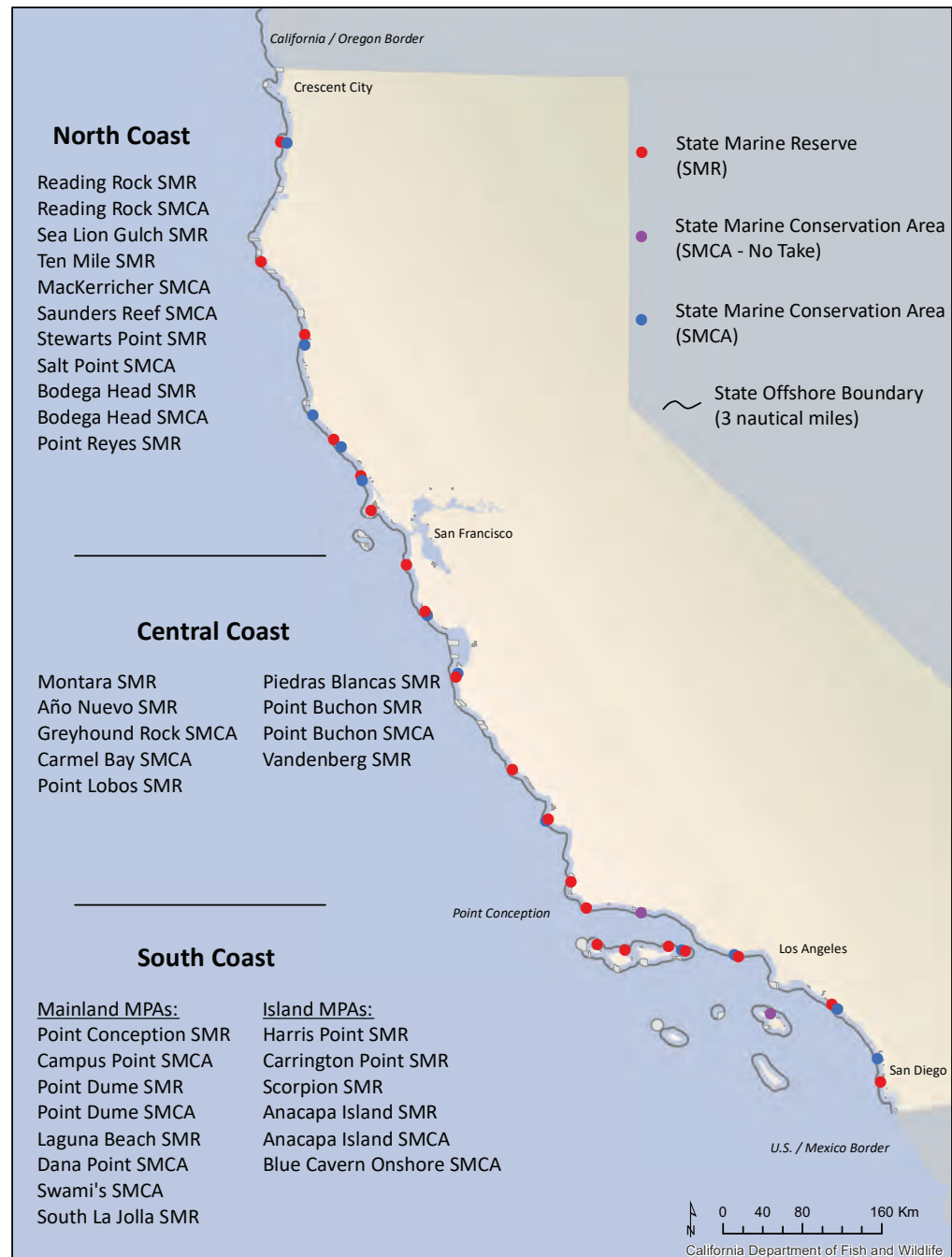
**Tier III MPAs** received the lowest integrated rank-order values. While valuable to the Network's integrity, many of these MPAs are limited for monitoring purposes at this time due to features such as smaller size, fewer representative habitats, are difficult to access, have limited or no long-term monitoring data, or have more allowable take within their boundaries. Tier III MPAs are recommended for long-term monitoring only to answer very specific or localized research questions.

**TABLE 4:** Recommended MPA tiers within each bioregion (MPAs listed north to south). Abbreviations: SMR = state marine reserve, SMCA = state marine conservation area, SMRMA = state marine recreational management area.

TIER I	TIER II	TIER III
<b>NORTH COAST</b>		
Reading Rock SMCA	Point St. George Reef Offshore SMCA	Pyramid Point SMCA
Reading Rock SMR	South Cape Mendocino SMR	Samoa SMCA
Sea Lion Gulch SMR	Big Flat SMCA	Mattole Canyon SMR
Ten Mile SMR	Double Cone Rock SMCA	Ten Mile Beach SMCA
MacKerricher SMCA	Point Cabrillo SMR	Russian Gulch SMCA
Saunders Reef SMCA	Point Arena SMR	Van Damme SMCA
Stewarts Point SMR	Point Reyes SMCA	Point Arena SMCA
Salt Point SMCA	Duxbury Reef SMCA	Sea Lion Cove SMCA
Bodega Head SMR	North Farallon Islands SMR	Del Mar Landing SMR
Bodega Head SMCA	Southeast Farallon Island SMR	Stewarts Point SMCA
Point Reyes SMR	Southeast Farallon Island SMCA	Gerstle Cove SMR
		Russian River SMCA
<b>CENTRAL COAST</b>		
Montara SMR	Pillar Point SMCA	Portuguese Ledge SMCA
Año Nuevo SMR	Natural Bridges SMR	Edward F. Ricketts SMCA
Greyhound Rock SMCA	Soquel Canyon SMCA	Lovers Point - Julia Platt SMR
Carmel Bay SMCA	Pacific Grove Marine Gardens SMCA	Carmel Pinnacles SMR
Point Lobos SMR	Asilomar SMR	Point Lobos SMCA
Piedras Blancas SMR	Point Sur SMR	Point Sur SMCA
Point Buchon SMR	Big Creek SMR	Big Creek SMCA
Point Buchon SMCA	Cambria SMCA	Piedras Blancas SMCA
Vandenberg SMR		White Rock SMCA
<b>SOUTH COAST</b>		
Point Conception SMR	South Point SMR	Kashtayit SMCA
Campus Point SMCA	Gull Island SMR	Naples SMCA
Harris Point SMR	Begg Rock SMR	Richardson Rock SMR
Carrington Point SMR	Santa Barbara Island SMR	Judith Rock SMR
Scorpion SMR	Point Vicente SMCA	Skunk Point SMR
Anacapa Island SMCA	Abalone Cove SMCA	Painted Cave SMCA
Anacapa Island SMR	Arrow Point to Lion Head Point SMCA	Footprint SMR
Point Dume SMCA	Long Point SMR	Blue Cavern Offshore SMCA
Point Dume SMR	Crystal Cove SMCA	Casino Point SMCA
Blue Cavern Onshore SMCA	Laguna Beach SMCA	Lover's Cove SMCA
Laguna Beach SMR	San Diego-Scripps Coastal SMCA	Farnsworth Onshore SMCA
Dana Point SMCA	Matlahuayl SMR	Farnsworth Offshore SMCA
Swami's SMCA	South La Jolla SMCA	Cat Harbor SMCA
South La Jolla SMR	Cabrillo SMR	Tijuana River Mouth SMCA

Although soft-bottom habitat makes up the majority (85%) of substrate along California's coast, MPA size and spacing design guidelines largely influenced designs which focused around the patchy distributions of limited rocky substrate (Saarman et al. 2013). *Because rocky substrate is associated with a higher density of fished species (Bond et al. 1999, Stephens et al. 2006), presence of highly productive kelp forests (Carr & Reed 2015, Schiel & Foster 2015), and significant human use (CDFW CRFS database 2005-present, CPFV logbook data), these areas are a primary focus for monitoring.* Tables 5 and 6 provide area and linear extent of habitats within each MPA.

**Prioritized sites in all Tiers include a variety of habitat types.**



**FIGURE 3:** Tier I MPA sites by Marine Protected Area Monitoring Action Plan sampling bioregion.

**TABLE 5:** Soft bottom habitats - Area or linear extent of coastline and percentage of available habitats within each bioregion - Tier I MPA sites. Abbreviations: SMR = state marine reserve, SMCA = state marine conservation area, SMRMA = state marine recreational management area.

MPA	BIOREGION	TOTAL AREA (mi <sup>2</sup> )	BEACHES (linear mi)	SOFT SUBSTRATE 0-30m (linear mi)	SOFT SUBSTRATE 30-100m (area mi <sup>2</sup> )	SOFT SUBSTRATE 100-3000m (area mi <sup>2</sup> )	ESTUARY (area mi <sup>2</sup> )	EELGRASS (area mi <sup>2</sup> )	COASTAL MARSH (area mi <sup>2</sup> )
READING ROCK SMCA	NORTH	11.96	2.96	2.82	3.77	0.00	0.00	0.00	0.00
READING ROCK SMR		9.60	0.00	0.00	9.43	0.00	0.00	0.00	0.00
SEA LION GULCH SMR		10.42	2.42	2.01	3.86	1.09	0.00	0.00	0.00
TEN MILE SMR		11.95	2.63	2.00	8.13	0.46	0.00	0.00	0.01
MACKERRICHER SMCA		2.48	4.40	0.00	0.06	0.00	0.00	0.00	0.01
SAUNDERS REEF SMCA		9.36	1.83	0.19	5.25	0.00	0.00	0.00	0.00
STEWARTS POINT SMR		24.06	0.89	0.18	21.89	0.00	0.00	0.00	0.00
SALT POINT SMCA		1.84	0.59	0.36	0.37	0.00	0.00	0.00	0.00
BODEGA HEAD SMR		9.34	1.32	0.26	5.38	0.00	0.00	0.00	0.00
BODEGA HEAD SMCA		12.31	0.00	0.00	6.31	0.00	0.00	0.00	0.00
POINT REYES SMR		9.55	8.38	2.07	1.20	0.00	0.00	0.00	0.00
MONTARA SMR	CENTRAL	11.81	2.14	0.95	7.75	0.00	0.00	0.00	0.01
AÑO NUEVO SMR		11.15	10.46	3.34	1.63	0.00	0.00	0.00	0.05
GREYHOUND ROCK SMCA		12.00	2.79	0.70	8.61	0.00	0.00	0.00	0.00
CARMEL BAY SMCA		2.20	3.09	1.58	0.36	0.07	0.02	0.00	0.02
POINT LOBOS SMR		5.50	2.10	1.36	2.05	0.33	0.00	0.00	0.01
PIEDRAS BLANCAS SMR		10.44	5.48	4.43	2.25	0.00	0.01	0.00	0.06
POINT BUCHON SMR		6.68	1.46	0.73	4.56	0.00	0.00	0.00	0.00
POINT BUCHON SMCA		12.19	0.00	0.00	8.11	3.02	0.00	0.00	0.00
VANDENBERG SMR		32.91	13.33	12.82	10.11	0.00	0.04	0.00	0.09
POINT CONCEPTION SMR	SOUTH	22.52	2.73	1.83	15.79	3.26	0.00	0.00	0.01
CAMPUS POINT SMCA		10.56	3.02	1.21	7.08	1.48	0.01	0.00	0.01
HARRIS POINT SMR		25.40	2.71	5.60	15.93	2.54	0.00	0.00	0.00
CARRINGTON POINT SMR		12.78	0.82	3.32	3.82	0.00	0.00	0.00	0.00
SCORPION SMR		9.64	0.89	2.28	4.88	0.18	0.00	0.01	0.00
ANACAPA ISLAND SMCA		7.30	0.19	1.74	6.21	0.18	0.00	0.00	0.00
ANACAPA ISLAND SMR		11.55	1.12	2.59	7.25	0.78	0.00	0.00	0.00
POINT DUME SMCA		15.92	4.09	3.14	5.95	7.18	0.00	0.00	0.00
POINT DUME SMR		7.53	2.77	1.81	1.07	4.30	0.00	0.00	0.00
BLUE CAVERN ONSHORE SMCA		2.61	1.66	1.89	0.79	1.43	0.00	0.00	0.00
LAGUNA BEACH SMR		6.72	3.48	3.65	2.82	1.79	0.00	0.00	0.00
DANA POINT SMCA		3.47	3.60	1.90	0.79	0.00	0.00	0.00	0.00
SWAMI'S SMCA		12.71	3.77	1.29	3.85	5.52	0.00	0.00	0.00
SOUTH LA JOLLA SMR		5.04	2.33	0.07	0.85	0.00	0.00	0.00	0.00
<b>NORTH BIOREGION TOTAL</b>		1618.90	391.45	227.31	820.08	75.93	60.84	13.31	136.88
<b>CENTRAL BIOREGION TOTAL</b>		1317.84	272.90	231.37	602.63	158.19	7.02	1.94	45.02
<b>SOUTH BIOREGION TOTAL</b>		2350.87	441.29	362.57	672.08	392.73	43.30	19.64	60.78

\*All miles are statute.

**TABLE 6:** Rocky habitats - Area or linear extent of coastline and percentage of available habitats within each bioregion - Tier I MPA sites. Abbreviations: SMR = state marine reserve, SMCA = state marine conservation area, SMRMA = state marine recreational management area.

MPA	BIOREGION	TOTAL AREA (mi <sup>2</sup> )	ROCKY INTERTIDAL (linear mi)	KELP (linear mi)	HARD SUBSTRATE 0-30m (linear mi)	HARD SUBSTRATE 30-100m (area mi <sup>2</sup> )	HARD SUBSTRATE 100-3000m (area mi <sup>2</sup> )
READING ROCK SMCA	NORTH	11.96	0.22	0.00	0.08	0.00	0.00
READING ROCK SMR		9.60	0.00	0.00	0.00	0.16	0.00
SEA LION GULCH SMR		10.42	2.32	0.19	0.56	2.86	0.12
TEN MILE SMR		11.95	6.77	2.43	1.10	0.50	0.00
MACKERRICHER SMCA		2.48	3.91	2.23	0.00	0.05	0.00
SAUNDERS REEF SMCA		9.36	4.29	1.11	2.52	1.65	0.00
STEWARTS POINT SMR		24.06	4.57	3.00	3.03	0.88	0.00
SALT POINT SMCA		1.84	4.03	3.84	2.46	0.54	0.00
BODEGA HEAD SMR		9.34	2.74	0.00	2.27	1.85	0.00
BODEGA HEAD SMCA		12.31	0.29	0.00	1.33	5.11	0.00
POINT REYES SMR		9.55	5.37	0.00	1.49	0.09	0.00
MONTARA SMR	CENTRAL	11.81	3.45	0.55	2.73	0.72	0.00
AÑO NUEVO SMR		11.15	6.86	0.24	1.83	0.79	0.00
GREYHOUND ROCK SMCA		12.00	3.39	0.08	2.38	0.03	0.00
CARMEL BAY SMCA		2.20	2.66	2.57	1.15	0.12	0.02
POINT LOBOS SMR		5.50	13.70	4.61	3.91	1.38	0.02
PIEDRAS BLANCAS SMR		10.44	6.09	4.18	2.10	0.54	0.00
POINT BUCHON SMR		6.68	2.71	1.85	2.59	0.47	0.00
POINT BUCHON SMCA		12.19	0.00	0.00	0.00	0.32	0.04
VANDENBERG SMR		32.91	10.21	0.63	1.45	0.08	0.00
POINT CONCEPTION SMR	SOUTH	22.52	3.13	1.29	1.84	0.32	0.10
CAMPUS POINT SMCA		10.56	1.37	1.62	1.85	0.04	0.00
HARRIS POINT SMR		25.40	8.18	2.30	1.96	2.40	0.25
CARRINGTON POINT SMR		12.78	5.35	1.24	1.97	0.27	0.00
SCORPION SMR		9.64	4.07	0.05	0.69	0.33	0.01
ANACAPA ISLAND SMCA		7.30	3.50	0.00	0.54	0.03	0.00
ANACAPA ISLAND SMR		11.55	6.50	0.65	0.65	0.10	0.00
POINT DUME SMCA		15.92	0.44	0.85	1.05	0.00	0.00
POINT DUME SMR		7.53	1.54	0.57	0.47	0.00	0.89
BLUE CAVERN ONSHORE SMCA		2.61	1.68	1.40	0.88	0.01	0.00
LAGUNA BEACH SMR		6.72	2.48	0.00	1.13	0.00	0.00
DANA POINT SMCA		3.47	2.06	0.80	1.67	0.00	0.00
SWAMI'S SMCA		12.71	1.20	1.44	1.43	0.02	0.04
SOUTH LA JOLLA SMR		5.04	1.45	0.72	1.95	0.50	0.00
<b>NORTH BIOREGION TOTAL</b>		1618.90	301.58	104.23	114.65	79.24	0.76
<b>CENTRAL BIOREGION TOTAL</b>		1317.84	238.83	151.07	95.97	46.60	29.98
<b>SOUTH BIOREGION TOTAL</b>		2350.87	280.71	253.51	191.62	47.79	6.05

\*All miles are statute



## REFERENCE SITE CRITERIA

Comparison of ecological metrics between MPA index sites and reference sites outside of MPAs, or inside/outside comparison, has been well established as a method of assessing the progress of MPAs toward conservation goals (Paddock & Estes 2000, Gell & Roberts 2003, Lester & Halpern 2008, Lester et al. 2009). However, differences between MPA sites and sites outside of MPAs unrelated to protection status (e.g. habitat quality, physical oceanographic conditions) are also identified as common confounding factors when assessing the effects of protection (Charton & Ruzafa 1999, Charton et al. 2000). Therefore, effective MPA monitoring requires informed selection of reference sites outside of MPAs so that inside/outside comparison is meaningful.

For long-term monitoring, selection of reference sites will be the responsibility of individual PIs. Although this Action Plan does not mandate monitoring at specific reference sites, the state requires that reference sites be selected, and data be provided, that supports compatibility with the corresponding MPA index sites they are being compared to. Compatibility is based on the following criteria:

### Biotic Factors

- **Ecological conditions at the time of MPA implementation:** Detection of ecological divergence between MPA and reference sites requires similar initial conditions at both sites (Starr et al. 2015). Key metrics to consider include functional biodiversity, species composition, species density and biomass, and size frequency distributions.

### Human Uses

- **Fishing pressure at time of MPA implementation:** Responses of fished populations to MPA implementation are highly dependent on the level of fishing pressure to which those populations were exposed before being protected (Micheli et al. 2004, Kaplan et al. in prep, Yamane et al. in prep). Key metrics to consider include: local fishing mortality (F) for targeted species, if available; historical fishing effort; and/or regional proxies for fishing effort (e.g., distance from port).

- **Non-consumptive human use:** While generally less significant than fishing, non-consumptive human use (e.g., boating, tidepooling, scuba diving) affects marine ecosystems. Examples of deleterious effects associated with non-consumptive use include trampling, accidental take, and habitat alteration (Tratalos & Austin 2001, Davenport & Davenport 2006, Lloret et al. 2008). Key metrics to consider include: type and level of non-consumptive use (e.g. from MPA Watch beach surveys), water quality, and frequency of boat anchoring.

### Abiotic Factors

- **Geography:** Biogeographic boundaries play an important role in driving marine community structure, and California's coastline encompasses several distinct marine ecoregions. It is therefore crucial to group index sites and reference sites at the correct geographic scale (Hamilton et al. 2010). Furthermore, a reference site adjacent or proximate to an MPA may be ecologically connected to that MPA through larval dispersal or spillover of adult organisms, potentially confounding inside/outside comparison (Moffitt et al. 2013). Key metrics to consider include: presence of biogeographic barriers and distance between MPA and reference sites.
- **Habitat features:** Habitat/microhabitat type, quality, and availability are critical drivers of marine species distribution and community composition, in some cases more influential than the presence or absence of protection (Lindholm et al. 2004, Oliver et al. 2010, Starr et al. 2015, Fulton et al. 2016). Key metrics to consider include: depth, percent rock, rugosity, habitat complexity, macroalgal cover, and distribution of habitat types.
- **Geology:** Seafloor sediment and benthic communities both play important roles in driving marine community structure (Snelgrove 1997). Key metrics to consider include: underlying rock type (e.g., shale, granite), grain size, benthic community structure, and proximity to major geologic features such as submarine canyons.





- **Physical and chemical oceanography:** Physical and chemical oceanographic conditions have significant impacts on marine communities. For example, by driving patterns of larval dispersal or influencing nutrient availability in an ecosystem (Menge et al. 1997, Ruzicka et al. 2012, Nickols et al. 2013). Key metrics to consider include: primary productivity/nutrient availability, wave exposure (including direction, extent, and intensity), and variability and spatial distribution of relevant dynamics and processes, such as upwelling, fronts, river plumes, ocean acidification, and hypoxia.

***State-funded long-term monitoring projects will be required to justify reference site(s), based on the above criteria and using quantitative methods whenever possible.*** Qualitative comparisons are acceptable in situations where data are limited and potential reference sites are logistically difficult to access. Quantitative methods to address this question include: statistical comparison of habitat metrics (e.g., rock rugosity), habitat suitability modeling (Young et al. 2010), covariate analysis with matching models (Ahmadia et al. 2015), oceanographic observations, and oceanographic circulation models such as the ROMS (Moore et al. 2011).

### **BOX 3: Examining oceanographic and biogeographical conditions across MPAs and reference sites on the north coast.**

Along the California coast, marine ecosystems exist in a highly energetic and variable oceanographic environment that shapes the dynamics of populations and communities (Checkley and Barth, 2009, Bjorkstedt et al. 2017). Understanding how ocean conditions vary over space and time is therefore essential for interpreting ecological responses to spatial management. A diverse suite of ocean observations can be synthesized to characterize historical conditions and spatial context to inform adaptive management strategies for the MPA Network that account for changing ocean conditions due to climate change.

For example, analysis based on oceanographic data for MPAs and reference sites along the north coast of California suggests that in most cases, MPA-reference pairs share similar oceanographic influences across seasons, while also highlighting factors that may contribute to MPA-reference site differences as the ecosystem changes over time (Robinson et al, in prep). Successful development of oceanographic context for the north coast and its application, drawing on observation systems (e.g., CeNCOOS and NANOOS), might serve as a template for a statewide synthesis in support of broader, long-term monitoring, evaluation, and adaptive management of California's MPA Network.

## Indicator Species Selection

California's MPA Network was implemented, in part, to help conserve ecologically and economically important marine species, as well as to protect the structure and function of marine ecosystems. To that end, this Action Plan provides lists of species and species groups to target for long-term monitoring at MPA and reference sites (Tables 7-10). These lists of fishes, invertebrates, algae, and birds were compiled using the following sources (in the tables, "Y" indicates that the species is listed in the corresponding source, "N" indicates that it is not).

### MPA Regional Monitoring Plans.

These plans were developed during MPA baseline monitoring and include regionally-focused lists of ecologically and economically important marine species. Plans and associated species lists were developed for each of the four coastal planning regions in which the MLPA was implemented (north, north central, central, and south). However, it is important to note that long-term MPA monitoring will take place in three broader-scale bioregions, or clusters of similar biota, ecological communities, and key habitats, as discussed in section 2.3 above.

### Deepwater MPA Monitoring Workshop.

This 2017 workshop convened experts from across the state to discuss monitoring of deep marine ecosystems (>100 m depth) in California's MPAs. The species list developed at this workshop and included in Action Plan Appendix E represents these experts' best understanding of which species and species groups should be targeted for monitoring in deep ecosystems in order to meaningfully assess MPA performance.

### Marine Life Management Act.

The Marine Life Management Act (MLMA) Master Plan (CDFW 2018) identifies 36 species of finfish and invertebrates, which are the targets of 45 distinct fisheries, as priority species for fishery management. These species represent the majority of commercial landings value in California as well as species of particular recreational importance.

### Special Status Species.

For the purposes of this Action Plan, "species of special status" is any fish, invertebrate, algae, plant, or bird native to California that is identified in one of the four MPA regional monitoring plans, deepwater MPA monitoring workshop recommendations, or MLMA Master Plan, and currently satisfies one or more of the following criteria:

- Is listed as threatened or endangered under the Federal Endangered Species Act<sup>42</sup>
- Is listed as threatened or endangered under the California Endangered Species Act<sup>43</sup>
- Is identified as a species of concern<sup>44</sup> by the National Marine Fisheries Service. These species are not currently listed under an Endangered Species Act, but are identified as species to take proactive measures to address conservation needs in hopes of preventing the need to protect them under an Endangered Species Act
- Listed as overfished by the Pacific Fishery Management Council<sup>45</sup>
- Considered by CDFW to be a Species of Special Concern<sup>46</sup>. Currently experiencing a fishing moratorium, meaning this species was once targeted for commercial and/or recreational harvest, but now all direct take is prohibited

42. <https://www.fws.gov/endangered/>

43. [http://www.dfg.ca.gov/wildlife/nongame/t\\_e\\_spp/](http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/)

44. <https://www.fws.gov/endangered/>

45. <https://www.pcouncil.org/>

46. <https://www.wildlife.ca.gov/Conservation/SSC>

**TABLE 7:** Indicator fish species.

COMMON NAME	SCIENTIFIC NAME	Regional Monitoring Plans				DEEPWATER WORKSHOP	MLMA SPECIES
		NORTH	NORTH CENTRAL	CENTRAL	SOUTH		
ANCHOVY, NORTHERN	<i>Engraulis mordax</i>	N	N	Y	N	N	N
BASS, BARRED SAND	<i>Paralabrax nebulifer</i>	N	N	N	Y	Y	Y
BASS, GIANT SEA <sup>1</sup>	<i>Stereolepis gigas</i>	N	N	N	Y	Y	N
BASS, KELP	<i>Paralabrax clathratus</i>	N	N	N	Y	N	Y
BASS, SPOTTED SAND	<i>Paralabrax maculatofasciatus</i>	N	N	N	Y	N	Y
BLACKSMITH	<i>Chromis punctipinnis</i>	N	N	N	Y	N	N
CABEZON	<i>Scorpaenichthys marmoratus</i>	Y	Y	Y	Y	N	N
CROAKER	Sciaenidae	N	N	N	Y	N	N
CROAKER, WHITE SEABASS	<i>Atractoscion nobilis</i>	N	N	N	Y	N	Y
FLATFISH	Multiple spp.	Y	Y	Y	Y	Y	N
FLATFISH, CALIFORNIA HALIBUT	<i>Paralichthys californicus</i>	N	Y	Y	Y	N	Y
FLATFISH, DIAMOND TURBOT	<i>Pleuronichthys guttulatus</i>	N	N	Y	N	N	N
FLATFISH, DOVER SOLE	<i>Microstomus pacificus</i>	N	N	Y	N	N	N
FLATFISH, ENGLISH SOLE	<i>Parophrys vetulus</i>	N	N	Y	N	N	N
FLATFISH, PACIFIC HALIBUT	<i>Hippoglossus stenolepis</i>	Y	N	N	N	N	N
FLATFISH, PACIFIC SANDDAB	<i>Citharichthys sordidus</i>	N	N	Y	N	N	N
FLATFISH, PETRALE SOLE	<i>Eopsetta jordani</i>	N	N	Y	N	N	N
FLATFISH, STARRY FLOUNDER	<i>Platichthys stellatus</i>	Y	Y	Y	N	Y	N
GOBY	Gobiidae	N	N	Y	Y	N	N
GOBY, BLACK EYE	<i>Rhinogobiops nicholsii</i>	N	N	Y	N	N	N
GREENLING, KELP	<i>Hexagrammos decagrammus</i>	Y	Y	Y	N	N	N
GREENLING, PAINTED	<i>Oxylebius pictus</i>	N	Y	Y	N	N	N
GUJARFISH, SHOVELNOSE	<i>Rhinobatos productus</i>	N	N	N	Y	N	N
HAGFISH, PACIFIC	<i>Eptatretus stoutii</i>	N	N	Y	Y	N	Y
HERRING, PACIFIC	<i>Clupea pallasii</i>	Y	N	N	N	N	Y
LINGCOD	<i>Ophiodon elongatus</i>	Y	Y	Y	Y	Y	N
OCEAN WHITEFISH	<i>Caulolatilus princeps</i>	N	N	N	Y	Y	Y
PERCH	Embiotocidae	Y	Y	Y	Y	N	N
PERCH, BLACK	<i>Embiotoca jacksoni</i>	N	N	Y	N	N	N
PERCH, PILE	<i>Rhacochilus vacca</i>	N	N	Y	N	N	N
PERCH, SHINER	<i>Cymatogaster aggregata</i>	N	Y	Y	N	N	Y
PERCH, STRIPED SEA	<i>Embiotoca lateralis</i>	Y	Y	Y	N	N	N
PRICKLEBACK, MONKEYFACE	<i>Cebidichthys violaceus</i>	N	Y	Y	N	N	N
PRICKLEBACK, ROCK	<i>Xiphister mucosus</i>	N	Y	N	N	N	N
RATFISH, SPOTTED	<i>Hydrolagus colliciei</i>	N	N	Y	N	Y	N
RAY, BAT	<i>Myliobatis californicus</i>	N	Y	Y	Y	N	N
ROCKFISH	<i>Sebastes</i> spp.	Y	Y	Y	Y	Y	N
ROCKFISH, AURORA	<i>Sebastes aurora</i>	N	N	N	N	Y	N
ROCKFISH, BANK	<i>Sebastes rufus</i>	N	N	Y	Y	N	N
ROCKFISH, BLACK	<i>Sebastes melanops</i>	Y	Y	Y	N	N	N
ROCKFISH, BLACK-AND-YELLOW	<i>Sebastes chrysomelas</i>	Y	Y	Y	N	N	N

COMMON NAME	SCIENTIFIC NAME	Regional Monitoring Plans				DEEPWATER WORKSHOP	MLMA SPECIES
		NORTH	NORTH CENTRAL	CENTRAL	SOUTH		
ROCKFISH, BLUE	<i>Sebastes mystinus</i>	Y	Y	Y	Y	N	N
ROCKFISH, BOCACCIO <sup>2</sup>	<i>Sebastes paucispinis</i>	N	Y	Y	Y	Y	N
ROCKFISH, BROWN	<i>Sebastes auriculatus</i>	Y	Y	N	N	Y	N
ROCKFISH, CANARY	<i>Sebastes pinniger</i>	Y	Y	Y	N	Y	N
ROCKFISH, CHINA	<i>Sebastes nebulosus</i>	N	Y	Y	N	N	N
ROCKFISH, COPPER	<i>Sebastes caurinus</i>	Y	Y	Y	N	Y	N
ROCKFISH, COWCOD <sup>2,3</sup>	<i>Sebastes levis</i>	N	N	Y	Y	Y	N
ROCKFISH, DWARF	<i>Sebastes</i> spp.	Y	Y	Y	Y	Y	N
ROCKFISH, GOPHER	<i>Sebastes carnatus</i>	N	Y	Y	N	Y	N
ROCKFISH, GREENSPOTTED	<i>Sebastes chlorostictus</i>	N	N	N	N	Y	N
ROCKFISH, GREENSTRIPED	<i>Sebastes elongatus</i>	Y	N	N	N	Y	N
ROCKFISH, KELP	<i>Sebastes atrovirens</i>	Y	Y	Y	Y	N	N
ROCKFISH, OLIVE	<i>Sebastes serranoides</i>	N	N	N	Y	N	N
ROCKFISH, QUILLBACK	<i>Sebastes maliger</i>	N	N	N	N	Y	N
ROCKFISH, ROSY	<i>Sebastes rosaceus</i>	N	N	Y	N	N	N
ROCKFISH, SHORTBELLY	<i>Sebastes jordani</i>	Y	Y	Y	Y	N	N
ROCKFISH, SPLITNOSE	<i>Sebastes diploproa</i>	N	N	N	N	Y	N
ROCKFISH, VERMILION	<i>Sebastes miniatus</i>	Y	Y	Y	Y	Y	N
ROCKFISH, WIDOW	<i>Sebastes entomelas</i>	Y	Y	Y	Y	Y	N
ROCKFISH, YELLOWEYE <sup>3</sup>	<i>Sebastes ruberrimus</i>	Y	Y	Y	N	Y	N
ROCKFISH, YELLOWTAIL	<i>Sebastes flavidus</i>	Y	Y	Y	N	N	N
SABLEFISH	<i>Anoplopoma fimbria</i>	Y	N	Y	Y	Y	N
SALMONIDS	<i>Oncorhynchus</i> spp.	Y	N	Y	N	N	N
SARDINE, PACIFIC	<i>Sardinops sagax</i>	N	N	Y	N	N	N
SCORPIONFISH, CALIFORNIA	<i>Scorpaena guttata</i>	N	N	N	Y	Y	N
SCULPIN	Cottidae	Y	N	Y	N	N	N
SEÑORITA	<i>Oxyjulis californica</i>	N	N	Y	Y	N	N
SHARK, LEOPARD	<i>Triakis semifasciata</i>	Y	Y	Y	Y	N	N
SHARK, PACIFIC ANGEL	<i>Squatina californica</i>	N	N	N	Y	Y	Y
SHEEPHEAD, CALIFORNIA	<i>Semicossyphus pulcher</i>	N	N	N	Y	Y	Y
SILVERSIDE, CALIFORNIA GRUNION	<i>Leuresthes tenuis</i>	N	N	Y	Y	N	N
SILVERSIDE, JACKSMELT	<i>Atherinopsis californiensis</i>	N	N	N	Y	N	Y
SILVERSIDE, TOPSMELT	<i>Atherinops affinis</i>	Y	N	Y	Y	N	N
SKATE, CALIFORNIA	<i>Raja inornata</i>	N	N	Y	N	N	N
SKATE, LONGNOSE	<i>Raja rhina</i>	N	N	Y	N	Y	N
SMELT, NIGHT	<i>Spirinchus starksi</i>	N	N	Y	N	N	Y
SMELT, SURF	<i>Hypomesus pretiosus</i>	Y	Y	Y	N	N	N
STICKLEBACK, THREESPINE	<i>Gasterosteus aculeatus</i>	Y	N	N	N	N	N
THORNYHEAD	<i>Sebastolobus</i> spp.	Y	N	Y	N	N	N
TUBESNOUT	<i>Aulorhynchus flavidus</i>	N	N	Y	N	N	N
YOUNG-OF-YEAR	Multiple spp.	Y	Y	Y	Y	N	N

1. Special status: Fishing moratorium (no direct commercial or recreational fishing allowed)

2. Special status: Identified as a species of concern by the National Marine Fisheries Service

3. Special status: Listed as overfished by the Pacific Fishery Management Council, as of 8/24/2018

**TABLE 8:** Indicator invertebrate species.

COMMON NAME	SCIENTIFIC NAME	Regional Monitoring Plans				DEEPWATER WORKSHOP	MLMA SPECIES
		NORTH	NORTH CENTRAL	CENTRAL	SOUTH		
ABALONE	<i>Haliotidae</i>	N	N	N	Y	N	N
ABALONE, BLACK <sup>1,2</sup>	<i>Haliotis cracherodii</i>	N	Y	Y	Y	N	N
ABALONE, RED <sup>2</sup>	<i>Haliotis rufescens</i>	Y	Y	Y	N	N	Y
AMPHIPOD, GAMMARID	<i>Gammaridae</i>	N	N	Y	N	N	N
ANEMONE, FISH-EATING	<i>Urticina piscivora</i>	N	N	Y	N	N	N
ANEMONE, LARGE SOLITARY	Multiple spp.	N	N	N	N	Y	N
ANEMONE, PLUMOSE	<i>Metridium</i> spp.	Y	Y	Y	Y	Y	N
BARNACLE	<i>Balanus</i> spp. <i>Chthamalus fissus/dalli</i>	Y	N	Y	Y	N	N
BARNACLE, ACORN	<i>Balanus glandula</i>	N	N	Y	N	N	N
BARNACLE, GOOSENECK	<i>Pollicipes polymerus</i>	N	N	Y	N	N	N
BARNACLE, PINK VOLCANO	<i>Tetracita rubescens</i>	N	N	Y	N	N	N
BARNACLE, THATCHED	<i>Semibalanus cariosus</i>	N	N	Y	N	N	N
CLAM	Multiple spp.	Y	N	N	N	N	N
CLAM, BEAN	<i>Donax gouldii</i>	N	N	N	Y	N	N
CLAM, GEODUCK	<i>Panopea generosa</i>	Y	Y	Y	N	N	Y
CLAM, PACIFIC GAPER	<i>Tresus nuttallii</i>	Y	Y	Y	Y	N	N
CLAM, PACIFIC LITTLENECK	<i>Leukoma staminea</i>	Y	Y	Y	Y	N	N
CLAM, PACIFIC RAZOR	<i>Siliqua patula</i>	Y	Y	N	N	N	N
CLAM, PISMO	<i>Tivela stultorum</i>	N	N	N	Y	N	Y
CLAM, WASHINGTON	<i>Saxidomus nuttalli</i>	N	N	N	Y	N	N
CORAL, BLACK	<i>Antipathes</i> spp.	N	N	Y	N	N	N
CORAL, LOPHELIA	<i>Lophelia</i>	N	N	N	N	Y	N
CORAL, MUSHROOM SOFT	<i>Anthomastus ritteri</i>	Y	N	N	N	N	N
CORAL, SOFT	<i>Octocorallia</i>	N	N	Y	N	N	N
CRAB, BROWN BOX	<i>Lopholithodes foraminatus</i>	N	Y	Y	N	Y	N
CRAB, DUNGENESS	<i>Metacarcinus magister</i>	Y	Y	Y	N	N	Y
CRAB, GALATHEID (SQUAT LOBSTER)	<i>Munida quadrispina</i>	N	N	Y	N	N	N
CRAB, ROCK	<i>Cancer</i> spp. <i>Metacarcinus</i> spp.	Y	Y	Y	Y	Y	N
CRAB, SAND	<i>Emerita</i> spp.	Y	Y	Y	Y	N	N
CRAB, SHEEP	<i>Loxorhynchus grandis</i>	N	Y	Y	N	Y	N
CRAB, YELLOW SHORE	<i>Hemigrapsus oregonensis</i>	Y	N	N	N	N	N
CRINOID	<i>Crinoidea</i>	N	N	Y	N	Y	N
GORGONIAN, SHORT RED	<i>Muricea</i> spp.	Y	N	N	N	N	N
HYDROCORAL <sup>2</sup>	<i>Stylasterina</i> spp.	N	Y	Y	Y	N	N
ISOPOD, EELGRASS	<i>Pentidotea resicata</i>	N	N	Y	N	N	N
LIMPET, GIANT KEYHOLE	<i>Megathura crenulata</i>	N	N	N	Y	N	N
LIMPET, OWL	<i>Lottia gigantea</i>	N	Y	Y	Y	N	N
LOBSTER, CALIFORNIA SPINY	<i>Panulirus interruptus</i>	N	N	N	Y	N	Y
MUSSEL	<i>Mytilus</i> spp.	Y	Y	Y	Y	N	N



COMMON NAME	SCIENTIFIC NAME	Regional Monitoring Plans				DEEPWATER WORKSHOP	MLMA SPECIES
		NORTH	NORTH CENTRAL	CENTRAL	SOUTH		
OCTOPUS, RED	<i>Octopus rubescens</i>	Y	N	N	N	N	N
OYSTER, OLYMPIA	<i>Octopus rubescens</i>	Y	Y	Y	N	N	N
PRAWN, RIDGEBACK	<i>Sicyonia ingentis</i>	N	N	N	Y	Y	Y
PRAWN, SPOT	<i>Pandalus platyceros</i>	N	N	Y	Y	N	Y
SAND DOLLAR	<i>Dendraster excentricus</i>	N	Y	Y	N	N	N
SEA CUCUMBER, CALIFORNIA	<i>Parastichopus californicus</i>	Y	N	Y	Y	Y	Y
SEA CUCUMBER, WARTY	<i>Parastichopus parvimensis</i>	N	N	N	N	Y	Y
SEA PEN	Multiple spp.	Y	N	Y	N	N	N
SEA WHIP	Multiple spp.	Y	N	Y	N	N	N
SHRIMP, BAY GHOST	<i>Neotrypaea californiensis</i>	N	Y	Y	Y	N	N
SHRIMP, MUD	<i>Upogebia pugettensis</i>	N	Y	Y	Y	N	N
SNAIL, EMARGINATE DOG WINKLE	<i>Nucella emarginata</i>	N	N	Y	N	N	N
SNAIL, TURBAN	<i>Tegula</i> spp.	Y	N	Y	Y	N	N
SNAIL, WAVY TURBAN	<i>Megastrea undosa</i>	N	N	N	Y	N	N
SPONGE	<i>Porifera</i> spp.	N	N	Y	N	Y	N
SQUID, MARKET	<i>Doryteuthis opalescens</i>	N	N	Y	Y	N	Y
STAR	Multiple spp.	Y	Y	Y	Y	Y	N
STAR, BASKET	Multiple spp.	Y	N	Y	N	N	N
STAR, BAT	<i>Patiria miniata</i>	Y	N	Y	N	N	N
STAR, BRITTLE	Ophiuroidea	N	N	Y	Y	Y	N
STAR, DEEP SAND	<i>Thriacanthias penicillatus</i>	N	N	Y	N	N	N
STAR, OCHRE SEA	<i>Pisaster ochraceus</i>	Y	Y	Y	Y	N	N
STAR, RED SEA	<i>Mediaster aequalis</i>	N	N	Y	N	N	N
STAR, SAND	<i>Luidia foliolata</i>	N	N	Y	N	N	N
STAR, SUNFLOWER SEA	<i>Pycnopodia helianthoides</i>	Y	Y	Y	Y	N	N
TUNICATE, COMPOUND	Multiple spp.	N	Y	N	N	N	N
URCHIN, FRAGILE PINK SEA	<i>Strongylocentrotus fragilis</i>	N	N	Y	N	N	N
URCHIN, PURPLE SEA	<i>Strongylocentrotus purpuratus</i>	Y	Y	Y	Y	N	N
URCHIN, RED SEA	<i>Mesocentrotus franciscanus</i>	Y	Y	Y	Y	N	Y
URCHIN, WHITE SEA	<i>Lytechinus pictus</i>	N	N	N	N	Y	N
WHELK, KELLET'S	<i>Kelletia kelletii</i>	N	N	N	Y	N	Y
WORM, FAT INNKEEPER	<i>Urechis caupo</i>	N	Y	Y	N	N	N
WRACK ASSOCIATED INVERTEBRATES	Multiple spp.	Y	N	Y	Y	N	N

1. Special status: Listed as federally endangered under the Federal Endangered Species Act

2. Special status: Fishing moratorium (no direct commercial or recreational fishing allowed)

**TABLE 9:** Indicator algae and plant species.

COMMON NAME	SCIENTIFIC NAME	Regional Monitoring Plans				DEEPWATER WORKSHOP	MLMA SPECIES
		NORTH	NORTH CENTRAL	CENTRAL	SOUTH		
ALGAE, CORALLINE	<i>Corallina</i> spp.	Y	N	Y	Y	N	N
ALGAE, ENCRUSTING NON-CORALLINE	Multiple spp.	Y	N	N	Y	N	N
ALGAE, FOLIOSE RED	Multiple spp.	Y	Y	N	Y	N	N
ALGAE, GOLDEN ROCKWEED	<i>Silvetia compressa</i>	N	N	Y	N	N	N
ALGAE, RED	Multiple spp.	Y	N	Y	N	N	N
ALGAE, ROCKWEED	<i>Fucaceae</i> spp.	Y	Y	Y	Y	N	N
ALGAE, SEA LETTUCE	<i>Ulva</i> spp.	Y	Y	Y	N	N	N
ALGAE, SUB CANOPY	Multiple spp.	Y	Y	N	Y	N	N
ALGAE, TURF	Multiple spp.	Y	Y	Y	Y	N	N
BEACH WRACK	Multiple spp.	Y	N	Y	Y	N	N
EELGRASS	<i>Zostera marina</i>	Y	Y	Y	Y	N	N
KELP, BROAD-RIBBED	<i>Pleurophycus gardneri</i>	N	N	Y	N	N	N
KELP, BULL	<i>Nereocystis luetkeana</i>	Y	Y	Y	N	N	N
KELP, ELK	<i>Pelagophycus porra</i>	N	N	N	Y	N	N
KELP, FEATHER BOA	<i>Egregia menziesii</i>	Y	Y	N	Y	N	N
KELP, GIANT	<i>Macrocystis pyrifera</i>	N	Y	Y	Y	N	N
KELP, KOMBU	<i>Laminaria setchellii</i>	N	N	Y	N	N	N
KELP, SEA PALM	<i>Postelsia palmaeformis</i>	Y	N	Y	N	N	N
KELP, SOUTHERN SEA PALM	<i>Eisenia arborea</i>	N	N	Y	N	N	N
KELP, STALKED	<i>Pterygophora californica</i>	Y	N	Y	N	N	N
PICKLEWEED	<i>Salicornia</i> spp.	Y	Y	N	Y	N	N
SURFGRASS	<i>Phyllospadix</i> spp.	Y	Y	Y	Y	N	N





**TABLE 10:** Indicator bird species.

COMMON NAME	SCIENTIFIC NAME	Regional Monitoring Plans				DEEPWATER WORKSHOP	MLMA SPECIES
		NORTH	NORTH CENTRAL	CENTRAL	SOUTH		
AUKLET, CASSIN'S	<i>Ptychoramphus aleuticus</i>	N	Y	N	Y	N	N
BIRD, PISCIVOROUS	Multiple spp.	Y	Y	Y	Y	N	N
BIRD, PREDATORY	Multiple spp.	Y	Y	N	N	N	N
BIRD, SHORE	Multiple spp.	Y	Y	Y	Y	N	N
CORMORANT, BRANDT'S	<i>Phalacrocorax penicillatus</i>	Y	Y	Y	Y	N	N
CORMORANT, PELAGIC	<i>Phalacrocorax pelagicus</i>	Y	Y	Y	Y	N	N
GUILLEMOT, PIGEON	<i>Cephus columba</i>	Y	Y	Y	Y	N	N
MURRE, COMMON	<i>Uria aalge</i>	Y	Y	N	N	N	N
OYSTERCATCHER, BLACK	<i>Haematopus bachmani</i>	N	Y	Y	N	N	N
PELICAN, BROWN	<i>Pelecanus occidentalis</i>	N	N	N	Y	N	N
POLOVER, WESTERN SNOWY <sup>1,2</sup>	<i>Charadrius nivosus nivosus</i>	N	N	Y	N	N	N
SHEARWATER, SOOTY	<i>Puffinus griseus</i>	N	N	N	Y	N	N
SURFBIRD	<i>Calidris virgata</i>	N	N	Y	N	N	N
TERN, CALIFORNIA LEAST <sup>3,4</sup>	<i>Sterna antillarum browni</i>	N	N	N	Y	N	N
TURNSTONE, BLACK	<i>Arenaria melanocephala</i>	N	N	Y	N	N	N
WATERFOWL (DABBING AND DIVING DUCKS)	Multiple spp.	N	N	Y	N	N	N

1. Special status: Listed as federally threatened under the Federal Endangered Species Act
2. Special status: CDFW Species of Special Concern
3. Special status: Listed as federally endangered under the Federal Endangered Species Act
4. Special status: Listed as state endangered under the California Endangered Species Act



## OTHER SPECIES OF SPECIAL INTEREST

Although the primary goal of this Action Plan is to outline a long-term MPA monitoring strategy that will directly address the goals of the MLPA, the state is also working to integrate MPAs into other resource management efforts, such as climate change adaptation and invasive species programs. To that end, the following species of special interest should be targeted for long-term monitoring inside and outside MPAs when feasible.

### Invasive Species

The impact of aquatic invasive species is not widely understood, especially related to MPAs. Available management options vary depending on characteristics of both the impacted site and the invasive species, and are generally limited to either control or eradication of invaders (Anderson 2007, Williams & Grosholz 2008). The Monitoring Program will work to identify opportunities to link MPAs and marine invasive species management, both internally and with other agencies responsible for managing invasive species, such as the California State Lands Commission (SLC) and California Coastal Commission. In addition, CDFW's Office of Spill Prevention and Response Marine Invasive Species Program<sup>47</sup> (MISP) conducts biological monitoring in coastal and estuarine waters to determine the level of invasion by non-native species and works to coordinate with the SLC. The Monitoring Program will work to integrate MPA considerations into future biological monitoring by MISP and help to detect new introductions that may impact MPAs.

### Climate Change Species Indicators

Species that may act as good indicators for studying the effects of climate change should be considered when developing monitoring priorities. Although the MLPA does not require consideration of climate change in MPA management, the Monitoring Program recognizes that climate change is affecting oceanographic conditions along the California coast, including within MPAs. Research is continually emerging regarding the effects of climate change stressors, such as ocean acidification and hypoxia, and shifts in upwelling and temperature regimes on marine species (Bruno et al. 2018). The Monitoring Program is building partnerships with groups that have aligned and complementary expertise and missions regarding the impacts of climate change on indicator species and the MPA Network.

47. <https://www.wildlife.ca.gov/Conservation/Invasives>



## Monitoring In Other Habitat Types

At this time, the Monitoring Program focuses sampling on shallower (<100 m depth) hard substrate along the open coast. However, that does not preclude sampling in the other habitat types, despite some challenges. Sandy beaches are highly dynamic and heavily affected by land-based factors (Dugan & Hubbard 2016). Due to the lower density of emergent benthic species in soft-bottom habitats, robust sampling of these environments to track change over time can be costly. However, emerging methods are making sampling more cost efficient.

The water surrounding deeper canyons and pelagic environments are highly dynamic and many non-benthic populations that use these areas are highly mobile (Block et al. 2011, Zwolinski et al. 2012, Bograd et al. 2016). Ecosystems deeper than 100 m have also traditionally presented significant challenges to monitor in both logistics and cost (for more information on monitoring deep ecosystems, see Appendix E). In addition, the increasing effectiveness of remote sensing and ocean circulation models will be key factors in interpreting the results of monitoring for all habitat types, as physical and chemical oceanographic factors within the CCLME are primary drivers of the structure and function of marine communities (McGowan et al. 2003, Menge et al. 2003, Broitman & Kinlan 2006, Blanchette et al. 2016, Lindegren et al. 2018).

At the land and ocean interface, estuaries are highly productive ecosystems that support important habitats (e.g., eelgrass, salt marshes, tidal mudflats) and provide critical refugia and nursery functions for a wide variety of species including those of economic value (Beck et al. 2001, Sheaves et al. 2015). Estuaries are sensitive habitats, and their natural function and associated area of wetlands have decreased significantly with increased coastal development (Allen et al. 2006, Cloern et al. 2016). The estuaries in California range widely from brackish lagoons that breach every several years to river mouth estuaries and oceanic-dominated embayments (Cloern et al. 2016). California's estuaries are generally highly modified, particularly in southern California, and each has a unique suite of stressors and marine, freshwater, and geomorphological conditions (Allen et al. 2006, Hughes et al. 2015,

Cloern et al. 2016, Shaughnessy et al. 2017, Toft et al. 2018). A recent review of existing monitoring in California's 22 estuarine MPAs identified core indicators regularly monitored statewide, including 1) eelgrass areal coverage, 2) clams abundance, 3) marine/shorebird abundance, 4) marine mammal abundance, 5) dissolved oxygen, and 6) pH (Hughes 2017, Appendix C). Hughes (2017) also prioritized additional indicators for long-term MPA monitoring in estuaries across the state, including additional vegetation types (e.g., salt marshes) and macroalgae (e.g., *Ulva* and *Gracilaria* spp.), salinity, nutrients (e.g., nitrate, ammonium, and phosphate), invasive species, Olympia oysters (*Ostrea lurida*), and standardized beach seining for fish communities.

There are numerous existing long-term estuarine monitoring programs in California<sup>48</sup>. For example, San Francisco Bay monitoring efforts represent among the world's longest observational programs in an estuary and serve as a model system to better understand how ecosystems between land and ocean are structured, function, and change over time (Cloern & Jassby 2012, Raimonet & Cloern 2016, Cloern et al. 2017). Another example is NOAA's National Estuarine Research Reserve System-wide Monitoring Program which generates systematic water quality and weather monitoring data for 29 estuaries across the United States, including three in California (San Francisco Bay, Elkhorn Slough, and Tijuana River)<sup>49</sup>. However, many estuarine monitoring programs outside of San Francisco Bay are generally limited in duration, to particular estuaries, or to certain indicators (Hughes 2017). For example, existing long-term monitoring efforts in California take place at specific sites (e.g., Malibu Lagoon, Ballona Wetlands, Santa Clara River estuary), for relevant metrics in larger estuaries (e.g., Morro, Humboldt, San Diego, Tomales Bays), and regionally (e.g., across the southern California bight led by the Southern California Coastal Water Research Project<sup>50</sup>). These types of well-planned and robust monitoring sites and efforts can address questions related to MPA performance in areas that overlap with the MPA Network. However, monitoring

48. California Estuary Portal: [https://mywaterquality.ca.gov/eco\\_health/estuaries/index.html](https://mywaterquality.ca.gov/eco_health/estuaries/index.html).

49. NOAA National Estuarine Research Reserves: <https://coast.noaa.gov/nerrs/research/>.

50. Southern California Coastal Water Research Project regional monitoring: <http://www.sccwrp.org/ResearchAreas/RegionalMonitoring.aspx>.





estuarine reference sites is challenging due to the unavailability of a similar site or because monitoring is focused on site based questions only. There is a need to further standardize metrics and develop coordinated, cost-effective, and repeatable methods across California estuaries to track key indicator species and habitats over time. For example, other wetland-associated assessment tools may be potentially adapted to certain estuarine habitats to expedite monitoring across the state (e.g., California Rapid Assessment Method<sup>51</sup>). The Monitoring Program will continue to track these efforts to determine the best approach to estuarine long-term monitoring within the MPA Network. See Appendix C for more information on estuarine MPA monitoring site recommendations.

While MPAs encompass some nearshore pelagic habitat within state waters (i.e., the water column overlying the continental shelf at depths greater than 30 m), monitoring specifically focused on the effects of protection of this habitat is difficult to implement. Many pelagic species are highly transient and may not spend significant amounts of time within MPA boundaries. However, pelagic species could be indicators of food web dynamics and shifts in ecological and physical factors in nearshore pelagic habitat within MPAs. These species will continue to be monitored within fisheries management context and their abundance and stock structure can be reported along with species monitored specifically within this plan.

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51. California Rapid Assessment Method: <https://www.cramwetlands.org/>.



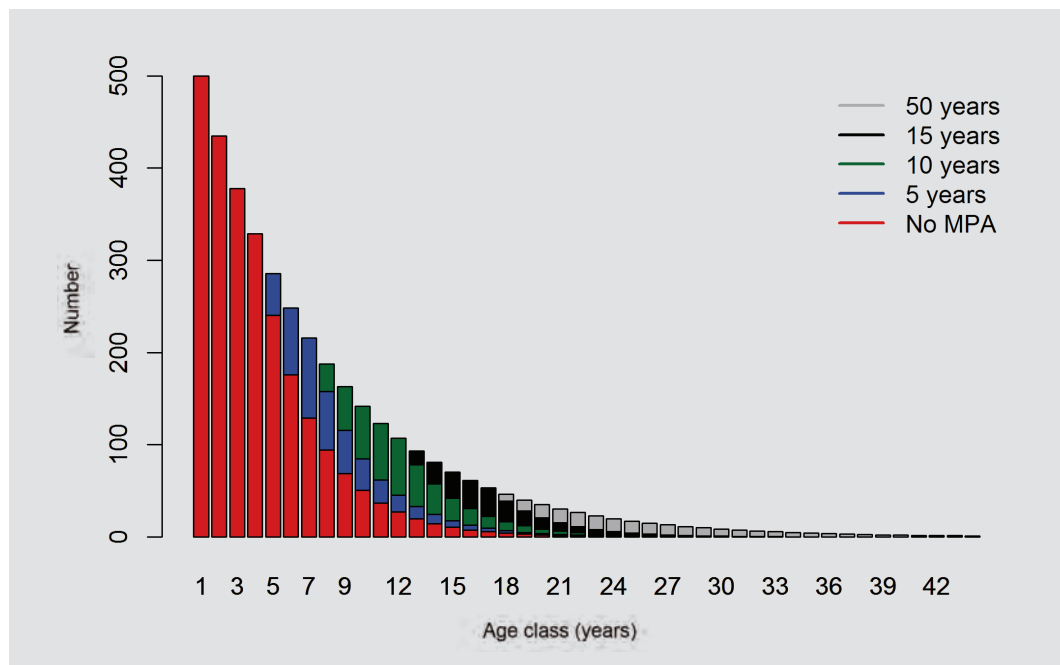
### 3. Approaches For Network Performance Evaluations

**ADAPTIVE MANAGEMENT**, as defined by the MLPA, is a process that facilitates learning from program actions and helps evaluate whether the MPA Network is making progress toward achieving the six goals of the MLPA (FGC §2852[a]; see Glossary for the full definition of adaptive management). California has set a 10-year MPA management review cycle as a mechanism to gather sufficient information for evaluating network efficacy and to inform the adaptive management process (CDFW 2016). Beginning in 2017, CDFW and researchers at University of California, Davis (UC Davis) co-mentored three postdoctoral researchers on MPA specific research projects intended to help inform long-term monitoring and the adaptive management process, including better understanding expectations of changes in highly dynamic temperate ecosystems such as the CCLME. Such expectations can inform adaptive management because they enable testing of species responses to MPA implementation, which provide updates in knowledge or management strategies. Quantitative analyses focused on examining the ability to detect population responses to MPAs over time, including incorporating spatial differences in fishing mortality rates. Analyses also focused on informing sample design for deepwater surveys and comparisons of various fish monitoring techniques being used for nearshore marine ecosystems and MPAs.



### ANALYSIS 1: Projecting Changes And Their Statistical Detectability Following MPA Implementation

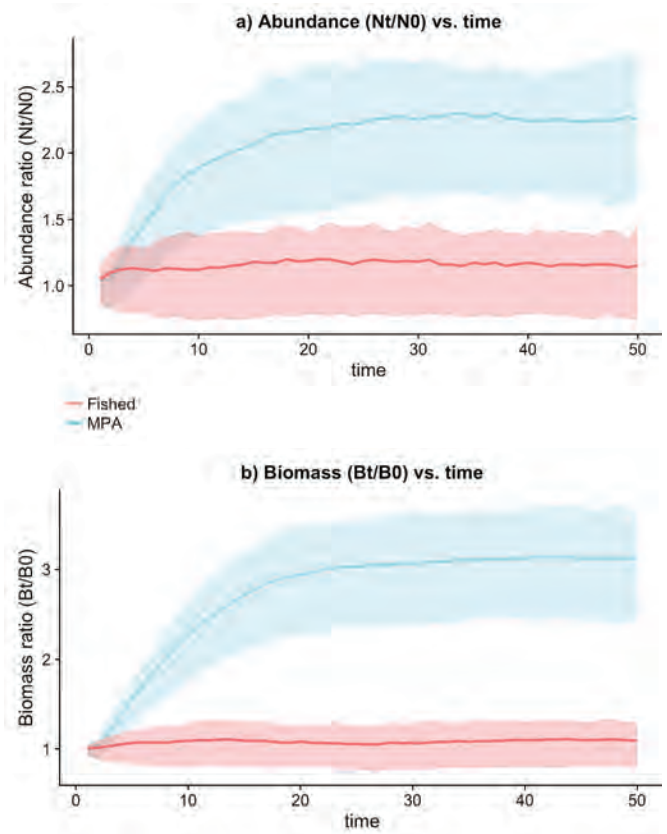
Modeled projections, or future estimates, of the timing and magnitude of marine life population responses to MPAs can inform adaptive management. This approach serves as a comparison between actual observations in the field and models of population responses to MPAs for evaluation of MPA performance at ecologically relevant time frames. Here we use two of the species level metrics mentioned in Section 2.3: abundance (which is the same as density here) and biomass. Globally, there are many reported levels of increase in these metrics with the implementation of MPAs (Lester et al. 2009). The increase in abundance and biomass are likely due to the effects of MPA protection on the age and size structure of the targeted species. Once an MPA is implemented, the expected response is that a population “fills in” over time with a greater proportion of older, larger individuals as a population approaches its stable age distribution after fishing mortality ceases (Baskett & Barnett 2015). This is essentially the first detectable effect of an MPA, and other longer-term potential effects (e.g., increased recruitment, changes in community structure) depend on this filling in effect (Baskett & Barnett 2015). Expected responses in abundance and biomass may be predicted from a species’ life history and historical fishing rates (White et al. 2013). For example, Figure 4 demonstrates the filling in mechanism for blue rockfish (*Sebastes mystinus*), an abundant and important recreational and commercial species in California, where the age distribution moves from left to right, from red to gray over time.



**FIGURE 4:** Number of individual blue rockfish (*Sebastes mystinus*) per age class increases in an MPA over time as compared to no MPA (fished state, red). Results shown for 5, 10, 15, and 50 years since MPA implementation, demonstrating the “filling-in” effect that occurs in an MPA for a previously harvested population. (This figure shows preliminary analyses by the UC Davis/CDFW postdoctoral researchers. Manuscripts detailing methodology and results are in preparation.)

The filling in and associated increase in abundance and biomass responses occur rapidly at first and then level off over time. The expected time frame to level off depends on the inverse of the natural mortality rate, which is a measure of the lifespan of the species. Thus, longer lived species take more time to observe population level responses to MPAs compared to short-lived species. The final population response to MPA implementation in terms of the change in the ratio of total abundance is dependent on the ratio of the fishing mortality rate ( $F$ ) to the natural mortality rate ( $M$ ) and will be proportional to  $(M+F)/M$ . In other words, the final expected gain in species abundance due to implementing an MPA depends on how heavily the population was fished before the MPA was put in place relative to the species natural mortality rate. The expected saturation level for the eventual abundance relative to its pre-MPA value is the ratio of the total pre-MPA mortality, fishing ( $F$ ) plus natural mortality, to the post-MPA mortality, natural mortality  $M$  (i.e., ending abundance =  $(M+F)/M$  \* starting abundance; White et al 2013). The relative biomass increase is always greater than the relative abundance increase because biomass also includes weight and age increases as individuals survive to be larger and older (Figure 5; Kaplan et al in prep.). Variable recruitment will lead to variation around this expected average (lighter colored “clouds” surrounding each line in Figure 5). Initially, this uncertainty can make an MPA effect difficult to detect (i.e., where the clouds of variability overlap).

However, as the potential MPA response increases through time, the clouds become more separated, and we can be more confident in deciding whether the MPA is working as expected. Statistical analysis of simulations of expected trajectories with and without an MPA, illustrated in Figure 5, can project the detectability of response over time (Kaplan et al in prep.).



**FIGURE 5:** Blue rockfish population response projection with variable recruitment. Population projection in abundance (a) and biomass (b), relative to the initial value at MPA establishment, within an MPA (blue) and without an MPA (red).  $N_t$ =measure of abundance in each size class over time.  $N_0$ =initial abundance at time of MPA implementation.  $B_t$ =measure of change in biomass over time.  $B_0$ =population biomass at time of MPA implementation. Note difference in y-axis values. (This figure shows preliminary analyses by the UC Davis/CDFW postdoctoral researchers. Manuscripts detailing methodology and results are in preparation.)

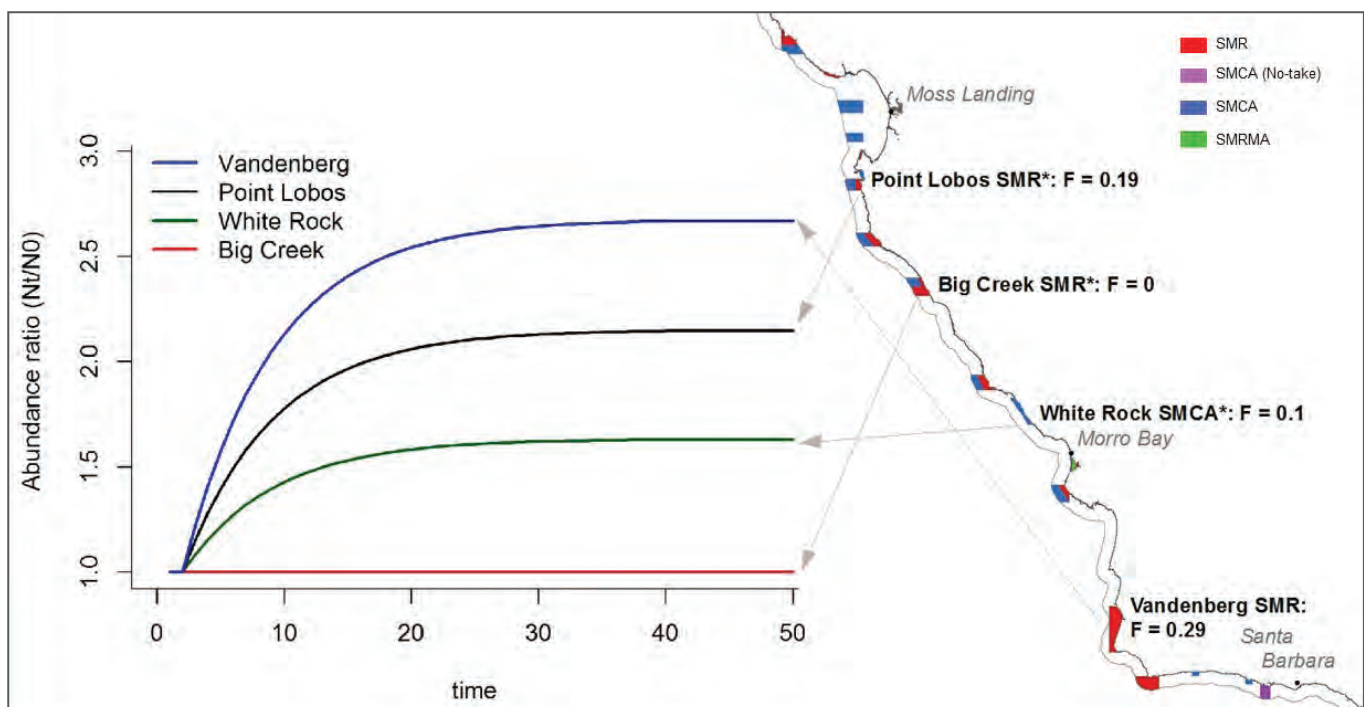


## ANALYSIS 2: Incorporating Spatial Differences in Fishing Mortality to Project Population Responses to MPAs

Because abundance and biomass responses depend directly on the fishing mortality rate prior to MPA implementation, measuring local fishing mortality is crucial for accurate predictions against which to compare monitoring data. In addition, as noted above, measuring local fishing mortality can identify target locations for monitoring prioritization. For example, coupling a monitoring site with an area recognized to have a relatively high local fishing mortality rate could result in a more detectable expected increase in abundance and biomass inside an MPA.

Fishing mortality rates for an individual species vary over space (Ralston & O'Farrell 2008). For example, Nickols et al. (in review) estimated local fishing

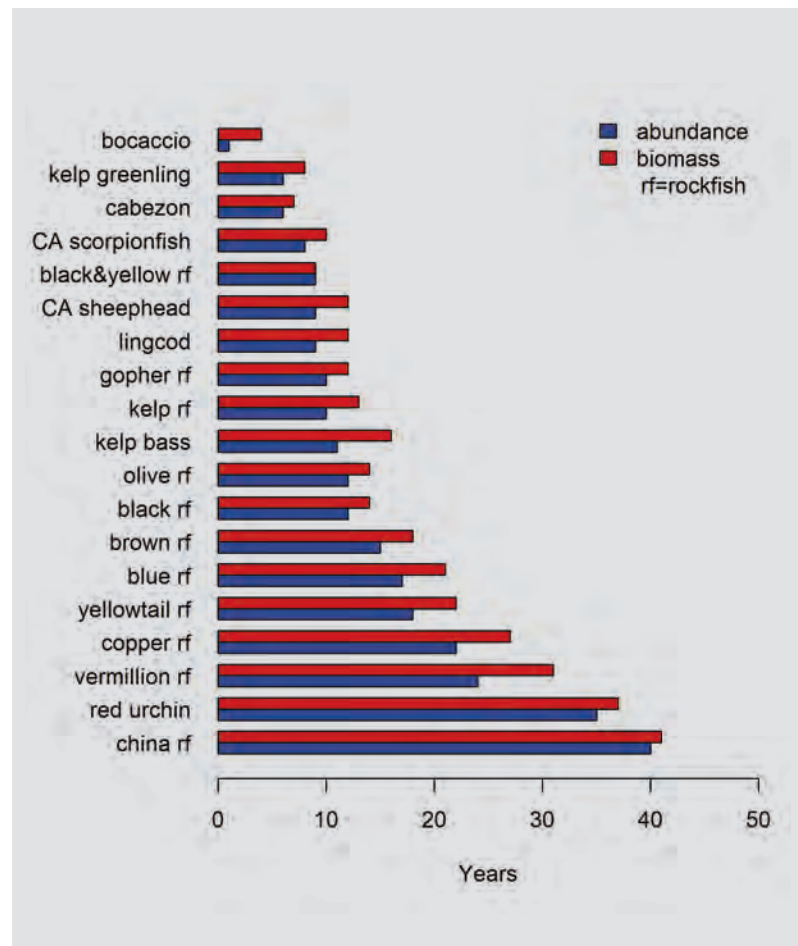
mortality rates for blue rockfish in central California and found that it varied over tens of kilometers (Figure 6). In this example, the higher pre-MPA fishing mortality ( $F = 0.29$ ) in Vandenberg SMR compared to White Rock SMCA ( $F = 0.10$ ) means that responses will be more detectable in the Vandenberg SMR. In addition, the lack of significant fishing mortality at Big Creek means that this location is unlikely to provide short-term detectable responses to MPA establishment (Figure 6). A method for estimating local per-species fishing mortality is to apply a population model that accounts for the changes in fish size before and after fishing (Figure 6; White et al. 2016). The UC Davis/CDFW postdoctoral researchers evaluated the performance of this method across species and sampling protocols to inform monitoring efforts and index site selection (Yamane, et al in prep.).



**FIGURE 6:** Spatial differences in fishing rates on blue rockfish populations before MPA implementation result in differences in expected population responses to MPAs along the central coast. Fishing rates with asterisks are from White et al. (2016); the remainder is from Nickols et al. (in review). (This figure shows preliminary analyses by the UC Davis/CDFW postdoctoral researchers. Manuscripts detailing methodology and results are in preparation.)

### ANALYSIS 3: Estimating the Time Frame of Response for Different Species

The time frame for select species population responses to MPA protection depends on a variety of factors, including, but not limited to, species life history traits, rates of fishing mortality before MPA implementation, unique ecological characteristics of the MPA, and unexpected ecological events (Lester et al. 2009, Babcock et al. 2010, Gaines et al. 2010, Moffitt et al. 2013, White et al. 2013, Caselle et al. 2015, Starr et al. 2015, White et al. 2016). The time frame for reaching the maximum expected changes in abundance and biomass for 19 commonly targeted nearshore species was generated using an age-structured open population model (Figure 7, Kaplan et al. in prep). The model relies on individual species life history traits and expected harvest rates (i.e., averaged fishing mortality rates from stock assessments across years prior to MPA implementation). In addition to the factors noted above, the time frame for responses depends on monitoring program design and feasibility (i.e., sufficient sample size and scale, where species densities will inevitably set a limit on sampling). Figure 7 therefore provides initial insight into when monitoring might detect expected effects to inform adaptive management. Ongoing investigations by the UC Davis/CDFW postdoctoral researchers are further elucidating the roles of recruitment variability and sampling (Kaplan et al in prep., Perkins et al in prep., Yamane et al in prep.).



**FIGURE 7:** Estimated time to reach 95% of final abundance (unfished state), and biomass ratio increase in response to MPA implementation based on a deterministic open population model. rf = rockfish. (This figure shows preliminary analyses by the UC Davis/CDFW postdoctoral researchers. Manuscripts detailing methodology and results are in preparation).



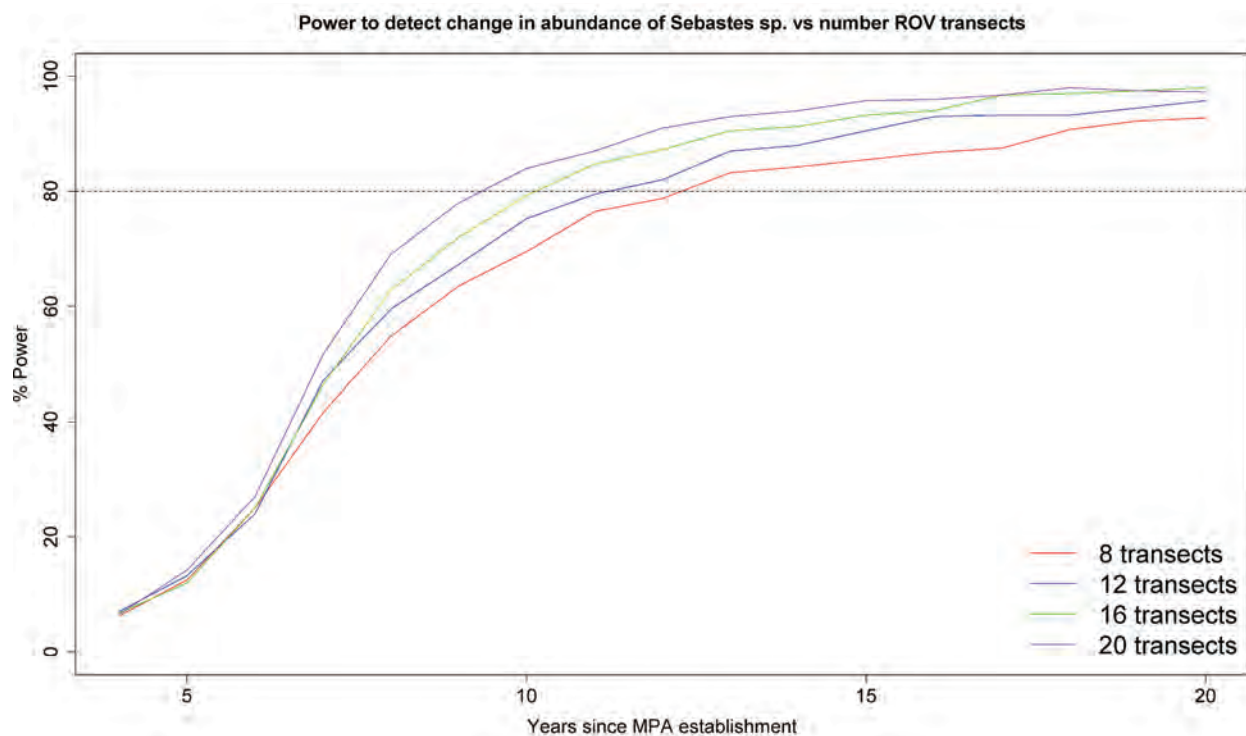
## ANALYSIS 4: Informing Long-Term Monitoring Sampling Design

### Informing Sample Design for Deep-Water Surveys

Understanding the relationship between sampling effort and the ability to detect change is an additional component of establishing an effective monitoring program (Urquhart 2012). Ecological systems are inherently variable, and additional variability introduced through sampling methods can make detecting long-term trends (e.g., recovery of populations inside MPAs) more difficult. Simulation approaches provide a powerful tool that enables researchers to incorporate the best available scientific knowledge about the system under study, and explore how various factors (i.e. spatial distributions, habitat associations, recruitment variability and likely rates of recovery of populations) interact with the level of sampling effort likely required to detect change.

Mid-depth (30-100 m) and deep (>100 m) habitats, which lie outside of practical SCUBA diving depth

limits, comprise more than half of California's MPA Network. Visual tools such as ROVs provide a means of collecting geo-referenced data about biological communities at these depths. For example, combining ROV data with fine-scale data from seafloor mapping projects allows models of habitat associations to be built for species of interest (Young et al. 2010, Wedding & Yoklavich 2015). These models can be used to predict the abundance and distribution of species across larger areas, such as an entire MPA. Moreover, combining this information with projections of expected species recovery inside MPAs compared to reference sites (see section 2.2) allows for realistic simulation of changing population abundance and size structure through time. By utilizing simulation-based approaches to explore the influence of using different numbers of ROV transects during monitoring to detect projected changes, this type of work can result in practical recommendations regarding the level of sampling required for effective long-term monitoring of California's MPA Network using ROVs (Figure 8).



**FIGURE 8:** Statistical power to detect change in abundance of *Sebastes* spp. vs number of remotely operated vehicle transects. Example plot showing the trade-off between sampling effort (number of transects) and the ability to detect statistical difference in abundance of an example rockfish species over time in an MPA compared to a paired reference site. (This figure shows preliminary analyses by the UC Davis/CDFW postdoctoral researchers. Manuscripts detailing methodology and results are in preparation.)



### Comparisons of Various Fish Monitoring Techniques

In California, various types of techniques are being used for monitoring nearshore marine ecosystems and MPAs, including SCUBA surveys, experimental fishing, ROVs, manned submersibles, and drop cameras/landers. These monitoring techniques are utilized at different depths and may capture species, or particular life history stages of species, that are unique to a certain monitoring technique or common with other monitoring techniques.

Performing a methodological comparison of various fish monitoring techniques will provide information regarding the species commonly captured by these techniques, potential species dynamics such as ontogenetic habitat shifts where individuals spend their early life in shallow areas then move to deeper areas as they grow bigger, potential depth and latitudinal range of the species, and so on. This information will be useful to ensure that any particular monitoring technique is effective for selected indicator species. Ideally, methodological comparisons will enable managers to identify a suite of techniques that can be used to monitor certain indicator species or identify synergies among different monitoring techniques to collectively inform statuses of indicator species. Combining complementary data from different monitoring techniques that often operate at different time periods, geographic regions, and depths may enhance monitoring frequency and extent in cost-effective ways while potentially providing more meaningful information for assessment and management.

### BOX 4: Key Conclusions for Monitoring Expectations

- Simulating the abundance and biomass responses to MPAs, as they arise from a “filling in” of older ages and larger sizes, can inform the choice of indicator species (Figure 7), sampling locations (Figure 6), and estimation of decision timing (Figure 7) for monitoring and adaptive management.
- Response of biomass is always greater than response of abundance.
- The ability to correctly detect differences in population dynamics within and outside MPAs increases over time, where the projected time scales of 19 species responses range from 5 to 40 years.
- Abundance and biomass responses to MPA implementation increase with greater local fishing mortality, which can vary on scales of tens of kilometers (Figure 6).
- The level of monitoring sampling effort determines the statistical power needed to detect change in populations over time (Figure 8).

## 4. Conclusion

**SINCE MPA IMPLEMENTATION**, there has been ongoing work to develop quantitative and expert informed approaches to long-term monitoring (CDFW 2016). Using knowledge from the MPA design and siting process, baseline monitoring projects, additional scientific studies in California's MPAs over the past decade, and other emerging scientific tools, the Action Plan identifies a priority list of metrics, habitats, sites, and species for long-term monitoring to aid in the evaluation of the Network's progress towards meeting the goals of the MLPA.

### Key MPA Performance Metrics

MPA monitoring from around the world has identified certain ecological, physical, chemical, and human use metrics as the most important for evaluating and interpreting MPA performance. The metrics identified in Section 2.3 are recommended for long-term monitoring to help advance the understanding of conditions and trends across the MPA Network.

### Key Habitats and Human Uses

Analyses have indicated that the habitats targeted in the MLPA planning process were successful in achieving representation and replication targets. These habitats are therefore recommended for long-term monitoring, as are both consumptive and non-consumptive human uses (Section 2.3).

### Index Sites

Using MPA design criteria, historical monitoring, connectivity modeling, and high resolution recreational fishing effort, MPAs were sorted into one of three tiers to identify which MPAs are good candidates for detecting the potential effects of protection over time (Section 2.3). This tiered approach was designed to create scalable monitoring options, allowing projects to be tailored to available resources and capacity.

### Indicator Species

California's MPA Network was implemented, in part, to help conserve ecologically and economically important marine species, as well as to protect the structure and function of marine ecosystems. To that end, this Action Plan provides lists of species and species groups to target for long-term monitoring at MPA and reference sites (Tables 7-10). These lists of fishes, invertebrates, algae and plants, and birds were compiled using several sources, including regional monitoring plans, results from workshops, and the MLMA Master Plan.

This Action Plan should be viewed as a living document. Developed based on the best available science, and informed by peer-review and public input, the document can and will be updated as needed to serve as a guide for long-term monitoring across the entire state (CDFW 2016). These updates will ensure the latest understanding of MPA Network performance evaluation is reflected in the priorities of the Monitoring Program.

## 5. Glossary

**Abiotic:** Non-living, physical components of the environment that influence organisms and their habitats. Examples include temperature, wind, sunlight, and other physical oceanographic factors such as water density and movement, wave action, salinity, and nutrient availability.

**Abundance:** The total number of individual organisms present in a given area.

**Adaptive Management:** With regard to the marine protected areas, adaptive management is a management policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as tools for learning. Actions shall be designed so that, even if they fail, they will provide useful information for future actions, and monitoring and evaluation shall be emphasized so that the interaction of different elements within marine systems may be better understood (FGC §2852(a)).

**Areas of Special Biological Significance (ASBS):** Ocean areas that are monitored and maintained for water quality by the State Water Resources Control Board. Currently, there are 34 ASBSs in California that support a variety of aquatic life and are primarily focused on regulation of coastal discharges.

**Before-After Control-Impact Analyses (BACI):** Type of study design that examines the conditions of an area(s) before and after protection (“impact”) and compares these conditions over time to those at a reference site(s) (“control”) that is not protected (Stewart-Oaten et al. 1986, Block et al. 2001).

**Benthic:** Organisms and communities that live on and in the ocean floor.

**Biodiversity:** A component and measure of ecosystem health and function. It is the number and genetic richness of different individuals found within the population of a species, of populations found

within a species range, of different species found within a natural community or ecosystem, and of different communities and ecosystems found within a region (PRC §12220(b)).

**Biomass:** The total mass of organisms in a specified area.

**Biotic:** Components of the environment that are attributed to living organisms. Examples include plants, animals, algae, primary production, predation, parasitism, competition, etc.

**California Current Large Marine Ecosystem (CCLME):** A marine region in the North Pacific Ocean from southern British Columbia, Canada to Baja California, Mexico. The CCLME is one of only four temperate upwelling systems in the world, considered globally important for biodiversity because of its high productivity and the large numbers of species it supports.

**Community Structure:** The types and number of species present in a community, which is influenced by interactions between species and other environmental factors.

**Density:** The number of individual organisms per unit area or volume in a specified area.

**Dissolved Oxygen:** Oxygen that dissolves into ocean water, absorbed from the atmosphere or the release of oxygen during photosynthesis of marine plants and algae. Dissolved oxygen is critical for marine organisms; levels in the nearshore environment are affected by physical factors such as changes in temperature and salinity.

**Ecosystem:** The physical and climatic features and all the living and dead organisms in an area that are interrelated in the transfer of energy and material, which together produce and maintain a characteristic type of biological community (CDFW 2002).



**Fishing Mortality:** The removal of fish from a population due to fishing activities. Denoted as “F” in fisheries stock assessment and other related models.

**Functional Diversity:** The components of biodiversity that influence ecosystem function. It is a measure of value and range of traits attributed to an organism or groups of organisms and how that influences ecosystem dynamics such as stability, productivity, and trophic pathways (Tilman 2001, Laureto et al. 2015, Soykan & Lewison 2015).

**Measure:** ascertain the size, amount, or degree of (something) by using an instrument or device marked in standard units or by comparing it with an object of known size.

**Metric:** a calculated or composite measure or quantitative indicator based upon two or more indicators or measures.

**Natural Mortality:** Removal of fish from a population due to causes unrelated to fishing, such as predation, diseases and other natural factors, or pollution. Denoted as “M” in fisheries stock assessment models.

**Pelagic:** The zone in the ocean composed of the water column above the ocean floor.

**pH:** A measurement (from 0 to 14) of how acidic or basic a substance is. The lower the pH of a substance, the more acidic; the higher the pH, the more basic.

**Size Frequency:** The number of individual organisms that fall into a specific size class.

**Stability:** For the purposes of this Action Plan, ecosystem stability is a measure of ecosystem response over time. A “stable” ecosystem does not experience large changes in community structure and function due to disturbances or effects of other abiotic and biotic factors. Population stability applies to a single species, and refers to changes to a population’s abundance and biomass over time (McCann 2000, Worm et al. 2006, Stachowicz et al. 2007).

**Total Alkalinity:** The concentration of alkaline substances in ocean water, such as bicarbonate ( $\text{HCO}_3^-$ ), which denotes the water’s ability to resist changes in pH.

**Trophic Cascade:** Indirect interactions that occur when changes in abundance of a predator alter the behavior of organisms at lower trophic levels, which can in turn cause dramatic changes in ecosystem structure and function (Pinnegar et al. 2002).

**Upwelling:** A process that occurs when winds push ocean surface water offshore and cold, nutrient-rich water from the deep sea rises up to the surface to replace it.



## 6. Literature Cited

- Ahmadia GN, Glew L, Provost M, Gill D, Hidayat NI, Mangubhai S, Fox HE. 2015. Integrating impact evaluation in the design and implementation of monitoring marine protected areas. *Philosophical Transactions of the Royal Society B*. 370(1681):20140275.
- Allen LG, Pondella DJ, Horn MH (eds). 2006. *The Ecology of Marine Fishes: California and Adjacent Waters*. Berkeley: University of California Press.
- Anderson K. 2005. *Trending the Wild: Native American Knowledge and the Management of California's Natural Resources*. Berkeley and Los Angeles: University of California Press.
- Anderson LWJ. 2007. Control of invasive seaweeds. *Botanica Marina*. 50:418–437. DOI 10.1515/BOT.2007.045.
- Babcock RC, Shears N, Alcala AC, Barrett NS, Edgar GJ, Lafferty KD, McClanahan TR, Russ GR. 2010. Decadal trends in marine reserves reveal differential rates of change in direct and indirect effects. *Proceedings of the National Academy of Sciences of the United States of America*. 107(43):18256–18261.
- Baskett ML, Barnett LA. 2015. The ecological and evolutionary consequences of marine reserves. *Annual Review of Ecology, Evolution, and Systematics*. 46:49–73.
- Beck MW, Heck KL, Able KW, Childers DL. 2001. The identification, conservation, and management of estuarine and marine nurseries for fish and invertebrates. *Bioscience*. 51(8):633–641.
- Berkes F. 1999. *Sacred ecology: Traditional Ecological Knowledge and Management Systems*. Philadelphia and London: Taylor and Francis.
- Blanchette CA, Denny MW, Engle JM, Helmuth B, Miller LP, Nielsen KJ, Smith J. 2016. Intertidal, in *Ecosystems of California: A Source Book*. Mooney H, Zavaleta E (eds). Berkeley: University of California Press.
- Block B, Jonsen ID, Jorgensen SJ, Winship AJ, Shaffer SA, Bograd SJ, Hazen EL, Foley DG, Breed GA, Harrison AL, Ganong JE, Swithenbank A, Castleton M, Dewar H, Mate BR, Shillinger GL, Schaefer KM, Benson SR, Weise MJ, Henry RW, Costa DP. 2011. Tracking apex marine predator movements in a dynamic ocean. *Nature*. 475:86–90. DOI:10.1038/nature10082
- Block WM, Franklin AB, Ward JP, Ganey JL, White GC. 2001. Design and implementation of monitoring studies to evaluate the success of ecological restoration on wildlife. *Restoration Ecology*. 9(3):293–303.
- Bjorkstedt EP, Garcia-Reyes M, Losekoot M, Sydeman W, Largier J, Tissot B. 2017. Oceanographic context for baseline characterization and future evaluation of the MPAs along California's North Coast. A technical report to California Sea Grant.
- Bograd S, Hazen EL, Maxwell SM, Leising AW, Bailey H, Brodeur RD. 2016. The Offshore Ecosystem. Mooney H, Zavaleta E (eds). *Ecosystems of California*. Berkeley: University of California Press.
- Bond AB, Stephens JS, Pondella DJ, Allen JM, Helvey M. 1999. A method for estimating marine habitat values based on fish guilds, with comparisons between sites in the Southern California Bight. *Bulletin of Marine Science*. 64(2):219–242.

- Broitman BR, Kinlan BP. 2006. Spatial scales of benthic and pelagic producer biomass in a coastal upwelling ecosystem. *Marine Ecology Progress Series*. 327:15–25.
- Bruno JF, Bates AE, Cacciapaglia EP, Amstrup SC, van Hooidonk R, Henson SA, Aronson RB. 2018. Climate change threatens the world's marine protected areas. *Nature Climate Change*. 8:499–503.
- California Department of Fish and Wildlife. 2002. Nearshore Fishery Management Plan. California Natural Resources Agency, California Department of Fish and Wildlife, Marine Region.
- California Department of Fish and Wildlife. 2008. Draft California Marine Life Protection Act Master Plan for Marine Protected Areas. Adopted by the California Fish and Game Commission in February 2008.
- California Department of Fish and Wildlife. 2016. California Marine Life Protection Act Master Plan for Marine Protected Areas. Adopted by the California Fish and Game Commission on August 24, 2016. Retrieved from [www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan](http://www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan).
- California Department of Fish and Wildlife. 2018 Master Plan for Fisheries: A Guide for Implementation of the Marine Life Management Act.
- Carr MH, Reed DC. 2015. Chapter 17: Shallow Rocky Reefs and Kelp Forests. Mooney H, Zavaleta E (eds). *Ecosystems of California*. Berkeley: University of California Press.
- Caselle JE, Rassweiler A, Hamilton SL, Warner RR. 2015. Recovery trajectories of kelp forest animals are rapid yet spatially variable across a network of temperate marine protected areas. *Scientific Reports*. 5:1–14.
- Charton JAG, Ruzafa ÁP. 1999. Ecological heterogeneity and the evaluation of the effects of marine reserves. *Fisheries Research*. 42(1-2):1–20.
- Charton JAG, Williams ID, Ruzafa AP, Milazzo M, Chemello R, Marcos C, Kitsos MS, Koukouras A, Riggio S. 2000. Evaluating the ecological effects of Mediterranean marine protected areas: habitat, scale and the natural variability of ecosystems. *Environmental Conservation*. 27(02):159–178.
- Checkley DM, Barth JA. 2009. Patterns and processes in the California Current System. *Progress in Oceanography*. 83(1-4):49–64.
- Cinner JE, Huchery C, MacNeil MA, Graham NA, McClanahan TR, Maina J, Maire E, Kittinger N, Hicks CC, Mora C, Allison EH. 2016. Bright spots among the world's coral reefs. *Nature*. 535(7612):416.
- Cinner J, Fuentes MMPB, Randriamahazo H. 2009. Exploring social resilience in Madagascar's marine protected areas. *Ecology and Society*. 14(1):41
- Claudet J, Osenberg CW, Benedetti-Cecchi L, Domenici P, García-Charton JA, Pérez-Ruzafa Á, Badalamenti F, Bayle-Sempere J, Brito A, Bulleri F. 2008. Marine reserves: Size and age do matter. *Ecology Letters*. 11:481–489.
- Cloern JE, Jassby AD. 2012. Drivers of change in estuarine-coastal ecosystems: discoveries from four decades of study in San Francisco Bay. *Reviews of Geophysics*. 50(4):1–33.
- Cloern JE, Barnard PL, Beller E, Callaway JC, Grenier JL, Grosholz ED, Grossinger R, Hieb K, Hollibaugh JT, Knowles N. 2016. Life on the Edge—California's Estuaries. Mooney H, Zavaleta E (eds). *Ecosystems of California: A Source Book*. Berkeley: University of California Press.
- Cloern JE, Jassby AD, Schraga TS, Nejad E, Martin C. 2017. Ecosystem variability along the estuarine salinity gradient: examples from long-term study of San Francisco Bay. *Limnology and Oceanography*. 62:S272–S291.

- Davenport J, Davenport JL. 2006. The impact of tourism and personal leisure transport on coastal environments: a review. *Estuarine, Coastal and Shelf Science*. 67(1):280–292.
- Derraik JGB. 2002. The pollution of the marine environment by plastic debris: a review. *Marine Pollution Bulletin*. 44(9):842–852.
- Dugan JE, Hubbard DM. 2016. *Sandy Beaches*. Mooney H, Zavaleta E (eds). *Ecosystems of California: A Source Book*. Berkeley: University of California Press.
- Echeveste PJ, Dachs J, Berrojalbiz N, Agusti S. 2010. Decrease in the abundance and viability of oceanic phytoplankton due to trace levels of complex mixtures of organic pollutants. *Chemosphere*. 81:161–168.
- Fox HE, Holtzman JI, Haisfield KM, McNally CG, Cid GA, Mascia MB, Parks JE, Pomeroy RS. 2014. How are our MPAs doing? Challenges in assessing global patterns in marine protected area performance. *Coastal Management*. 42(3):207–226, DOI: 10.1080/08920753.2014.904178
- Fulton CJ, Noble MN, Radford B, Gallen C, Harasti D. 2016. Microhabitat selectivity underpins regional indicators of fish abundance and replenishment. *Ecological Indicators*. 70:222–231.
- Gaines SD, White C, Carr MH, Palumbi SR. 2010. Designing marine reserve networks for both conservation and fisheries management. *Proceedings of the National Academy of Sciences*. 107(43):18286–18293.
- Gell FR, Roberts CM. 2003. Benefits beyond boundaries: the fishery effects of marine reserves. *Trends in Ecology & Evolution*. 18(9):448–455.
- Gleason M, Fox E, Ashcraft S, Vasques J, Whiteman E, Serpa P, Saarman E, Caldwell M, Frimodig A, Miller-Henson M, Kerlin J, Ota B, Pope E, Weber M, Wiseman K. 2013. Designing a network of marine protected areas in California: achievements, costs, lessons learned, and challenges ahead. *Ocean & Coastal Management*. 74:90–101.
- Giakoumi S, Scianna C, Plass-Johnson J, Micheli F, Grorud-Colvert K, Thiriet P, Claudet J, Di Carlo G, Di Franco A, Gaines SD, Garcia-Charton AA, Lubchenko J, Reimer J, Sala E, Guidetti P. 2017. Ecological effects of full and partial protection in the crowded Mediterranean Sea: a regional meta-analysis. *Scientific Reports*. 7:1–12.
- Golightly RT, Barton DC, Robinette D. 2017. Comprehensive seabird monitoring for the characterization and future evaluation of marine protected areas in California's North Coast Study Region. Final technical report to California Sea Grant for the California North Coast MPA Baseline Monitoring Program (Project R/MPA-35).
- Hamilton SL, Caselle JE, Malone DP, Carr MH. 2010. Incorporating biogeography into evaluations of the Channel Islands marine reserve network. *Proceedings of the National Academy of Sciences*. 107(43):18272–18277.
- Hughes BB. 2017. *Estuarine & Wetland Ecosystems: The First Steps in Developing an Approach to Leveraging Existing Monitoring Programs*. Report to California Ocean Science Trust, Oakland, CA USA.
- Hughes BB, Levey MD, Fountain MC, Carlisle AB, Chavez FP, Gleason MG. 2015. Climate mediates hypoxic stress on fish diversity and nursery function at the land–sea interface. *Proceedings of the National Academy of Sciences*. 112:8025–8030.
- Laist DW. 1987. Overview of the biological effects of lost and discarded plastic debris in the marine environment. *Marine Pollution Bulletin*. 18:319–326.



- Laureto LMO, Cianciaruso MV, Samia DSM. 2015. Functional diversity: an overview of its history and applicability. *Natureza & Conservacao*. 13(2):112-116.
- Lester SE, Halpern BS. 2008. Biological responses in marine no-take reserves versus partially protected areas. *Marine Ecology Progress Series*. 367:49-56.
- Lester SE, Halpern BS, Grorud-Colvert K, Lubchenco J, Ruttenberg BI, Gaines SD, Warner RR. 2009. Biological effects within no-take marine reserves: a global synthesis. *Marine Ecology Progress Series*. 384:33-46.
- Lindgren M, Checkley Jr DM, Koslow JA, Goericke R, Ohman MD. 2018. Climate-mediated changes in marine ecosystem regulation during El Niño. *Global Change Biology*. 24:796-809.
- Lindholm J, Auster P, Valentine P. 2004. Role of a large marine protected area for conserving landscape attributes of sand habitats on Georges Bank (NW Atlantic). *Marine Ecology Progress Series*. 269:61-68.
- Lloret J, Zaragoza N, Caballero D, Riera V. 2008. Impacts of recreational boating on the marine environment of Cap de Creus (Mediterranean Sea). *Ocean & Coastal Management*. 51(11):749-754.
- Love MS, Yoklavich M, Schroeder DM. 2009. Demersal fish assemblages in the Southern California Bight based on visual surveys in deepwater. *Environmental Biology of Fishes*. 84:55-68.
- McArdle DA. 1997. California Marine Protected Areas. California Sea Grant College System, La Jolla, California. Publication No. T-039
- McArdle DA. 2002. California Marine Protected Areas: Past & Present. California Sea Grant College System Publication. La Jolla, California.
- McCann KS. 2000. The diversity-stability debate. *Nature*. 405:228-233.
- McChesney GJ, Robinette D. 2013. Baseline Characterization of Newly Established Marine Protected Areas Within the North Central California Study Region—Seabird Colony and Foraging Studies. Final technical report to California Sea Grant for the California North Central Coast MPA Baseline Monitoring Program (Project R/MPA-6).
- McGowan JA, Bograd SJ, Lynn RJ, Miller AJ. 2003. The biological response to the 1977 regime shift in the California Current. *Deep Sea Research Part II: Topical Studies in Oceanography*. 50(14-16):2567-2582.
- Menge BA, Daley BA, Wheeler PA, Strub PT. 1997. Rocky intertidal oceanography: an association between community structure and nearshore phytoplankton concentration. *Limnology and Oceanography*. 42(1):57-66.
- Menge BA, Lubchenco J, Bracken MES, Chan F, Foley MM, Freidenburg TL, Gaines SD, Hudson G, Krenz C, Leslie H, Menge DNL, Russel R, Webster MS. 2003. Coastal oceanography sets the pace of rocky intertidal community dynamics. *Proceedings of the National Academy of Sciences*. 100:12229-12234.
- Micheli F, Halpern BS, Botsford LW, Warner RR. 2004. Trajectories and correlates of community change in no-take marine reserves. *Ecological Applications*. 14(6):1709-1723.
- MLPA Science Advisory Team. 2008. Methods used to evaluate marine protected area proposals in the north central coast study region. Marine Life Protection Act Initiative, May 30, 2008 revised draft.

- MLPA Science Advisory Team. 2009. Methods used to evaluate marine protected area proposals in the north central coast study region. Marine Life Protection Act Initiative, October 26, 2009 revised draft.
- MLPA Science Advisory Team. 2011. Methods used to evaluate marine protected area proposals in the north central coast study region. Marine Life Protection Act Initiative, January 13, 2011 revised draft.
- Moffitt EA, White JW, Botsford LW. 2013. Accurate assessment of marine protected area success depends on metric and spatiotemporal scale of monitoring. *Marine Ecology Progress Series*. 489:17–28.
- Moore AM, Arango HG, Broquet G, Powell BS, Weaver AT, Zavala-Garay J. 2011. The Regional Ocean Modeling System (ROMS) 4-dimensional variational data assimilation systems: Part I—System overview and formulation. *Progress in Oceanography*. 91(1):34–49.
- Nickols KJ, Miller SH, Gaylord B, Morgan SG, Largier JL. 2013. Spatial differences in larval abundance within the coastal boundary layer impact supply to shoreline habitats. *Marine Ecology Progress Series*. 494:191–203.
- Ocean Protection Council. 2014. The California Collaborative Approach: Marine Protected Areas Partnership Plan. [http://www.opc.ca.gov/webmaster/ftp/pdf/docs/mpa/APPROVED\\_FINAL\\_MPA\\_Partnership\\_Plan\\_12022014.pdf](http://www.opc.ca.gov/webmaster/ftp/pdf/docs/mpa/APPROVED_FINAL_MPA_Partnership_Plan_12022014.pdf)
- Ocean Protection Council. 2015. MPA Statewide Leadership Team Work Plan. [http://www.opc.ca.gov/webmaster/ftp/pdf/agenda\\_items/20150922/Item5\\_Attach2\\_MPALeadershipTeam\\_Workplan\\_FINALv2.pdf](http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20150922/Item5_Attach2_MPALeadershipTeam_Workplan_FINALv2.pdf)
- Oliver T, Roy DB, Hill JK, Brereton T, Thomas CD. 2010. Heterogeneous landscapes promote population stability. *Ecology Letters*. 13(4):473–484.
- Paddock MJ, Estes JA. 2000. Kelp Forest Fish Populations in Marine Reserves and Adjacent Exploited Areas of Central California. *Ecological Applications*. 10(3):855–870.
- Pastorok RA, Bilyard GR. 1985. Effects of sewage pollution on coral-reef communities. *Marine Ecology Progress Series*. 21:175–189.
- Pinnegar JK, Polunin NVC, Francour P, Badalamenti F. 2002. Trophic cascades in benthic marine ecosystems: lessons for fisheries and protected-area management. *Environmental Conservation*. 27(2):179–200.
- Raimonet M, Cloern JE. 2016. Estuary-ocean connectivity: fast physics, slow biology. *Global Change Biology*. 23(6):2345–2357.
- Ralston S, O’Farrell MR. 2008. Spatial variation in fishing intensity and its effect on yield. *Canadian Journal of Fisheries and Aquatic Sciences*. 65(4):588–599.
- Robinette D, Howar J, Elliott ML, Jahncke J. 2015. Use of estuarine, intertidal, and subtidal habitats by seabirds within the MLPA South Coast Study Region. Final technical report to California Sea Grant for the California South Coast MPA Baseline Monitoring Program (Project R/MPA-28).
- Robinette DP, Howar J, Claisse JT, Caselle JE. 2018. Can nearshore seabirds detect variability in juvenile fish distribution at scales relevant to managing marine protected areas? *Marine Ecology*. 39:e12485.
- Ruzicka JJ, Brodeur RD, Emmett RL, Steele JH, Zamon JE, Morgan CA, Wainwright TC. 2012. Interannual variability in the Northern California Current food web structure: Changes in energy flow pathways and the role of forage fish, euphausiids, and jellyfish. *Progress in Oceanography*. 102:19–41.

- Saarman ET, Gleason M, Ugoretz J, Airame S, Carr MH, Fox E, Frimodig A, Mason T, Vasques J. 2013. The role of science in supporting marine protected area network planning and design in California. *Ocean & Coastal Management*. 74:45–56.
- Saarman ET, Owens B, Murray SN, Weisberg SB, Ambrose RF, Field JC, Nielsen KJ, Carr MH. 2018. An ecological framework for informing permitting decisions on scientific activities in protected areas. *PLOS ONE*. 13(6):e0199126. <https://doi.org/10.1371/journal.pone.0199126>.
- Schiel DR, Foster MS. 2015. The biology and ecology of giant kelp forests. Berkeley: University of California Press.
- Shanks AL. 2009. Pelagic larval duration and dispersal distance revisited. *The Biological Bulletin*. 216(3):373–385.
- Shaughnessy FS, Mulligan T, Kramer S, Kullman S, Largier J. 2017. Baseline characterization of biodiversity and target species in estuaries along the north coast of California. Final technical report to California Sea Grant for the California North Coast MPA Baseline Monitoring Program (Project R/MPA-40A).
- Sheaves M, Baker R, Nagelkerken I, Connolly RM. 2015. True value of estuarine and coastal nurseries for fish: incorporating complexity and dynamics. *Estuaries and Coasts*. 38(2):401–414.
- Snelgrove PVR. 1997. The importance of marine sediment biodiversity in ecosystem processes. *Ambio*. 26(8):578–583.
- Soykan CU, Lewison RL. 2015. Using community-level metrics to monitor the effects of marine protected areas on biodiversity. *Conservation Biology*. 29:775–83.
- Stachowicz JJ, Bruno JF, Duffy JE. 2007. Understanding the effects of marine biodiversity on communities and ecosystems. *Annual Review of Ecology, Evolution, and Systematics*. 38:739–766.
- Starr RM, Wendt DE, Barnes CL, Marks CI, Malone D, Waltz G, Yochum N. 2015. Variation in responses of fishes across multiple reserves within a network of marine protected areas in temperate waters. *PLOS ONE*. 10(3):e0118502.
- Stephens JS, Larson RJ, Pondella DJ. 2006. Rocky Reefs and Kelp Beds. *The Ecology of Marine Fishes: California and Adjacent Waters*. Allen LG, Pondella II DJ, Horn MH (eds). Berkeley: University of California Press.
- Stewart-Oaten A, Murdoch WW, Parker KR. 1986. Environmental Impact Assessment: “pseudoreplication” in time? *Ecology*. 67(4):929–940.
- Tilman D. 2001. Functional diversity. *Encyclopedia of Biodiversity*, vol. 3. Levin SA (ed). New York: Academic Press.
- Toft JD, Munsch SH, Cordell JR, Siitari K, Hare VC, Holycross BM, DeBruyckere LA, Greene CM, Hughes BB. 2018. Impact of Multiple Stressors on Juvenile Fish in Estuaries of the Northeast Pacific. *Global Change Biology*. 24(5):2008–2020.
- Tratalos JA, Austin TJ. 2001. Impacts of recreational SCUBA diving on coral communities of the Caribbean island of Grand Cayman. *Biological Conservation*. 102(1):67–75.
- Urquhart NS. 2012. Design and Analysis of Long-term Ecological Monitoring Studies. Gitzen RA, Millsbaugh JJ, Cooper AB, Licht DS (eds). Cambridge: University Press.

- Wedding L, Yoklavich MM. 2015. Habitat-based predictive mapping of rockfish density and biomass off the central California coast. *Marine Ecology Progress Series*. 540:235-250.
- White JW, Botsford, LW, Baskett, ML. 2011. Linking models with monitoring data for assessing performance of no-take marine reserves. *Frontiers in Ecology and the Environment* 9(7):390-399.
- White J, Scholz A, Rassweiler A, Steinback C, Botsford L, Kruse S, Costello C, Mitarai S, Siegal D, Drake P, Edwards C. 2013. A comparison of approaches used for economic analysis in marine protected area network planning in California. *Ocean & Coastal Management* 74:77-89.
- White JW, Nickols KJ, Malone D, Carr MH, Starr RM, Cordoleani F, Botsford LW. 2016. Fitting state-space integral projection models to size-structured time series data to estimate unknown parameters. *Ecological Applications*. 26(8):2677-2694.
- Williams SL, Grosholz ED. 2008. The invasive species challenge in estuarine and coastal environments: marrying management and science. *Estuaries and Coasts*. 31(1):3-20. DOI <https://doi.org/10.1007/s12237-007-9031-6>
- Worm B, Barbier EB, Beaumont N, Duffy JE, Folke C, Halpern BS, Jackson JB, Lotze HK, Micheli F, Palumbi SR, Sala E. 2006. Impacts of biodiversity loss on ocean ecosystem services. *Science*. 314(5800):787-790.
- Young M, Carr M. 2015. Assessment of habitat representation across a network of marine protected areas with implications for the spatial design of monitoring. *PLOS ONE*. 10(3):e0116200.
- Young MA, Lampietro PJ, Kvitek RG, Garza CD. 2010. Multivariate bathymetry-derived generalized linear model accurately predicts rockfish distribution on Cordell Bank, California, USA. *Marine Ecology Progress Series*. 415:247-261.
- Zwolinski JP, Demer DA, Byers KA, Cutter GR, Renfree JS, Sessions TS, Macewicz BJ. 2012. Distributions and abundances of Pacific sardine (*Sardinops sagax*) and other pelagic fishes in the California Current Ecosystem during spring 2006, 2008, and 2010, estimated from acoustic-trawl surveys. *Fishery Bulletin*. 110:110-122.

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## 7. Appendices

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Appendix A:

**FUNDING  
DISBURSEMENT  
MECHANISMS**

Memorandum: Fund Disbursement Mechanisms  
Statewide MPA Monitoring Program

## Fund Disbursement Mechanisms

### About this Document

This memorandum is an overview of the processes and mechanisms by which funds could be disbursed and partnerships pursued to advance the Statewide MPA Monitoring Program. A diversity of funding disbursement mechanisms will enable State investments to be strategically targeted to maximize cost-effectiveness, transparency, and efficiency across the breadth of activities within the program. We provide specific recommendations for when to apply each mechanism, considerations, and estimated timelines for each process. Additionally, Appendix A contains templates for each of these mechanisms, and Appendix B is a more detailed memorandum focused on developing and implementing an Expressions of Interest (EOIs) process.

### Requests for Qualifications (RFQs)

#### *Description and Considerations*

A RFQ lays out a very specific project plan and solicits competitive bids for completion of the work (see Appendix A for an example). RFQs are most appropriate when the funder already has a very clearly defined need and approach to a project, for example, if the project requirements are known in great detail (e.g., sites, metrics, sampling frequency) or if the RFQ is meant to infuse funds into (or replicate) an existing monitoring program. In these more specific cases, RFQs represent a more efficient option than RFPs and ensure that program needs are met in the first solicitation. The level of review of responses to RFQs is typically less rigorous and is set against the specifics of the RFQ itself. However, for RFQs targeting high value or multi-year projects, review from an outside source knowledgeable in the project specifics may be useful to ensure that the selected response meets the requirements, sets a reasonable timeline, and upholds the scientific rigor required by the program. One potential drawback is that, although possible, highly specific RFQs may not be as well suited for finding contractors with existing monetary support that can leveraged against State funds.

RFQs typically have short open periods (2-4 weeks) and can be used for a variety of projects. For example, an RFQ could target multi-year projects to track the condition of a selected ecosystem or human use category (i.e., consumptive or non-consumptive), or focus on integrative analyses in advance of an anticipated management review. For cases in which the resulting contract extends over multiple years, annual disbursements contingent on performance can protect the State investment.

#### *Estimated time to complete*

- 2-4 week open period
- 2 weeks for internal review (add 2-3 weeks for external review)
- 1-2 weeks for revisions respondent(s) (*optional*)

**Total:** 5-11 weeks, plus time for internal contract/grant execution

Memorandum: Fund Disbursement Mechanisms  
Statewide MPA Monitoring Program

## Requests for Proposals (RFPs)

### *Description and Considerations*

When operational requirements are more loosely defined than described in the RFQ example above or when multiple approaches may be employed to address a component of monitoring, a RFP allows for more creativity and innovation on the part of applicants (see Appendix A for an example). This is a good option when there is a clearly defined goal, research, or management question, but the approach, tools, location, mechanisms, and/or experimental design are undefined/unrestricted or unknown. Ideally, RFPs allow a funder to solicit and consider a wide range of proposed technical and programmatic approaches, and select the proposal that meets identified evaluation criteria. There may be greater financial risk in this approach, but it can be valuable in stimulating innovation.

Proposals should be peer-reviewed for consideration of the evaluation criteria described in the RFP, often including scientific and technical merits, whether the proposed project meets RFP goals, and overall cost-effectiveness. Peer review processes associated with RFPs typically involve formal internal and external review steps. There are many different approaches to these peer review processes. (See Appendix 2 for examples.)

### *Estimated time to complete*

- 8-12 week open period
- 6-8 weeks for peer review process (often two steps)
- 2 weeks for proposal revision by respondent(s) (*optional*)

**Total:** 16-22 weeks, plus time for internal contract/grant execution time

## Expressions of Interest (EOI)

### *Description and Considerations*

There are two rather different situations in which EOIs are a good tool. First, EOIs are a good fit when limited funding is available and/or the intent is to provide matching funds for an existing program or research project. Second, EOIs are a useful tool when the sampling methods or other project details are unknown. In this case, the EOIs could be used to shape a RFQ or RFP. In both of these situations, EOIs can be used either as the end point (i.e., funding decisions made based on the EOIs) or to create a list of potential contractors from whom full proposals will be requested. In the former case (matching funds), full proposals may not be necessary since the respondent will have already developed a full proposal that was reviewed and funded by another source. The MPA monitoring funder could request the existing proposal as part of the EOI response package. (See Appendix A for an EOI opportunity announcement template.) Leveraging funding from other sources can help the State to move forward more quickly on research and program goals that are of interest to other funders and at the federal level as well. For example, network evaluation questions could be answered through basic research that might attract support from funders such as the National Oceanographic and Atmospheric Administration and National Science Foundation.



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EOIs can be an efficient way to solicit and understand interest, develop a standing list of vendors, and seek matching funds. However, if there is targeted or specific need that the State needs to move forward on quickly, it can add an extra step in the proposal process and may not be needed. If the main goal of the EOI process is provide matching funds to existing programs or projects, establishing a pool of funds to be used for this purpose can be a highly cost-effective approach to incentivizing relevant and useful research and monitoring. This approach can be especially useful for components of the program without strict temporal requirements, and those that would benefit from advancing knowledge and best practices and/or development of new methodologies or technologies. See Appendix B for more information on EOIs.

### *Estimated time to complete*

- 4-8 week open period
- 1-2 weeks for internal review (add 2-3 weeks for external review)
- 2-4 weeks for full proposal development by respondents (*optional*)
- 1-2 weeks for internal review (add 2-3 weeks for external review) (*if requesting full proposals*)

**Total:** 5-13 weeks (*if funds disbursed based on EOIs*), 8-22 weeks (*if requesting full proposals*), plus time for contract/grant execution time

## Sole-sourcing

### *Description and Considerations*

In limited circumstances, it can be most efficient and cost-effective to engage directly with a consultant or contractor team with unique expertise or knowledge of the project of interest. For example, sole-sourcing may be most efficient for implementing coordination and synthesis activities, consistent with the rules associated with the funding source and disbursing organization. This approach leverages existing institutional capacity and knowledge developed through the last decade of MPA implementation and MPA monitoring. This option is particularly well-suited for existing grants or contracts that the State is seeking to extend.

### *Estimated time to complete*

- 2-4 weeks for contract/grant development with consultant or contractor team

**Total:** 2-4 weeks, plus time for contract/grant execution time

## Partnerships

### *Description and Considerations*

In many cases, ongoing work by existing programs, institutions, agencies, etc. can directly provide useful data or syntheses that inform our understanding of the ocean conditions and trends inside and outside MPAs. Maintaining and building partnerships can help capitalize on these opportunities. In some cases, a partnership may involve a formal written agreement outlining specific terms and commitments (e.g.,

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memorandum of understanding). In others, the intent to work together may be reflected by mutual acknowledgment of shared interests in planning or other strategic documentation.

Partnerships can also be useful for sharing resources such as infrastructure and technology, and for collaborating on sharing monitoring results. In some cases, funding may be needed to support participation in a partnership, such as a post-doctoral fellow to conduct data analysis. Even when not directly sharing resources, partners can make a valuable contribution simply by maintaining capacity (e.g., trained technicians, databases, visualization tools), which lowers the year-to-year cost of MPA monitoring.

## Summary

Funding Mechanism	Purpose/Outcome	Duration
Request for Qualifications (RFQ)	<ul style="list-style-type: none"> <li>Clearly defined needs and approach provided by funder</li> </ul>	5-11 weeks
Request for Proposals (RFP)	<ul style="list-style-type: none"> <li>Open ended solicitation of proposals where innovative solutions or flexible solutions are preferred</li> </ul>	16-22 weeks
Expression of Interest (EOI)	<ul style="list-style-type: none"> <li>Determine interest of researchers, consultants, NGOs, etc.</li> <li>Help scope final RFP/RFQ</li> <li>Searching for leveraged funds</li> </ul>	5-22 weeks
Sole-sourcing	<ul style="list-style-type: none"> <li>Very specific contract with established or previous vendor</li> </ul>	2-4 weeks

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## Appendix A. Funding Mechanism Templates

This appendix includes templates for disbursing and implementing state funded research and monitoring for the MPA Monitoring Program through three funding mechanisms:

- Expression of Interest Opportunity (EOI) Announcement
- Request for Qualifications (RFQ) template, including selection criteria and process
- Request for Proposals (RFP) template, including selection criteria and process

The California Ocean Protection Council (OPC), California Department of Fish and Wildlife (CDFW), and California Ocean Science Trust (OST) developed these templates collaboratively.

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## Template: Expressions of Interest (EOI) Opportunity Announcement

### Summary

This template is provides the State and its partners draft language and instruction from which to draft and complete an EOI opportunity announcement and process each year, or as needed, in support of its Statewide MPA Monitoring Program.

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### Section 1: In Brief

**Instructions:** Provide a very brief synopsis of the type of funding, the amount, and the timeline. Keep to three sentences/lines, max.

**Sample Language:** OPC, CDFW, and its partners are seeking expressions of interest from research teams to address the State's long-term monitoring and research needs in relation to its extensive MPA network. *[FOCAL STATEMENT ABOUT TARGETED QUESTIONS OR R&D TOPIC AREA, ETC.]* EOIs are due on MM DD, YYYY. If selected, projects could be awarded up to \$XX.

### Section 2: Priorities for funding this cycle

**Instructions:** Create clearly stated priorities for funding. The first step in developing the EOI announcement should be to identify the priority questions/topics prior to each release. The team should work together to decide upon a timeline, process, key partners, and level of detail for developing this information. Link to any information online with the State's funding priorities, bond priorities, strategic plans, etc. for which applicants should tailor the response and research. This section should be as clear and concise as possible with a goal of 5-6 sentences max.

### Section 3: Timeline for EOIs

**Instructions:** Provide all timeline information related to submission and notification to applicants of successful EOIs invited to submit full proposals.

**Information to include:**

- Date for submission of EOIs
- Date for notification of EOIs invited to submit a full proposal

### Section 4: Submission Instructions

**Instructions:** Provide clear and concise instructions on how, where, and what to submit. Complete the information on how and where an applicant submits the EOI and then tailor the submission instructions to meet the goals and requirements of the current funding cycle, as needed.

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**Information to include:**

- Submission date
- Amount and year range for grant awards
- Where to submit applications (e.g., letter, online, email, etc.)
- Eligibility to submit (or frame as who is not eligible to apply for funds)
- Submission length and required content (select from and edit the following as needed):
  - *Team/Partners (1 paragraph)*: Request a list of the proposed project team and brief description of roles for each.
  - *Amount range; year range proposed (1 sentence)*: State the funding available through this EOI announcement, max per project (if applicable), and project timeline.
  - *Approach to the project and/or project proposal (1-2 paragraphs)*: Request a brief, high-level statement of the approach proposed (if applicant is seeking funds for a defined project, or if announcement targets a specific project that meets the priorities and goals of the particular funding cycle).
  - *Alignment with funder priorities (1 paragraph)*: Request a description of how the proposed project aligns with funder priorities (as outlined in the EOI announcement).
  - *Matching funds (1 paragraph, bulleted list, or table)*: Request a description or list of the matching funds, including other grant funds, in-kind support, etc. (either secured or submitted), that would augment the State's investment in the proposed project.
  - *Other relevant materials*: Request any of the following materials, as needed –
    - Relevant experience via resumes/curriculum vitae of project staff
    - Relevant supporting documents (e.g., funded research proposal(s) for any matching funds, letters of support from project partners)
    - List any current, pending, or potential funds (bulleted list including project title, grantor, and award amount)

**Section 5: Process for Selection of EOIs**

**Instructions:** Provide all process information related to submission, selection, and notification to applicants of successful EOIs invited to submit full proposals.

**Information to include:**

**Selection criteria:** EOIs will be scored based on the following criteria and weights. (*Select from the following list as applicable. Include weights for criteria.*)

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- Relevance and applicability to priorities of the Statewide MPA Monitoring Program (20%): Assessment of alignment of project goals with the MPA Program purposes and priorities and stated priorities for the current funding cycle.
- Scientific/technical merit (20%): The degree to which the proposed project is innovative and will advance the state of the science or discipline through rigorous state-of-the-art research.
- Users, Participants, and Partnerships (20%): The degree to which users or potential users of the results of the proposed project have been brought into the planning of the project, will be brought into the execution of the project, and will use results. Researchers must work with end-users to develop relevant proposals. Demonstrated knowledge, partnerships, relationships, collaborations or other mechanisms for bringing users and partners into the project.
- Project costs and funding leverage (5%): Description of funds already leveraged or under development for the proposed project. Demonstrated efficiencies in data collection, partnerships, etc.
- Qualifications of project lead(s) and demonstrated access to facilities and resources (10%): Assessment of whether the applicants possess the necessary knowledge, experience, training, facilities, and resources to complete the project
- Project management experience, expertise, and skills (10%): Assessment of project management experience, including a proven track record in completing contracts on-time and within budget; and experience managing and working in multi-party, multidisciplinary teams. Demonstrated list of grants, bringing things to fruition, deliver on contracts, grants, etc.
- Timeliness/Urgency of the Research (5%): Due to changing ocean conditions as a result of both human and natural causes, priority given to research addressing issues needing immediate attention can arise and are not amenable to waiting until the next funding cycle.
- Proof of Concept/Preliminary Data (10%): Does the proposal have proof of concept through a previously funded or currently funded pilot project? Does it already have preliminary data in hand to hone a research proposal or leverage existing data?

**Process for evaluating the selection criteria (2-3 sentences)**

- Information about review process (e.g., panel/committee, independent reviewers, state agency representatives, etc.)
- Information about how the review process will operate (e.g., scoring, entity with final decision-making authority)

## Contact

Questions may be directed to [NAME], [TITLE], [ORGANIZATION], at [EMAIL] or [PHONE].

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## Template: Request for Qualifications (RFQ)

### Section 1: Summary

**Instructions:** This section will provide a high-level summary of the work, objectives, and submission deadline.

**Sample Language:** The [AGENCY/ORGANIZATION] is seeking qualified contractors or teams of contractors (Contractor(s)) to support [DESCRIBE THE WORK, BRIEFLY, HERE]. [ADD 1-2 SENTENCES, AS NEEDED, TO PROVIDE ADDITIONAL DETAILS] Professional services under this Request for Qualifications will focus on [#] main objectives: [OBJECTIVE 1], and [OBJECTIVE 2]. The deadline for receipt of submissions is [TIME] PST on [DATE].

### Section 2: Background

**Instructions:** This section will include a description of the organization issuing the RFQ, brief overview of the policy guidance (e.g., MLPA, MLPA Master Plan, Partnership Plan), introduction to the other documents (e.g., workplan, monitoring plan), and where to find additional background information.

### Section 3: Description of Work

**Instructions:** This section will include objectives, a summary of the work (including a list of recommended sites), an outline of expected deliverables and major milestones, and the main tasks associated with the work.

### Section 4: Qualifications, Skills, and Expertise

**Sample Language:** The [AGENCY/ORGANIZATION] seeks Contractor(s) with the expertise, demonstrated skills, and proven experience necessary to conduct the MPA monitoring activities described above. Expertise, skills, and experience [TIE TO DESCRIPTION OF WORK] and should include the following:

- Extensive experience, rigorous theoretical grounding and proven success in designing and implementing scientific monitoring activities
- [RELEVANT TOPICAL EXPERTISE, e.g., kelp forest ecology, rocky intertidal ecology]
- Proven experience building and stewarding broad collaborations among diverse organizations and across disciplines
- Demonstrated excellence in project management and client communication, including proven ability to develop high-quality deliverables and to work within established project timelines and budget.
- Ability to communicate effectively with a broad range of stakeholders a plus
- [ADD ADDITIONAL EXPERTISE, SKILLS, AND EXPERIENCE, AS RELEVANT/IDENTIFIED]



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## Section 5: Terms

**Sample Language:** Contactors will report directly to the [ORGANIZATION] [POSITION/TITLE] and will receive organized advice from [ORGANIZATION] staff and partners. Contractors will be expected to coordinate effectively with the [ORGANIZATION] using electronic and telephone communication, on-line collaboration tools, in-person meetings, or other appropriate means. The selected Contractors will provide services through [DATE] on a contract basis. The fee will be negotiated at the time of selection.

## Section 6: Submission Requirements

**Sample Language:** Respondents should submit their qualifications electronically to [AGENCY/ORGANIZATION] no later than [DATE]. Submissions should be sent by email to ([EMAIL ADDRESS]) with subject line “Response to Statewide Monitoring RFQ”.

All submittals must include:

1. A cover letter
2. A statement demonstrating the applicant’s understanding of the project, indicating how the applicant meets the desired qualifications, skills and experience
3. An overview of the proposed scope of work and project approaches and key components, including a proposed schedule with approximate schedule or timing of key milestones
4. A description of the applicant’s qualifications, such as a resume
5. A statement of availability and loaded daily or hourly rates including fringe and overhead through [DATE].
6. A minimum of three references relating to completed projects for the services being requested with full name, title, address, and phone numbers.

Submissions should be no longer than 15 pages. Additional pages are permissible only if or as needed to provide resumes of key personnel. Submissions should be provided as a single electronic file, ideally in PDF format.

## Section 7: Submission Review & Selection Process

**Sample Language:** [AGENCY/ORGANIZATION] will evaluate submissions against the following criteria:

- 1) *Relevance and applicability to the objectives of the Statewide MPA Monitoring Program:* Assessment of alignment of project goals with the Monitoring Program objectives, including:
  - Efficiencies in data collection to address multiple program priorities
  - Ability to conduct paired (inside-outside) monitoring of priority MPAs at the sampling frequency and scope identified for the target ecosystem or human use category (i.e., consumptive or non-consumptive)

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- 2) *Scientific/technical merit*: Assessment of the conceptual framing and technical approaches proposed to achieve project goals
- 3) *Partnerships, collaborations, and local expertise*: Assessment of whether the proposal takes best advantage of the knowledge and capacity existing within [INSERT RELEVANT REGION(S) OR STATEWIDE], including broad partnerships (e.g., tribes, citizen scientists, fishermen) and multiple forms of science (e.g., traditional ecological knowledge, local knowledge)
- 4) *Project costs and funding leverage*: Assessment of cost-effectiveness, including project cost relative to Monitoring Program objectives (see above), and ability to leverage other available funds to conduct the project, to reach a minimum of [XX]% matching funds
- 5) *Qualifications of project lead(s) and demonstrated access to facilities and resources*  
Assessment of whether the applicants possess the necessary knowledge, experience, training, facilities and resources to complete the project
- 6) *Project management experience, expertise, and skills*: Assessment of multiple facets of project management, including a proven track record in completing contracts on-time and within budget, experience managing and working in multi-party, multidisciplinary teams, and communication skills. Communication skills include the ability to provide clear and effective communication of project goals, approaches and results to diverse audiences interested in monitoring information.

When considered together, these criteria will provide the basis for evaluating the overall value of each submission with the aim of securing the most advantageous arrangement to meet the program objectives. Selection of the preferred Consultant(s) is expected to be a two-step process in which short-listed applicants will be contacted for follow-up telephone and/or in-person meetings. Should more than one applicant advance beyond step one, these short-listed applicants may be requested to make brief presentations in support of their applications. We expect that Consultant(s) will be selected by [DATE].

## Contact

Questions may be directed to [NAME], [TITLE], [ORGANIZATION], at [EMAIL] or [PHONE].

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## Template: Request for Proposals (RFP)

### Section 1: Summary

**Instructions:** This section will provide a high-level summary of the objectives, scope, and submission deadline.

**Sample Language:** [STATEMENT ABOUT HOW THIS RFP AND OTHER GUIDING DOCUMENTS (e.g., workplan) WAS DEVELOPED] [HIGH-LEVEL STATEMENT ABOUT FUNDING SOURCE]

Proposals are requested that address two main objectives:

1. To assess the condition of [INSERT ECOSYSTEM OR HUMAN USE CATEGORY (I.E., CONSUMPTIVE OR NON-CONSUMPTIVE) HERE] inside and outside MPAs
2. To assess the trend in condition of [INSERT ECOSYSTEM OR HUMAN USE CATEGORY (I.E., CONSUMPTIVE OR NON-CONSUMPTIVE) HERE] using newly collected data together with data from the baseline monitoring program and other existing data, where available.

All proposals will be evaluated against the criteria listed in Section X, including alignment with objectives, scientific and technical merit, demonstration of partnerships, incorporation of local expertise, costs, funding leveraging, and qualifications of project leads. [INSERT 2-4 SENTENCES THAT DESCRIBE THE EVALUATION AND SELECTION PROCESS SPECIFIC TO THIS ANNOUNCEMENT] Final decisions will be made jointly by staff of [AGENCIES/ORGANIZATIONS].

Questions related to proposal requirements should be directed to [AGENCY/ORGANIZATION] (see Section X for guidance and contact information). Answers to frequently asked questions and any updates relating to this RFP will be available on the [AGENCY/ORGANIZATION] website ([ENTER WEBSITE HERE]). Persons intending to submit proposals in response to this RFP should consult this website frequently for updates and additional information. The deadline for receipt of submissions is [TIME] PST on [DATE].

### Section 2: Background

**Instructions:** This section will include a description of the organization issuing the RFP, brief overview of the policy guidance (e.g., MLPA, MLPA Master Plan, Partnership Plan), introduction to the other documents (e.g., workplan, monitoring plan), and where to find additional background information.

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### Section 2: Objectives

**Instructions:** This section will describe the objectives specific to the ecosystem or human use category (i.e., consumptive or non-consumptive) being targeted with the RFP.

**Sample Language:** The projects described herein have [#] objectives:

1. Assess the condition of *[INSERT ECOSYSTEM OR HUMAN USE CATEGORY (I.E., CONSUMPTIVE OR NON-CONSUMPTIVE) HERE]* inside and outside MPAs in the *[INSERT TARGET REGION(S) OR STATEWIDE]*. Activities must focus on the sites identified in the Scope (see Section X) and metrics identified in the Statewide MPA Monitoring Action Plan.
2. Assess the trend in condition of *[INSERT ECOSYSTEM OR HUMAN USE CATEGORY (I.E., CONSUMPTIVE OR NON-CONSUMPTIVE) HERE]* inside and outside MPAs in the *[INSERT TARGET REGION(S) OR STATEWIDE]*. This should include using newly collected data together with data from the baseline monitoring program and other existing data, where available.

*[INSERT ADDITIONAL OBJECTIVE(s) HERE, AS IDENTIFIED]*

### Section 4: Scope

**Instructions:** This section will describe the geographic (list of recommended sites), temporal, and scientific scope for proposals.

### Section 5: Guidance and Deliverables

**Instructions:** This section will describe the programmatic guidelines (e.g., focus on objectives, importance of a partnership-based approach) and expected deliverables (e.g., data and metadata, progress reports, final report).

### Section 6: Application and Submission Information

**Instructions:** This section will include requirements and guidelines for developing and submitting application packages, including proposal components (e.g., cover letter, narrative, budget with match/leveraging) and other required documents (e.g., curriculum vitae, letters of support).

### Section 7: Proposal Review

**Sample Language:** *[AGENCY/ORGANIZATION]* will evaluate submissions against the following criteria:

- 1) *Relevance and applicability to the objectives of the Statewide MPA Monitoring Program:* Assessment of alignment of project goals with the Monitoring Program objectives, including:
  - Efficiencies in data collection to address multiple program priorities

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- Ability to conduct paired (inside-outside) monitoring of priority MPAs at the sampling frequency and scope identified for the target ecosystem or human use category (i.e., consumptive or non-consumptive)
- 2) *Scientific/technical merit*: Assessment of the conceptual framing and technical approaches proposed to achieve project goals
  - 3) *Partnerships, collaborations, and local expertise*: Assessment of whether the proposal takes best advantage of the knowledge and capacity existing within the [INSERT TARGET REGION(S) OR STATEWIDE], including broad partnerships (e.g., tribes, citizen scientists, fishermen) and multiple forms of science (e.g., Indigenous traditional knowledge, fishermen’s knowledge, local knowledge)
  - 4) *Project costs and funding leverage*: Assessment of cost-effectiveness, including project cost relative to Monitoring Program objectives (see above), and assessment of ability to leverage other available funds to conduct the project, to reach a minimum of [XX]% matching funds
  - 5) *Qualifications of project lead(s) and demonstrated access to facilities and resources*: Assessment of whether the applicants possess the necessary knowledge, experience, training, facilities and resources to complete the project
  - 6) *Project management experience, expertise, and skills*: Assessment of multiple facets of project management, including a proven track record in completing contracts on-time and within budget, experience managing and working in multi-party, multidisciplinary teams, and communication skills. Communication skills include the ability to provide clear and effective communication of project goals, approaches and results to diverse audiences interested in monitoring information.

[ADDITIONAL SELECTION CRITERIA: Additional selection criteria should be added that are specific to the announcement described in the RFP.]

When considered together, these criteria will provide the basis for evaluating the overall value of each submission with the aim of securing the most advantageous arrangement to meet the program objectives. Selection of the preferred Consultant(s) is expected to be a two-step process in which short-listed applicants will be contacted for follow-up telephone and/or in-person meetings. Should more than one applicant advance beyond step one, these short-listed applicants may be requested to make brief presentations in support of their applications. We expect that Consultant(s) will be selected by [DATE].

## Section 8: Selection Process

**Instructions:** This section will include a description of the review & selection process, which may vary based on the specifics of the announcement described.

## Contacts

Questions may be directed to [NAME], [TITLE], [ORGANIZATION], at [EMAIL] or [PHONE].

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## Appendix B. Expressions of Interest: Overview and Process Design

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### Background

As the regional baselines near completion, California is designing and implementing Phase 2 of the Statewide MPA Monitoring Program -- long-term, statewide monitoring. Phase 2, reflects current State priorities and management needs, while building on the knowledge, capacity, and unique considerations for each region. With an efficient, leveraged, long-term monitoring program, California is delivering on data and information that support near-term and long-term decisions.

Strategic investments in research and development and long-term monitoring can advance us toward programmatic objectives, from addressing short- and long-term evaluation questions to advancing technology and fundamental research to improve MPA monitoring approaches. To advance the efficacy and efficiency of the MPA Monitoring Program, a transparent and competitive process is needed to select contractors for future work in these areas.

Expressions of Interest (EOI) are one of the ways in which companies, NGOs, foundations, and governmental organizations can begin the grant or contracting process. It is one of several options for proposal processes from which either all or just one can be done, depending upon the needs of the funder (See Table 1). EOIs are often done earlier in the granting process, than, for example, a Request for Qualifications, especially when either the institutions interested or the types of solutions or research needed to address the scientific or industry problem are largely unknown.

California intends to use an EOI for the following purposes:

- To create a short list of vendors from which to solicit full proposals later in a process/ get applicants interested in applying with a full proposal later in the process.
- To solicit for research and monitoring in support of the program for which matching funds are already in hand from other sources (e.g. NOAA, NSF, SeaGrant, State General Funds).

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*Table 1: A short description of the different types of proposal solicitations and associated terminology.*

Type of process (in order of specificity)	Purpose/Outcome
Request (or Registration) for information (RFI)	<ul style="list-style-type: none"> <li>Determining stakeholder and client interest and needs</li> <li>Supplier pre-qualification process (get on list to submit EOIs or proposals later)</li> </ul>
Expression of Interest (EOI)	<ul style="list-style-type: none"> <li>Determine interest of researchers, consultants, NGOs, etc.</li> <li>Help scope final RFP/RFO/RFQ</li> </ul>
Request for Proposals/Request for Offer (RFP/RFO)	<ul style="list-style-type: none"> <li>Open ended solicitation of proposals where innovative solutions or flexible solutions are preferred</li> </ul>
Request for Qualifications or Quotation (RFQ)	<ul style="list-style-type: none"> <li>Clearly defined needs and approach provided by funder</li> </ul>

## Developing the EOI Announcement

The first step in developing the EOI announcement should be to identify the priority questions/topics prior to each release. The team should work together to decide upon a timeline, process, key partners, and level of detail for developing this information.

Once the priority questions are developed the team can then create the EOI announcement itself. EOIs can contain a wide array of information provided by the funder about the opportunity, including details about information requested from the applicant. We have provided an initial list of both of these for the group to consider when crafting the EOI announcement. The end of this document contains links to example EOI announcements. The goal length for the entire EOI announcement should be 2-4 pages.

Other example EOI announcements include some of the following information by the funder:

- Clearly define the opportunity and/or project
- Provide a solid process plan with timelines
- Clearly stated priorities
- Include a general outline of the evaluation criteria for the subsequent proposal submission, evaluation, and selection process
- Address potential questions (e.g., FAQs such as who is eligible to apply)
- Submission length and required content
- Invite those who are interested to respond
- Amount range; year range up for grabs



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Applicants are often asked to provide the following information in their EOI:

- Team/partners and key personnel
- Relevant experience, submitted as a resume or curriculum vitae (*often an evaluation criterion*)
- Approach to the project (1-2 paragraphs)
- Scientific merit (*often an evaluation criterion*)
- How the proposal is in alignment with the funder stated priorities (*often an evaluation criterion*)
- Any current, pending, or potential matching funds (*submitted as an attachment with all funds listed with grantor, title, award amount, etc.*)
- Details about matching funds, in kind support, etc. (*often an evaluation criterion*)
- Relevant supporting documents (e.g., funded research proposal(s) for matching funds, resume/curriculum vitae, letters of support from project partners, etc.)

### Solicitation, Evaluation, & Selection Processes

EOI announcements should have a relatively clearly delineated process for soliciting, evaluating, and selecting applicants from whom to solicit full proposals. Likewise, the proposals received should also have a clearly delineated evaluation and selection process.

Questions and examples for consideration are provided below for each of three process steps:

#### Solicitation

Questions and issues to address include:

- How will the solicitation be publicized and through what channels
  - OceanSpaces blog & newsletter
  - CDFW blog
  - OPC listserv
  - Ocean Science Trust newsletter
  - Collaborative Network newsletter
  - OPC-SAT: request members send it through their home institution channels
  - Tribes: consider sending out letters, presenting at a Fish and Game Commission Tribal Committee Meeting, regional Tribal Chairmen's Association Meetings, and other formal bodies
  - MPA Statewide Leadership Team: request members send it through their agency/organization channels
  - FGC Marine Resources Committee: consider presenting at a Committee meeting

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- Secretary Laird's twitter feed
- FGC: consider requesting Craig Shuman include this in his Marine Region update or make an announcement during the public comment period at relevant/upcoming FGC Meeting (if timing works out)
- How will we ensure to reach and appeal to the right depth and breadth of teams to apply?
  - Distribution to the above list
  - Appeal: Invite academic creativity and innovation in the project described in the EOI.
  - Breadth: Evaluation criteria and expression of prioritization emphasize partnerships, interdisciplinary approaches (if applicable), etc.
- How often is the EOI announcement released? (e.g., rolling/always open? open period once per year or twice per year? if not rolling/always open, what time of year?)
  - Funding cycle may govern this – open period once a year may make sense, from a funding perspective
  - Timing of the first release -- need to consider R&D needs in upcoming funding cycle (FY17.18), and future data collection needs in FY18.19 funding cycle

### *Evaluation*

Evaluation criteria vary depending on the funder, type of grant, and monetary amount. Evaluation criteria can be very project specific. Evaluation criteria can also be made to be very general. The team should work together to determine which level of criteria or combination thereof makes the most sense for this particular EOI process (and proposals), considering Monitoring Program goals to decide priority evaluation criteria. Example evaluation criteria are provided below:

- Relevance and applicability to priorities of the Monitoring Program: Assessment of alignment of project goals with the Monitoring Program purposes and priorities
- Scientific/technical merit: The degree to which the proposed project is innovative and will advance the state of the science or discipline through rigorous, state-of-the-art research.
- Users, participants and partnerships: The degree to which users or potential users of the results of the proposed project have been brought into the planning of the project, will be brought into the execution of the project, and will use results. Researchers must work with end-users to develop relevant proposals. Demonstrated knowledge, partnerships, relationships, collaborations or other mechanisms for bringing users and partners into the project.
- Project costs and funding leverage: Description of funds already secured or under development for the proposed project. Demonstrated efficiencies in data collection, partnerships, etc.
- Qualifications of project lead(s) and demonstrated access to facilities and resources: Assessment of whether the applicants possess the necessary knowledge, experience, training, facilities and resources to complete the project

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- Project management experience, expertise, and skills: Assessment of project management, including a proven track record in completing contracts on-time and within budget, experience managing and working in multi-party, multidisciplinary teams. Demonstrated list of grants, bringing projects to completion, delivering on contracts and grants, etc.
- Communication/Outreach component: Include the ability to provide clear and effective communication of project goals, approaches, and results to diverse audiences interested in monitoring information. Ability to create text, figures, documents for a variety of audiences outside of academia. Demonstrated established channels or partnerships on project team for outreach efforts.
- Timeliness/Urgency of the research: Due to changing ocean conditions as a result of both human and natural causes, priority given to research addressing issues needing immediate attention can arise and are not amenable to waiting until the next funding cycle.
- Proof of concept/Preliminary data (if applicable): Does the proposal have proof of concept through a previously funded or currently funded pilot project? Does it already have preliminary data in hand to hone a research proposal or leverage existing data?

Evaluation criteria, once selected, need to be weighted for their importance for use in the final scoring process (i.e., scientific/technical merit is 20% of the score, while partnerships is 30%).

### **Selection**

Selecting EOIs to continue on to a full proposal submission often takes the form of peer review for many granting authorities (e.g., Sea Grant, NIH, NSF). Sometimes a peer review panel or committee is selected by the funder and either meets in-person to score and make selections, or reviews and scores independently, submitting their reviews to the funder, who makes a final funding decision. In other cases, the selection process has multiple steps, including independent reviews, followed by an in-person review panel. Examples are provided below:

- National Science Foundation (detailed and clearly delineated approach to their review methodologies): [http://www.nsf.gov/bfa/dias/policy/merit\\_review/](http://www.nsf.gov/bfa/dias/policy/merit_review/)
- California Sea Grant: <https://caseagrant.ucsd.edu/grants-and-funding/call-for-full-proposals>

The project team should decide upon an EOI selection process that takes into consideration:

- How to nominate and select peer reviewers, such as –
  - Who should select the review team?
  - Is there a role for the OPC-SAT?
  - Is there a role for the MPA Statewide Leadership Team?
  - What should the composition of reviewers be? (e.g. one CDFW, One OPC, academic, NOAA, etc.)

Memorandum: Fund Disbursement Mechanisms  
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- Does the team remain the same or change from year-to-year or from EOIs to full proposals?
- Are reviewers compensated for their time?
- How to score the EOIs under review: There are many different options – .
  - Average of scored reviews (reviewers score independently): if there is a wide range of scores then this method may not be viable
  - Consensus, following independent reviews and in-person discussion
  - Lead reviewer considers all independent reviews and makes final decision
- What sort of transparency should there be in terms of sharing reviews and providing feedback to teams who submitted EOIs or full proposals?
- How will the reviews be conducted?
  - Independent (“mail-in”) review
  - Conference call with review panel/committee
  - In-person workshop
  - Combination of the above
- Is the same review process used for EOIs as for full proposals? Or are different approaches used?

### Selected example EOIs

- **Schmidt Ocean Institute:** <http://schmidtoccean.org/apply/expression-of-interest/>  
 Partial list of example evaluation criteria from the Schmidt Ocean Institute (full list here: <http://schmidtoccean.org/apply/expression-of-interest/>) –
  - Opportunities for the advancement of ocean research technologies, practices, and method: Do the project objectives include R&D, prototyping, or testing of new oceanographic technologies, practices, or methods? How significant are the implications of the proposed technology/methodology R&D for ocean sciences? How clearly is the proposed R&D approach articulated? How well does the proposed R&D approach address the key pertinent project challenges?
  - Evidence of significant intrinsic intellectual merit and impact potential: How important is the proposed research for ocean sciences? How significant are the implications of the proposed research for the society? What is the quality of the proposed research plan? How comprehensively does the proposed research plan address the stated project objectives?
- **Florida Sea Grant:** [https://www.flseagrant.org/funding/open/biennial\\_call\\_for\\_proposals/](https://www.flseagrant.org/funding/open/biennial_call_for_proposals/)

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Example evaluation criteria from Florida Sea Grant EOI announcement –

Scientific Merit: The degree to which the proposed project is innovative and will advance the state of the science or discipline through rigorous state-of-the-art research.

Users, Participants and Partnerships: The degree to which users or potential users of the results of the proposed project have been brought into the planning of the project, will be brought into the execution of the project, and will use results. Researchers must work with end-users to develop relevant proposals.

Expected Results, Applications and Benefits: The degree to which the completed project is expected to create new commercial opportunities, improve technological and economic efficiency, promote environmental sustainability, or improve management decisions, in Florida or possibly nationally.

- ***European Science Foundation:***

[http://www.esf.org/index.php?eID=tx\\_nawsecuredl&u=0&g=0&t=1471543933&hash=1623a13d905e0f82eac3f0e525d1ac3395b86256&file=fileadmin/be\\_user/activities/Career\\_Tracking/CT\\_CALL\\_TEXT\\_final.pdf](http://www.esf.org/index.php?eID=tx_nawsecuredl&u=0&g=0&t=1471543933&hash=1623a13d905e0f82eac3f0e525d1ac3395b86256&file=fileadmin/be_user/activities/Career_Tracking/CT_CALL_TEXT_final.pdf)

Appendix B:

**PERFORMANCE  
EVALUATION  
QUESTIONS  
AND METRICS**

**TABLE B1:** Performance objectives, questions, and metrics for network evaluation at meeting the goals of the Marine Life Protection Act (MLPA).

<b>MLPA GOAL 1:</b> <b>PROTECT THE NATURAL DIVERSITY AND ABUNDANCE OF MARINE LIFE,  AND THE STRUCTURE, FUNCTION, AND INTEGRITY OF MARINE ECOSYSTEMS</b>		
PERFORMANCE OBJECTIVE	MEASURABLE QUESTION	LONG-TERM MONITORING INDICATOR
<b>Protect areas of high species diversity and maintain species diversity and abundance, consistent with natural fluctuations of populations in representative habitats</b>	Do focal and/or protected species inside of MPAs differ in size, numbers, and biomass relative to reference sites?	Size/age structure of focal species, abundance, and biomass measures
	Does functional diversity differ in MPAs relative to reference sites?	Functional diversity metrics
	Do MPAs that include multiple habitat types harbor higher species abundance or more diverse communities than those that encompass a single habitat type or less diverse habitat types?	Size/age structure, abundance, and biomass of focal species, community diversity measures in MPAs with high habitat diversity and low habitat diversity
<b>Protect natural trophic structure and food webs in representative habitats</b>	Do the abundance, size/age structure, and/or diversity of predator and prey species differ inside MPAs, or outside areas of comparable habitat?	Trophic structure metrics
<b>Protect ecosystem structure, function, integrity, and ecological processes to facilitate the recovery of communities from both natural and human disturbances</b>	Does the nature or timing of recovery of natural communities from disturbance events differ in different types of MPAs relative to outside areas?	Ecosystem structure and function metrics and their diversity



## MLPA GOAL 2:

HELP SUSTAIN, CONSERVE, AND PROTECT MARINE LIFE POPULATIONS,  
INCLUDING THOSE OF ECONOMIC VALUE, AND REBUILD THOSE THAT ARE DEPLETED

PERFORMANCE OBJECTIVE	MEASURABLE QUESTION	LONG-TERM MONITORING INDICATOR
Protect, sustain, and conserve regional populations of selected harvested or non-harvested species and the habitats on which they depend	How does spatial variability in fishing effort and fishing mortality rates prior to and after MPA implementation affect the abundance and/or size/age structure of harvested species in MPAs?	Logbook data, California Recreational Fisheries Survey (CRFS) data, local fishing mortality rates, size/age structure of focal species, abundance and biomass measures
	How do species differ in their rate of response to MPA implementation?	Population models, size/age structure of focal species, abundance and biomass measures
	What is the relationship between MPAs and the displacement, compaction, and concentration of nearshore fishing efforts? Did overall fishing effort/mortality rates and yield change since MPA implementation?	Fishing effort and catch data, local fishing mortality rates, catch-per-unit-effort
	Do differences in fishing distribution, magnitude, and mortality rates prior to MPA implementation affect changes in the abundance and/or size/age structure of populations of focal species within MPAs relative to reference sites over time?	Fishing effort and catch data, local fishing mortality rates, size/age structure of focal species, abundance, and biomass measures
	What is the rate and distribution of adult spillover of targeted fishery species from MPAs into adjacent areas?	Tagging studies, density patterns relative to distance across MPA boundaries
	Is the implementation of MPAs as a habitat-based approach to marine fisheries management more or less effective in maintaining sustainable fisheries than traditional management strategies such as limiting harvest in a non-spatially explicit manner?	Logbook data, CRFS data, local fishing mortality rates, stock assessments
	What are the economic effects of MPA placement; specifically distance from ports and location relative to fishing grounds?	Fishing effort and catch data, local fishing mortality rates, catch-per-unit effort, distance from port to fishing grounds
	What is the value of the ecosystem services provided by California's MPAs?	Examples include measures of the role MPAs play in climate change resilience, recreation and tourism, cultural uses, science and educational uses, and conservation of economically important fisheries

**MLPA GOAL 3:**

TO IMPROVE RECREATIONAL, EDUCATIONAL, AND STUDY OPPORTUNITIES PROVIDED BY MARINE ECOSYSTEMS THAT ARE SUBJECT TO MINIMAL HUMAN DISTURBANCES, AND TO MANAGE THESE USES IN A MANNER CONSISTENT WITH PROTECTING BIODIVERSITY

PERFORMANCE OBJECTIVE	MEASURABLE QUESTION	LONG-TERM MONITORING INDICATOR
<b>Ensure MPAs are accessible for recreational, educational, and study opportunities</b>	Are researchers accessing MPAs, and has research increased over time in MPAs?	Trends in number of research studies conducted in MPAs over time; dissemination of results of research studies within MPAs
	Has the magnitude and variety of recreational/educational use increased over time in MPAs?	Visitor use surveys
	How has non-consumptive use and enjoyment of marine ecosystems changed since MPA implementation? Has the public's perceived value or desire to visit the areas where the MPAs have been implemented changed due to their presence?	Contingent valuation studies (willingness to pay for access to MPAs)
	Are recreational consumptive users able to mitigate short-term costs of displacement from MPAs by conducting activities along the edge of MPAs? Will there be long-term benefits from the edge effect?	Changes in use patterns and catch of targeted species by consumptive users over time
	How are knowledge, attitudes, and perceptions regarding the MPAs changing over time?	Public and user group knowledge, attitudes, and perceptions of MPAs
<b>Protect or enhance recreational experience by ensuring natural size and age structure of marine populations</b>	Are non-consumptive recreational experiences in areas subject to reduced fishing improving? What are the attitudes and perceptions of users and their recreational experience and how has that changed over time?	Predicted increase in user group satisfaction based on user group surveys
	Is the size/age structure of recreationally valued species increasing in MPAs over time?	Differential size/age structure of selected species inside and outside MPAs over time; onboard and dockside sampling of recreational catch, location and effort

**MLPA GOAL 4:**

**PROTECT MARINE NATURAL HERITAGE, INCLUDING PROTECTION OF REPRESENTATIVE AND UNIQUE MARINE LIFE HABITATS IN CALIFORNIA WATERS FOR THEIR INTRINSIC VALUE**

PERFORMANCE OBJECTIVE	MEASURABLE QUESTION	LONG-TERM MONITORING INDICATOR
<b>Protect representatives of all marine habitats identified in the MLPA across a range of depths</b>	Have unique habitats been adequately represented and protected by the current distribution and designation of MPAs?	Habitat mapping within MPAs to groundtruth what is captured in MPAs
	Does the abundance or quality of habitat (geologic, oceanographic, biogenic) increase or remain the same within an MPA?	Habitat metrics (e.g., derived from seafloor maps, water quality, and species that form biogenic habitat)
<b>Protect marine natural heritage</b>	Have endangered species and/or culturally significant species benefited from the presence of California's MPAs?	Population trends of special status species (Section 2.3, Indicator Species Selection)
	Do MPAs limit the spread of invasive species?	Comparison of the presence and abundance of invasive species inside and outside of MPAs (Refer to list of current invasive species in California) <sup>1</sup>

<sup>1</sup> <https://www.wildlife.ca.gov/Conservation/Invasives>

**MLPA GOAL 5:**

**ENSURE CALIFORNIA'S MPAS HAVE CLEARLY DEFINED OBJECTIVES,  
EFFECTIVE MANAGEMENT MEASURES, AND ADEQUATE ENFORCEMENT, AND  
ARE BASED ON SOUND SCIENTIFIC GUIDELINES**

PERFORMANCE OBJECTIVE	MEASURABLE QUESTION	LONG-TERM MONITORING INDICATOR
For the MPA Network, develop objectives and a long-term monitoring plan that includes a strategy for MPA evaluation	Are efforts to collect long-term monitoring data coordinated sufficiently such that cohesive conclusions can be formed about MPA Network performance?	Results from funded long-term monitoring studies
	Does the MPA Monitoring Action Plan produce sufficient information that enables the evaluation of Network performance and informs adaptive management?	Peer review of the MPA Monitoring Action Plan; cost-efficient spending and funding
Ensure adequate enforcement and compliance with MPA regulations	Is monitoring of human activity and enforcement adequate for preventing illegal take in MPAs?	Trends in number of citations/enforcement actions for violations of MPA regulations
	Do penalties for non-compliance deter users from violating regulations?	Trends in number of citations/enforcement actions for violations of MPA regulations
	How has the level of compliance changed over time since the MPAs were first implemented and what factors influence variation in compliance within and among MPAs?	Trends in number of citations/enforcement actions for violations of MPA regulations as a function of MPA features (e.g., size, location, level of protection, enforcement), socioeconomic factors, and human uses in proximity to MPAs
	Does locating a boat ramp or other access point affect the level of enforcement and compliance with MPA regulations?	Trends and spatial distribution of number of citations/enforcement actions for violations of MPA regulations
	Are there incentives that can help reduce noncompliant behavior inside MPAs?	Evaluate if incentive programs exist for ensuring compliance with MPA regulations
	Do State Marine Reserve (SMR)/State Marine Conservation Area (SMCA) clusters provide greater protection than stand-alone SMRs?	Size/age structure of focal species, abundance and biomass measures; evaluate clusters in comparison to stand-alone MPAs as part of Network evaluation
	Does the level of compliance differ between SMRs and SMCAs?	Trends and spatial distribution of number of citations/enforcement actions for violations of MPA regulations

**MLPA GOAL 6:**

**ENSURE THAT THE STATE'S MPAS ARE DESIGNED AND MANAGED,  
TO THE EXTENT POSSIBLE, AS A NETWORK**

PERFORMANCE OBJECTIVE	MEASURABLE QUESTION	LONG-TERM MONITORING INDICATOR
<b>Evaluate network functionality and MPA sizing and spacing guidelines that were implemented under the MLPA</b>	What are the demographic effects of siting MPAs in larval source or sink locations, and how do demographic responses to MPAs contribute to larval production and connectivity of MPAs in the network?	Demographic-connectivity model for determining linkages of MPAs in the network and their effects on population; evaluation of demographic-connectivity projections with size/age structure of focal species, abundance and biomass data collected through long-term monitoring
	How does the distance and larval contribution between a source MPA and sink MPA influence the ecosystem response inside the sink MPA?	Evaluation of demographic-connectivity model with size/age structure of focal species, abundance and biomass data collected through long-term monitoring
	How does the level of connectivity and larval supply from an MPA to areas outside of MPAs affect fisheries?	Demographic-connectivity model projections of larval supply from MPAs to areas outside MPAs
	Are MPAs with higher connectivity more resilient to sudden environmental disturbance as compared to more isolated MPAs with higher self-retention?	Size/age structure of focal species, abundance and biomass data, evaluation dependent on stressor
	How do other stressors impact the management of MPAs over time (e.g., water quality, oil spills, desalination plants, ocean acidification, sea level rise)?	Size/age structure of focal species, abundance and biomass data, evaluation dependent on stressor
	Do MPAs with higher connectivity have lower variability in population trends compared to more isolated MPAs?	Evaluation of demographic-connectivity model with size/age structure of focal species, abundance and biomass data collected through long-term monitoring

Appendix C:

**CALIFORNIA  
ESTUARY AND  
WETLAND  
MONITORING  
SURVEY**

**Estuarine & Wetland Ecosystems: the first steps in developing an approach to leveraging  
existing monitoring programs**

**Brent B. Hughes**

**UC Santa Cruz**

***A report prepared for California Ocean Science Trust***

**June 2017**



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## About this Document

The goal of this document is to characterize existing and emerging capacity and resources for monitoring conditions and trends of estuarine and wetland ecosystems (including both ecological and physical metrics), inside and outside of California MPAs. This project was completed in coordination with the author, California Ocean Science Trust, California Ocean Protection Council, and the California Department of Fish and Wildlife. We thank the following people for helpful comments and discussion during the preparation of this report: Mark Carr, David Gill, Frank Shaughnessy, Jeff Crooks, and all of the other scientists and managers who provided useful information.

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**Definitions and acronyms used in this report:**

CAERS: California Estuarine Research Society  
 CDFW: California Department of Fish and Wildlife  
 CEDEN: California Environmental Exchange Network  
 CMECS: Coastal and Marine Ecological Classification Standard  
 DO: Dissolved oxygen  
 MLPA: Marine Life Protection Act  
 MPA: Marine Protected Area  
 NERR: National Estuarine Research Reserve  
 NEP: National Estuary Program  
 NPS: National Park Service  
 NT: No-Take Reserve  
 OPC: Ocean Protection Council  
 OST: Ocean Science Trust  
 PISCO: Partnership for Interdisciplinary Studies of Coastal Oceans  
 PMEP: Pacific Marine and Estuarine Fish Habitat Partnership  
 SCP: Scientific Collection Permit  
 SMCA: State Marine Conservation Area  
 SMR: State Marine Reserve  
 SMRMA: State Marine Recreational Management Area  
 SONGS: San Onofre Nuclear Generating Station Mitigation Monitoring Program  
 SWQCB: State Water Quality Control Board  
 TNC: The Nature Conservancy

## Summary

A key first step in evaluating the performance goals of Marine Protected Areas (MPA) is establishing baseline-monitoring programs. The establishment of California Marine Life Protection Act (MLPA) established 23 estuarine MPAs. These MPAs were subdivided into 5 regions, each with its own target metrics to evaluate their performance in meeting MPA goals. The purpose of this report was to determine the existing monitoring programs in California estuaries that could provide leverage to monitoring as outlined in the MLPA. To do this we aimed to develop a comprehensive list of monitoring programs within the 23 estuarine MPAs, identify estuaries outside of the MPA network that would serve as good reference sites, and determine the important gaps that exist for estuarine monitoring within the MLPA framework. Working with partners from UC Santa Cruz, the California Ocean Science Trust (OST), the Ocean Protection Council (OPC), and California Department of Fish and Wildlife (CDFW), we developed a database of existing long-term (committed to greater than 4 years of monitoring) for target metrics in estuaries across the state. Together we identified 176 monitoring projects for the various target metrics across California estuaries. Despite this seemingly high number of monitoring programs most were limited to certain estuaries (e.g., Elkhorn Slough and Humboldt Bay) or programs (e.g., National Estuarine Research Reserve or San Onofre Nuclear Generating Station Mitigation Monitoring Program) or were limited to certain metrics (Dissolved Oxygen, pH, and eelgrass). We identified where many of the existing monitoring gaps occurred and discussed how future efforts could fill these gaps. These strategies include: establishing a network of researchers across the state to coordinate monitoring efforts, establishing other target monitoring metrics that could readily support MLPA goals, and using a regional conference to establish a network of researchers to take on monitoring of target metrics.

## Introduction

### *Leveraging ecological monitoring to support the CA MPA program*

Marine protected areas (MPAs) are a modern solution to managing and conserving ocean resources. Recent advances in theory on MPA design have determined that traditional MPAs, usually developed on small site-specific scales, can have little effect to maintaining the diversity and abundance of ocean resources over larger regional scales (Gaines et al. 2010). Since many anthropogenic disturbances and threats (e.g., climate change and over-fishing) to marine ecosystems occur over larger scales there is a high demand for developing networks of MPAs that can aid in mitigating harmful stressors.

An essential feature of determining the effectiveness of MPAs is the development of monitoring protocols that document conditions before and after implementation, and inside and outside of MPAs to monitor changes in target populations (e.g., fishery species), species assemblages, environmental conditions, and other factors necessary for impact evaluation (Ahmadia et al. 2015, Gill et al. 2017). In California, the 1999 Marine Life Protection Act (MLPA) called for the redesign of existing MPAs and the establishment of a statewide network. The MLPA also requires monitoring inside and outside of this network to assess conditions and evaluate MPA performance.

One of the eight coastal and nearshore ecosystems in California MPAs is estuaries. The establishment of the MPA network and the MLPA's monitoring requirement, created the need for monitoring inside and outside 20 estuaries that fall within MPAs across four regions: North Coast, North Central Coast, Central Coast, and South Coast (Figure 1). There are pre-existing monitoring programs within individual estuaries or across multiple that could help to achieve this task, such as those led by: state agencies (e.g., California Department of Fish and Wildlife - CDFW, State Water Quality Control Board - SWQCB), federal agencies (e.g., National Estuarine Research Reserve - NERR, National Estuary Program - NEP, National Park Service NPS), academic institutions, non-profit organizations, and citizen science programs (e.g., Elkhorn Slough Volunteer Water Quality Monitoring Program<sup>1</sup>, Sea Otter Savvy<sup>2</sup>, and Bay Net<sup>3</sup>). However, a grand challenge is determining whether or not these programs are collecting data and information at spatial, temporal, and taxonomic scales that are relevant to evaluating MPA performance, and more specifically, whether the metrics being monitored by existing programs align with those identified as top priorities for MPA monitoring.

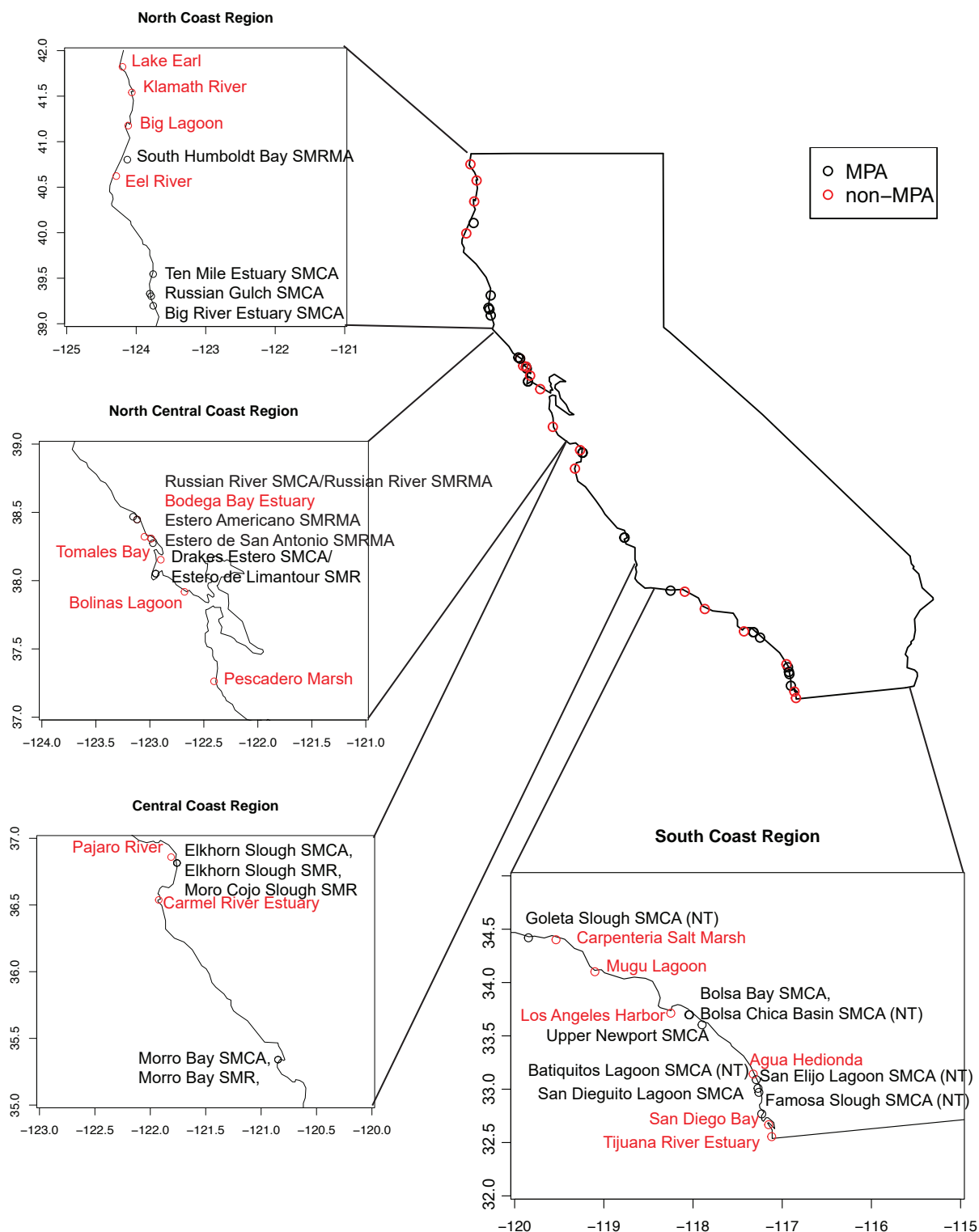
The objectives of this project were to: 1) identify estuarine and wetland MPA and reference sites across the state of California, 2) identify the existing programs and program managers, 3) identify the metrics being sampled by each program, 4) determine if these programs are planning to be long-term (>4 years), so as to inform the effectiveness of established MPAs.

For this project we (Brent Hughes in collaboration with the Ocean Science Trust (OST), California Ocean Protection Council (COPC), and CDFW) aimed at bridging the gap between researchers who are engaged in long-term monitoring and the science needs of the MPA Monitoring Program, by doing the following: 1) develop a database that catalogues estuarine and wetland monitoring programs in California, including documentation of biological and water quality metrics, data management, accessibility to existing information, and program/project duration (MLPA-Partnership 2016, Hughes et al. 2017), and 2) document common metrics among existing estuarine monitoring programs and MPA monitoring metrics for estuaries and wetland ecosystems, as identified in the regional MPA Monitoring Plans.

<sup>1</sup>[http://www.elkhornslough.org/research/waterquality\\_volunteer.htm](http://www.elkhornslough.org/research/waterquality_volunteer.htm)

<sup>2</sup><http://www.seaottersavvy.org/volunteer>

<sup>3</sup><http://montereybay.noaa.gov/getinvolved/volunteer/baynet.html>



**Figure 1.** Distribution of estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California. The MLPA defined a fifth region in California, San Francisco Bay, but to-date the MLPA MPA siting process has not begun in that region. NT = No-Take MPA.

## Methods

### *Identification of MPA and reference sites: a crosswalk with previous efforts*

We started with a preliminary list of 23 potential estuarine MPAs provided by OST and CDFW. Not all of these MPAs turned out to be estuaries, mainly because, while the name implies estuary, the MPA is actually offshore (e.g., Tijuana River Mouth State Marine Conservation Area - SMCA). We aimed to identify a proportional number of “control” estuaries to compare with MPAs across all four coastal regions. A recent study done by The Nature Conservancy (TNC) and Pacific Marine and Estuarine Fish Habitat Partnership (PMEP) identified 184 estuaries in California that range in size from <1 ha to >10,000 ha (i.e., San Francisco Bay) (Hughes et al. 2014). This database encompassed all estuarine MPAs in California and served as a baseline to identify:

- Estuaries that have known fish and invertebrate monitoring.
- Potential non-MPA (control) estuaries based on the following attributes:
  - Regional representation (among the 4 MPA regions)
  - Estuary type, i.e., lagoon, riverine, bar built, etc.
  - Estuary acreage to ensure that MPAs and control sites are of comparable size.
  - Existing monitoring programs as outlined by the regional MPA monitoring target metrics.

After MPA sites and candidate reference sites were determined (Appendix 1, Table 1), we gathered all target monitoring metrics from regional MPA monitoring plans (MPA Monitoring Enterprise 2010, 2011, 2014) (Appendix 1, Table 2). Each metric was tabulated and compared across the four regions to determine overlap and/or lack of overlap among regions. These metrics were used to evaluate alignment of monitoring efforts in California estuaries with the regional MPA monitoring plans.

### *Developing the estuarine and wetland monitoring database*

After the preliminary list of estuaries was assembled, we developed key attributes for each monitoring program among the candidate list of MPA and control sites. This information aimed to identify the key attributes for each target metric that has known monitoring. To avoid including shorter-term sampling or experimental programs that had no guarantee of commitment to long-term monitoring we set a definition of “long-term monitoring programs”. We used the recent definition of long-term monitoring being greater than four years commitment to monitoring (Hughes et al. 2017). By using this strict definition we were able to identify monitoring programs that are likely to extend into the future and worthy of assessing effects from MPAs.

Elkhorn Slough was the first site included in the database – it is a well-studied estuary with many known monitoring programs, and has some of the richest monitoring programs<sup>1</sup> among California estuaries outside of San Francisco Bay. Being part of the NERR system, the statewide MPA network, and a central location for researchers in Monterey Bay made this the ideal first site for this project.

While populating the database for Elkhorn Slough monitoring programs, we generated a list of researchers with potentially relevant monitoring programs and started contacting key researchers and managers. This list was generated using an exhaustive search, which included:

- A list of known fish monitoring in estuaries from the recent TNC and PMEP effort (Hughes et al. 2014).

<sup>1</sup><http://www.elkhornslough.org/research-program/>

- Professional contacts of the contractor.
- Suggestions from project partners.
- A list of all researchers conducting estuarine research according to the CDFW scientific collecting permit (SCP) database.
- Leads produced by contacts.

In total this effort produced contacts of 52 researchers and managers across California estuaries (List available upon request)<sup>1</sup>.

*Populating the MPA monitoring database, a multi-tiered approach*

Once contact was established with targeted researchers, we reached out to request information on relevant monitoring programs (see Appendix 2 for form letter requests). This approach began with an email introducing this project and major collaborators, followed with a few short questions:

- Do you monitor any of the following metrics (Table 1)?
- Is this monitoring program committed to the next five years or more?
- Can you provide me specific details about the monitoring program to populate the database?

**Table 1.** List of target metrics for estuarine monitoring listed for the MLPA monitoring process across all 4 regions (Figure 1).

<i>Acipenser</i> spp.	Marine mammal density
<i>Anas</i> spp.	Native oyster bed areal extent/abundance
<i>Anthya</i> spp.	<i>Oncorhynchus</i> spp.
Arthropod biomass	Pacific gaper clam abundance
Bat ray abundance	Parasite diversity
Black Brandt	pH/Carbonate chemistry
Black seaperch density & size structure	Pickleweed areal extent
CA halibut abundance & size frequency	Pile surfperch density & size structure
Cancer magister density	Piscivorous bird richness & abundance
Clam abundance and size frequency	Pleuronectidae
Common littleneck clam abundance	Scolopacidae
Croaker abundance & size frequency	Shorebird richness & abundance
Diamond turbot density & size structure	Spotted sand bass density & size structure
DO (dissolved oxygen)	Spp diversity (invert and fish functional groups)
Eelgrass areal extent	Spp richness (inverts and fishes)
Eelgrass density & % cover	Starry flounder abundance & size frequency
Fat innkeeper worm	Surfperch abundance & size frequency (any spp.)
Ghost and/or mud shrimp abundance	Topsmelt density & size structure
Gobies density & size structure	<i>Ulva</i> areal extent
Harbor porpoise	Washington clam abundance
Leopard shark density & size structure/abundance	Western Gull
Marine bird richness & abundance	

<sup>1</sup>Contact Erin Meyer ([erin.meyer@oceansciencetrust.org](mailto:erin.meyer@oceansciencetrust.org)) for access to the complete list of contacts.



For some of the lesser-known programs on the list and to further investigate potential programs, we performed online searches to find monitoring programs across the state, which included the following databases:

- California Environmental Exchange Network (CEDEN)
- CDFW
- NERR
- NEP
- San Onofre Nuclear Generating Station Mitigation Monitoring Program (SONGS)

These databases were checked for monitoring metrics and long-term commitment to monitoring. When applicable, researchers from each program were contacted to verify if monitoring was planned as long-term (> 4 years).

In addition, CDFW provided a list of all known research efforts in California estuaries based on their SCP database. We contacted all researchers in this database to ask them the multi-tiered questions as described above and limited any follow-up research (Appendix 2) to those programs/projects committed to long-term monitoring.

## Analysis and Results

Using our MPA monitoring database<sup>1</sup>, we generated summary figures of the following:

- Map of locations with known monitoring programs, coded as MPA v. non-MPAs (Figure 1).
- Assessment of target metrics across the coast (Table 1) to address the following questions:
  - What metrics are most common across MPAs?
  - What are the biggest gaps in target metrics?

Figures 2-18 show the distribution of monitoring programs where more than one site has monitoring of a given target metric.

### *What metrics are most common across MPAs?*

Out of all of the target metrics for the 23 MPA and 15 reference sites, dissolved oxygen (n = 7 MPAs, n = 6 reference sites), pH (n = 5 MPAs, n = 6 reference sites), and eelgrass areal extent (n = 6 MPAs, n = 4 reference sites) has the greatest number of long-term monitoring sites (Figures 2-3, Table 2). Each of the four regions has some monitoring of pH and DO, but only the North Coast lacks a reference site. For eelgrass, all regions except for the North Central Coast have monitoring, and the North Coast only has one MPA site.

### *What are the biggest gaps in target metrics, MPAs vs. Reference sites, and regions?*

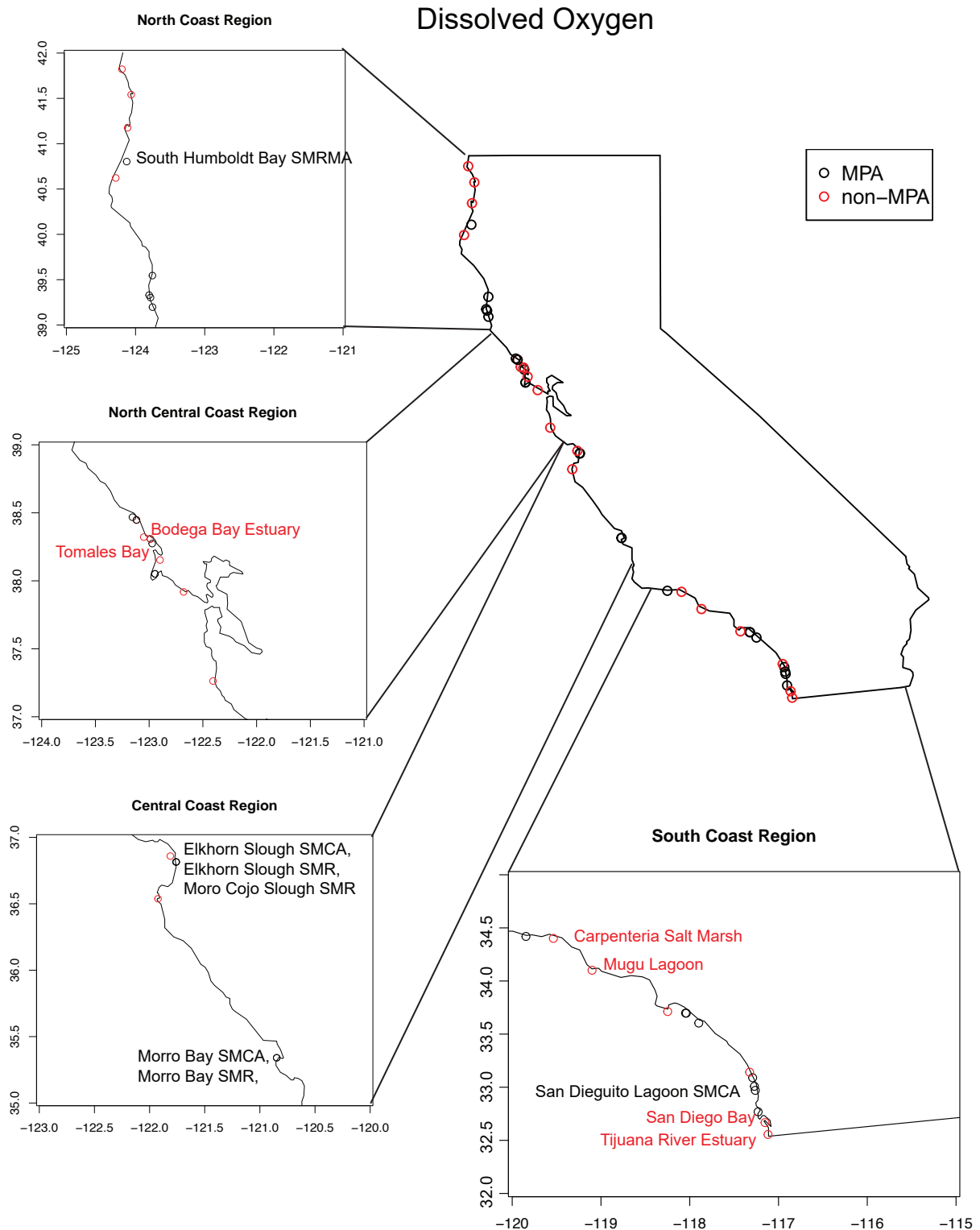
For this assessment of the 23 MPAs and 15 non-MPA reference sites (N = 38 sites), there appears to be a general lack of monitoring of estuaries (MPA or non-MPA) across the state of California. Other than DO, pH, and eelgrass areal extent, there are no other metrics monitored at ten or more monitoring sites (Table 2). However, it should be noted that most metrics are region-specific making it challenging to assess monitoring target metrics across the state.

<sup>1</sup>Contact Erin Meyer ([erin.meyer@oceansciencetrust.org](mailto:erin.meyer@oceansciencetrust.org)) for access to the monitoring database.

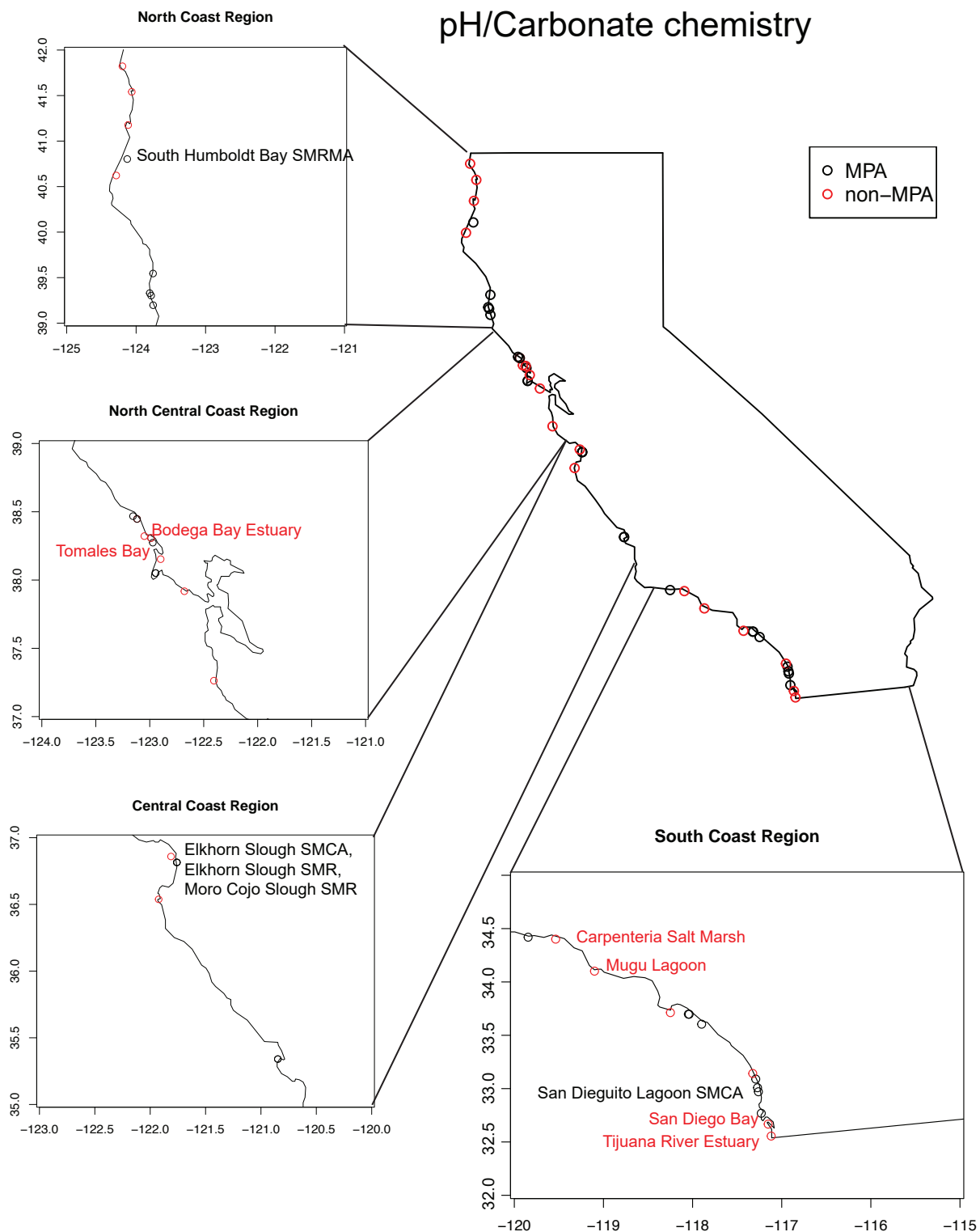
Over the entire state of California, monitoring programs are proportionally distributed among MPA sites ( $n = 77$ ) and non-MPA reference sites ( $n = 64$ ). However, at finer regional scales, these proportions are not consistent. For example, in the North Coast, only Humboldt Bay has representative monitoring programs, compared to only one non-MPA reference site, Eel River Estuary, where sturgeon is monitored. The Central Coast has good representation of monitoring in MPAs, but has no monitoring in non-MPA reference sites. This is partly due to the lack of estuaries in the region because of geological factors, and that the four MPAs (Elkhorn Slough SMR/ State Marine Conservation Area - SMCA, Moro Cojo Slough SMR, and Morro Bay State Marine Recreational Management Area - SMRMA) are monitored as part of two federal programs: NERR and NEP. The region with the most representation of monitoring programs is the South Coast (Table 2). This is expected because of the greater abundance of estuaries compared to the other regions (Hughes et al. 2014). However, certain programs exist, such as SONGS, which has long-term mitigation monitoring programs established at four estuaries (1 MPA, 3 non-MPA) in the region.

**Table 2.** Collated target monitoring metrics across the four coastal MPA regions. NA signifies that the metric is not a target metric for the region.

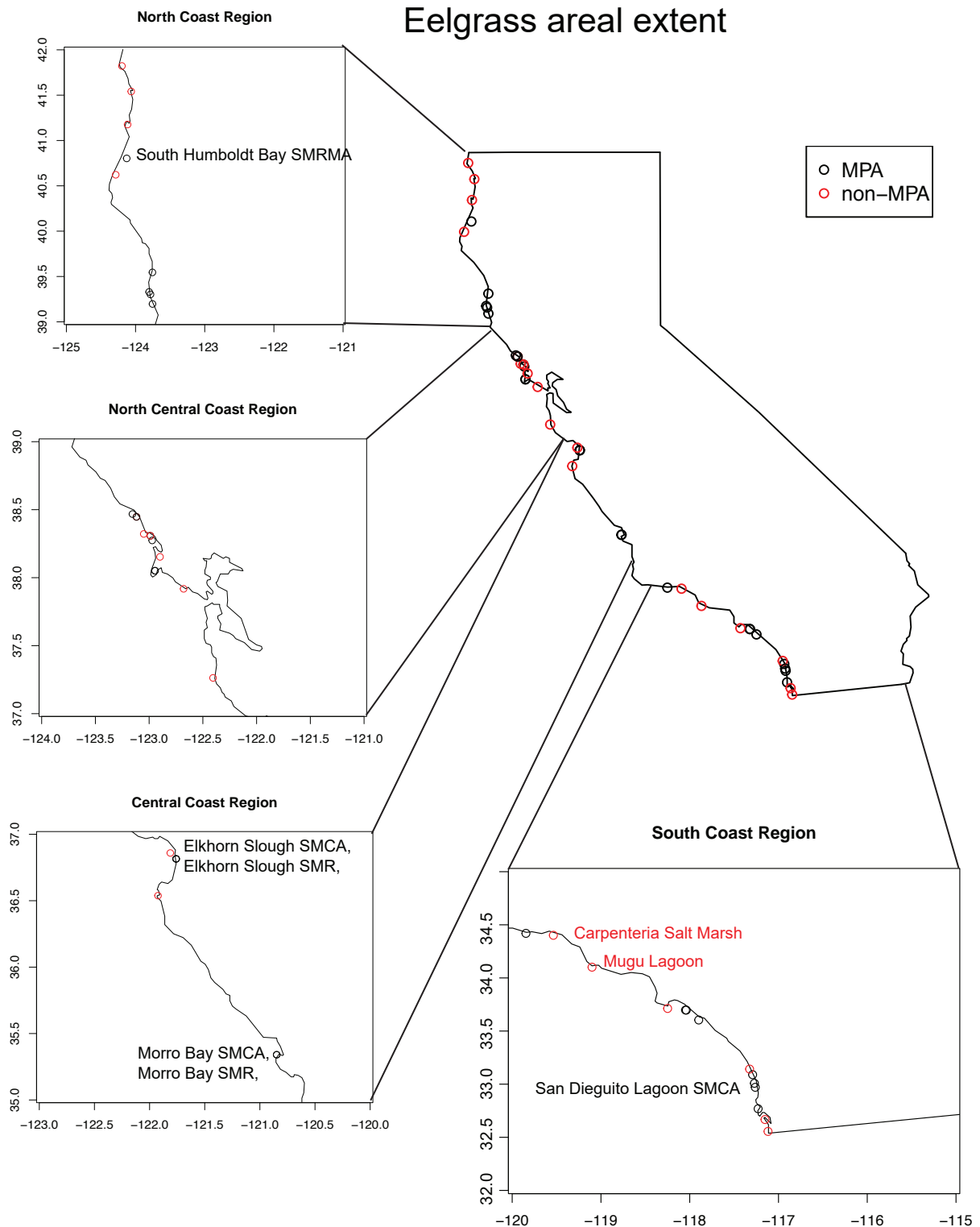
REGION, M = MPA (N = 23), R = Reference (N = 15)										
Target Metric	North		N. Central		Central		South		TOTAL	
	M	R	M	R	M	R	M	R	M	R
Acipenser spp.	0	1	NA	NA	NA	NA	NA	NA	0	1
Anas spp.	0	0	NA	NA	NA	NA	NA	NA	0	0
Anthya spp.	0	0	NA	NA	NA	NA	NA	NA	0	0
Arthropod biomass	0	0	NA	NA	NA	NA	1	3	1	3
Bat ray abundance	0	0	0	0	NA	NA	NA	NA	0	0
Black Brandt	0	0	NA	NA	NA	NA	NA	NA	0	0
Black seaperch density & size structure	NA	NA	NA	NA	0	0	NA	NA	0	0
CA halibut abundance & size frequency	1	0	0	0	NA	NA	1	3	2	3
Cancer magister density	0	0	NA	NA	NA	NA	NA	NA	0	0
Clam abundance and size frequency	0	0	0	0	3	0	1	3	4	3
Common littleneck clam abundance	0	0	0	0	NA	NA	1	3	1	3
Croaker abundance & size frequency	NA	NA	NA	NA	NA	NA	1	3	1	3
Diamond turbot density & size structure	NA	NA	NA	NA	0	0	NA	NA	0	0
DO (dissolved oxygen)	1	0	0	2	5	0	1	4	7	6
Eelgrass areal extent	1	0	0	0	4	0	1	4	6	4
Eelgrass density & % cover	0	0	0	0	1	0	0	0	1	0
Fat innkeeper worm	0	0	0	0	1	0	NA	NA	1	0
Ghost and/or mud shrimp abundance	0	0	0	0	0	0	1	3	1	3
Gobies density & size structure	1	0	NA	NA	NA	NA	1	3	2	3
Harbor porpoise	0	0	NA	NA	NA	NA	NA	NA	0	0
Leopard shark density & size/abundance	1	0	0	0	NA	NA	1	3	2	3
Marine bird richness & abundance	0	0	2	0	5	0	0	0	7	0
Marine mammal density	0	0	2	0	5	0	0	0	7	0
Native oyster bed areal extent/abundance	0	0	0	0	2	0	NA	NA	2	0
Oncorhynchus spp.	1	0	NA	NA	NA	NA	NA	NA	1	0
Pacific gaper clam abundance	0	0	0	0	1	0	0	3	1	3
Parasite diversity	NA	NA	NA	NA	NA	NA	0	0	0	0
pH/Carbonate chemistry	1	0	0	2	3	0	1	4	5	6
Pickleweed areal extent	NA	NA	0	0	NA	NA	1	4	1	4
Pile surfperch density & size structure	NA	NA	NA	NA	0	0	NA	NA	0	0
Piscivorous bird richness & abundance	0	0	NA	NA	5	0	0	0	5	0
Pleuronectidae	1	0	NA	NA	NA	NA	NA	NA	1	0
Scolopacidae	0	0	NA	NA	NA	NA	NA	NA	0	0
Shorebird richness & abundance	0	0	NA	NA	5	0	0	0	5	0
Spotted sand bass density & size structure	0	0	NA	NA	NA	NA	NA	NA	0	0
Spp diversity (invert and fish functional groups)	NA	NA	0	0	NA	NA	3	3	3	3
Spp richness (inverts and fishes)	NA	NA	0	0	NA	NA	3	3	3	3
Starry flounder abundance & size frequency	1	0	0	0	NA	NA	NA	NA	1	0
Surfperch abundance & size frequency	0	0	NA	NA	0	0	NA	NA	0	0
Topsmelt density & size structure	NA	NA	NA	NA	0	0	1	3	1	3
Ulva areal extent	0	0	0	0	3	0	NA	NA	3	0
Washington clam abundance	NA	NA	NA	NA	NA	NA	1	3	1	3
Western Gull	0	0	NA	NA	NA	NA	NA	NA	0	0
<b>TOTAL</b>	<b>9</b>	<b>1</b>	<b>8</b>	<b>4</b>	<b>43</b>	<b>0</b>	<b>21</b>	<b>59</b>	<b>77</b>	<b>64</b>



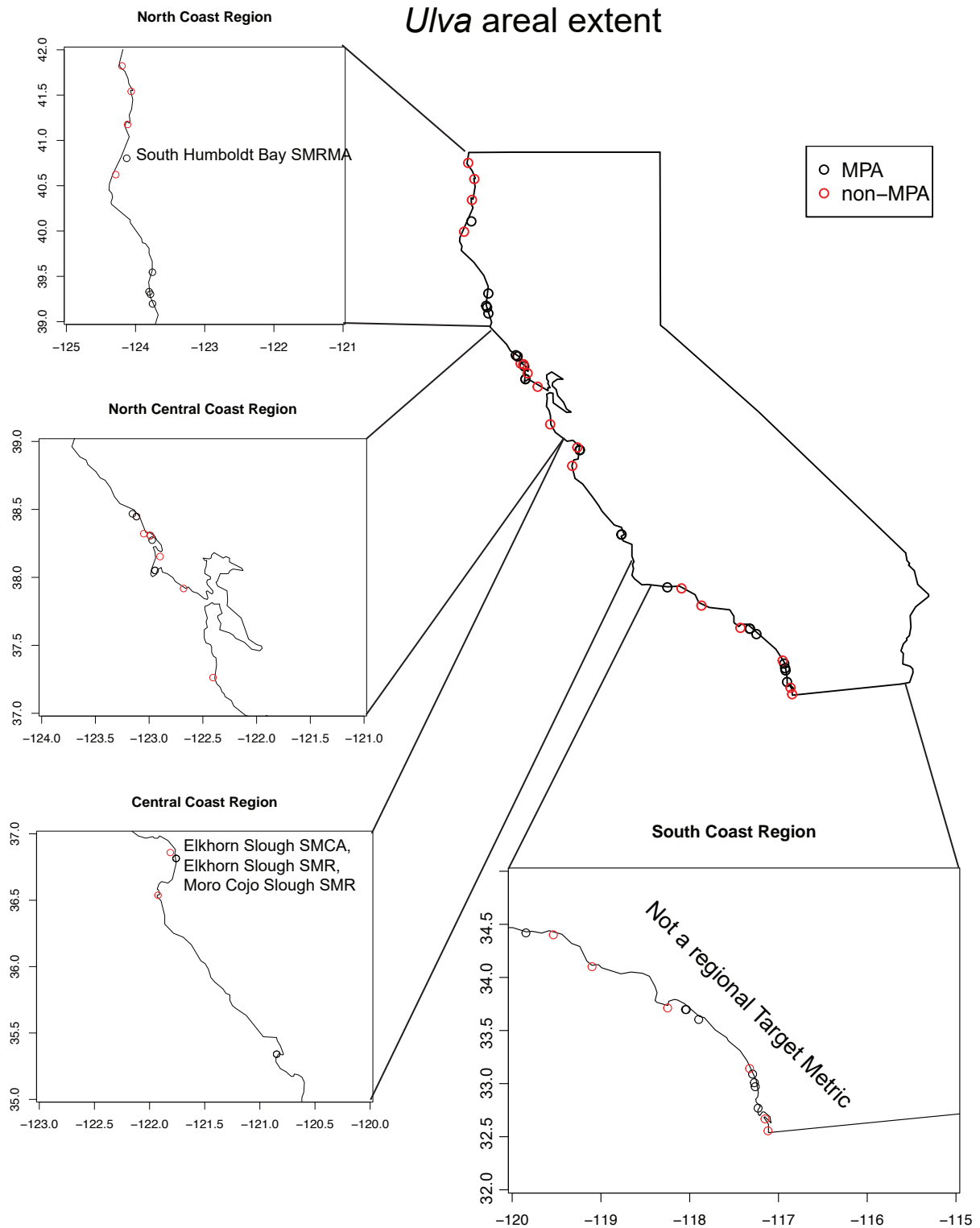
**Figure 2.** Distribution of dissolved oxygen monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



**Figure 3.** Distribution of pH monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.

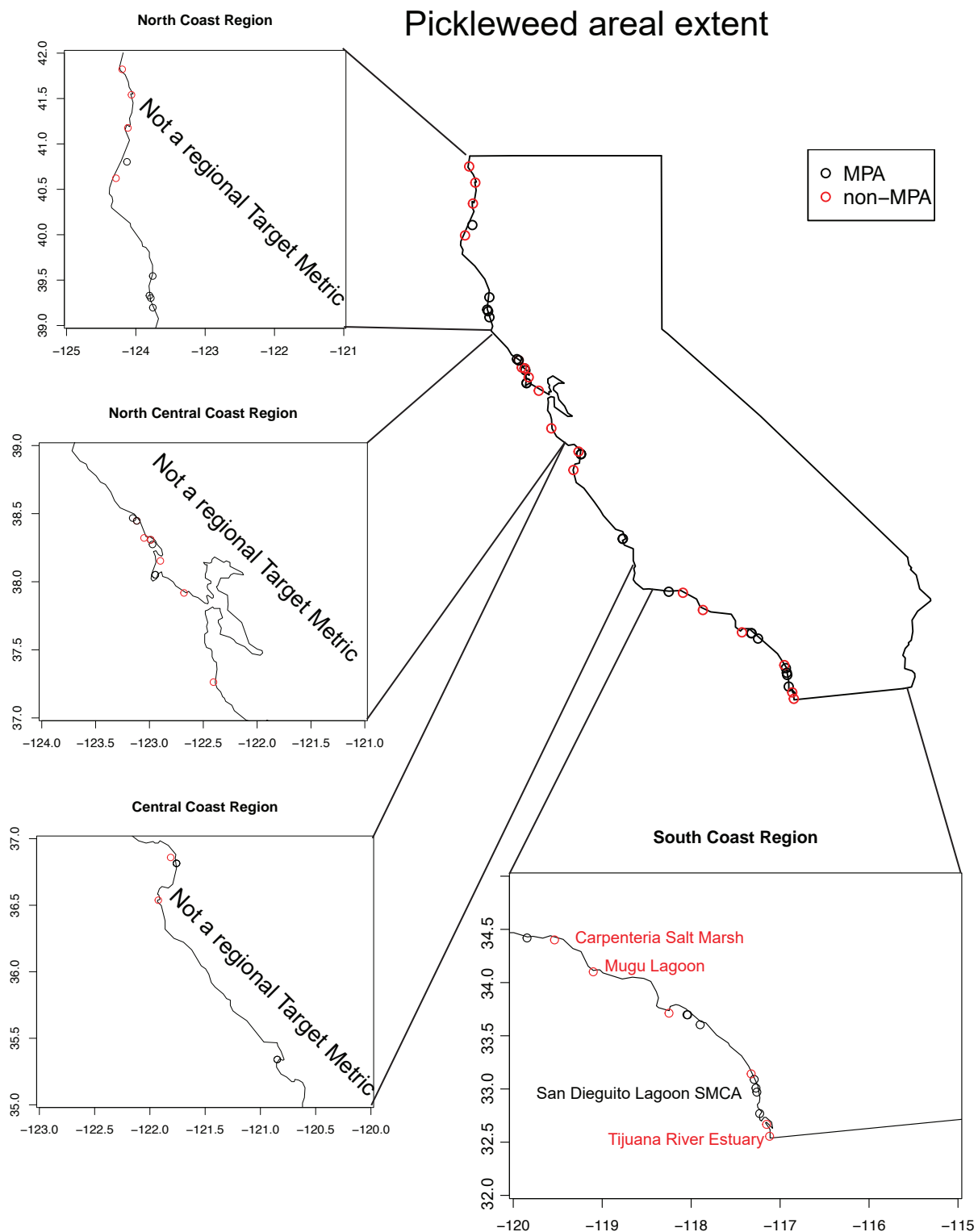


**Figure 4.** Distribution of eelgrass (*Zostera marina*) monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.

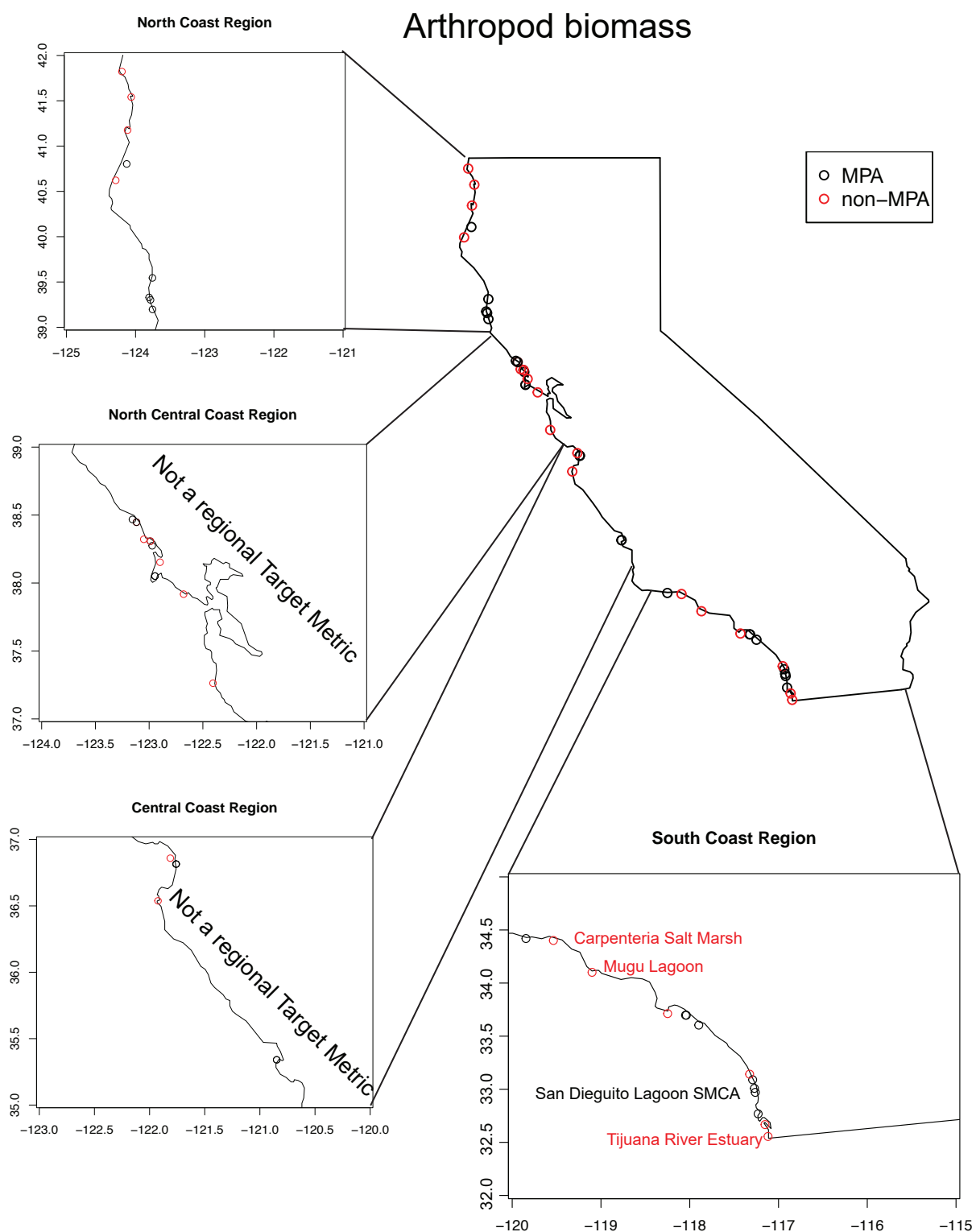


**Figure 5.** Distribution of green alga *Ulva* spp. monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.

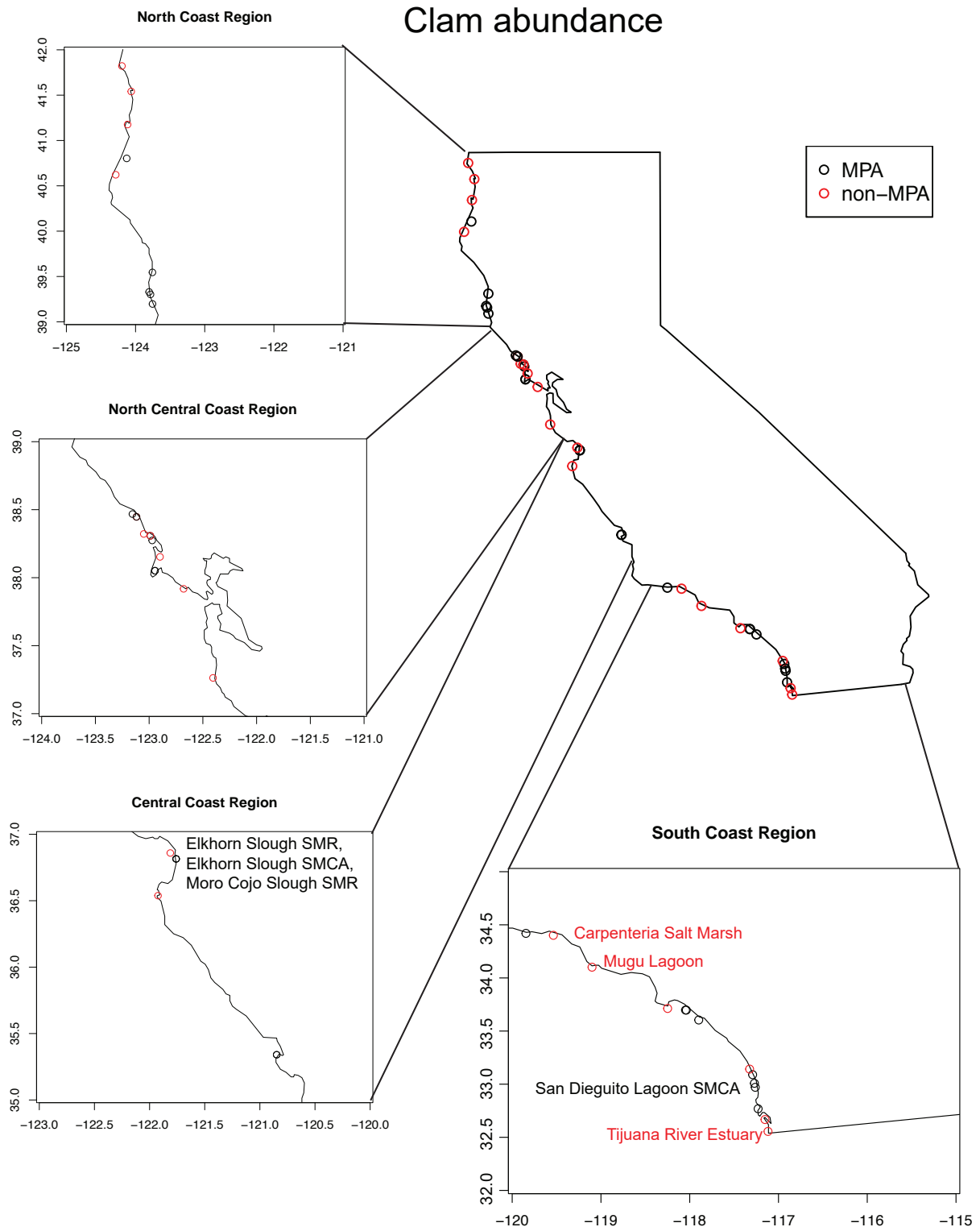




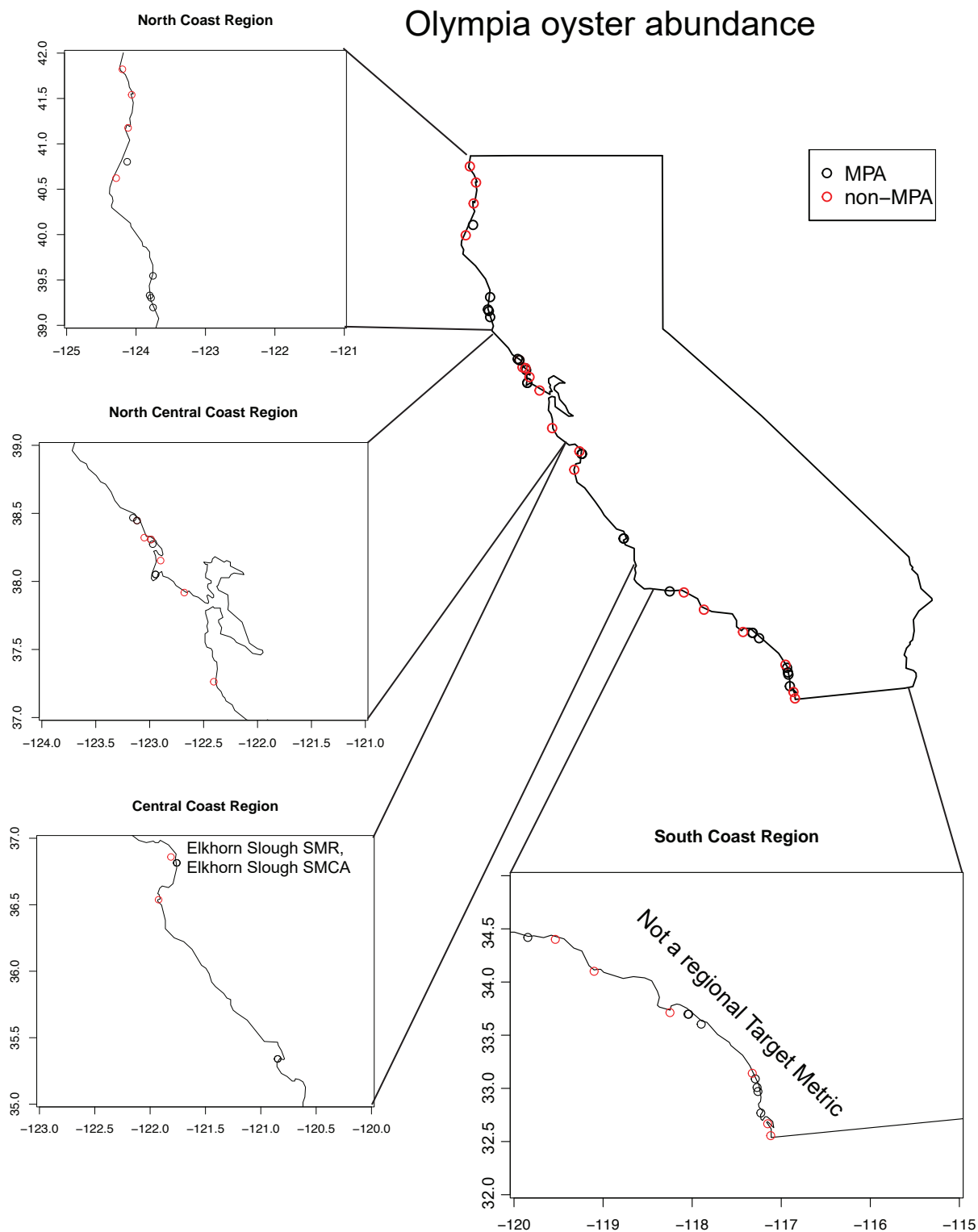
**Figure 6.** Distribution of pickleweed salt marsh (*Salicornia virginica*) monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



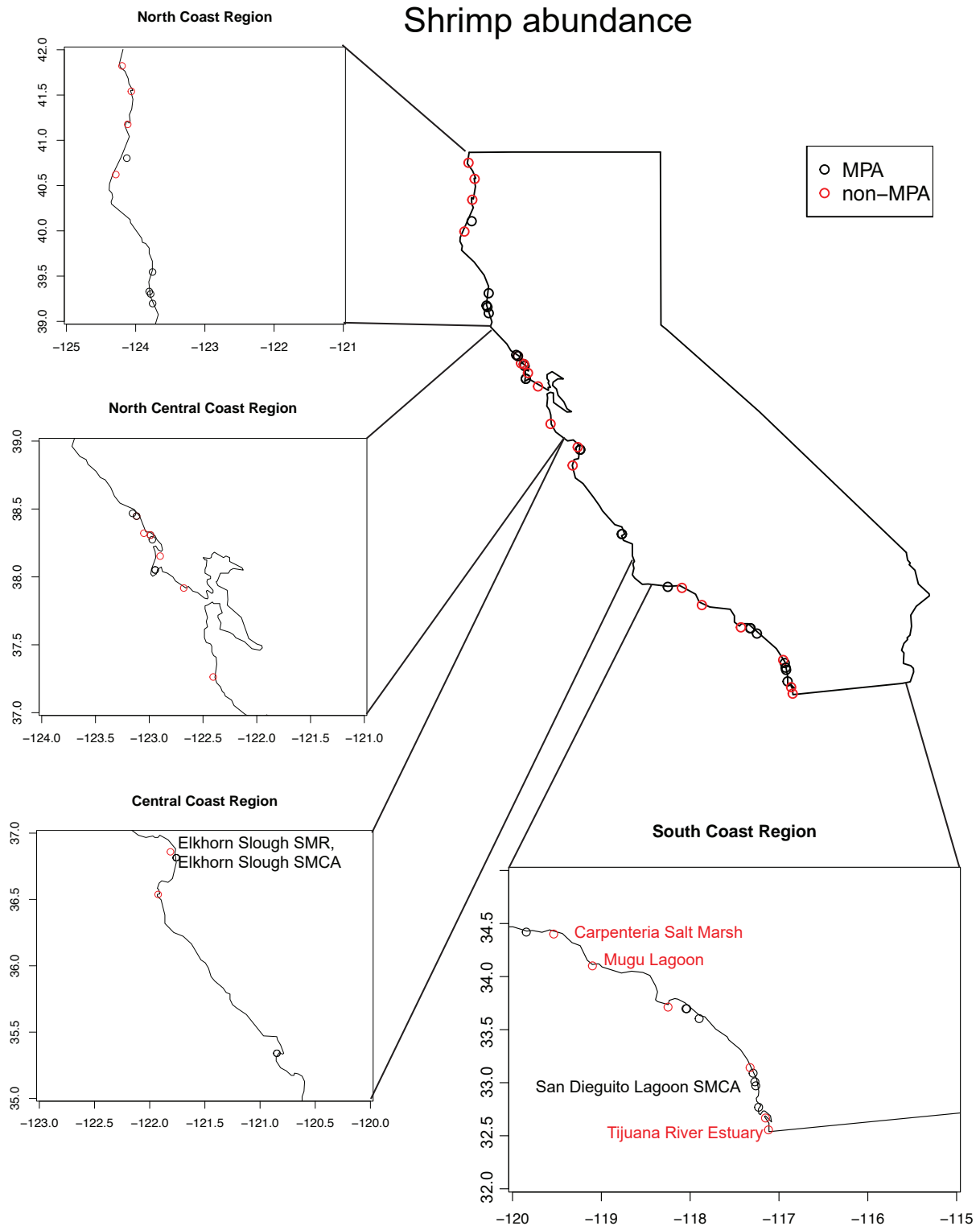
**Figure 7.** Distribution of arthropod biomass monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



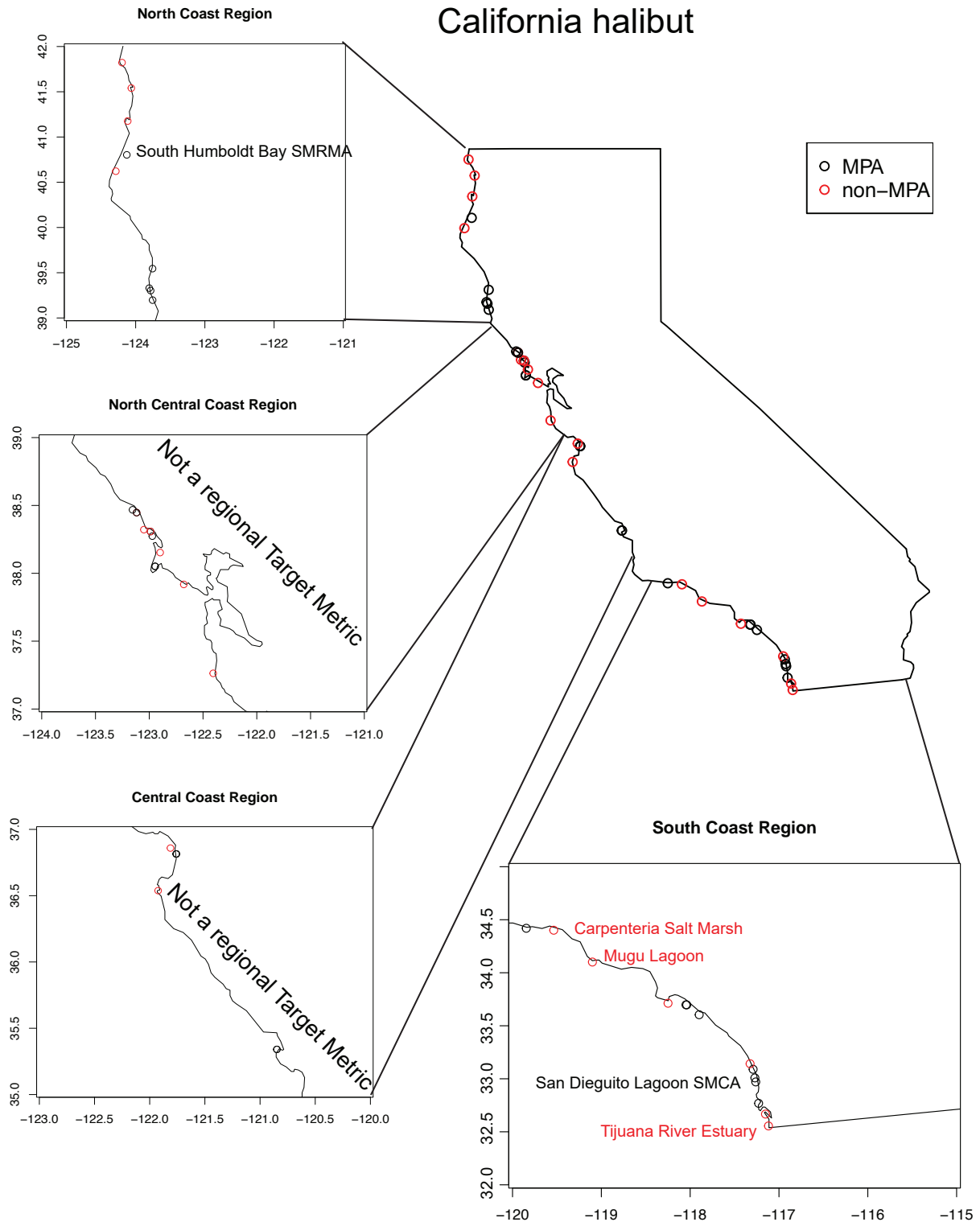
**Figure 8.** Distribution of clam abundance monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



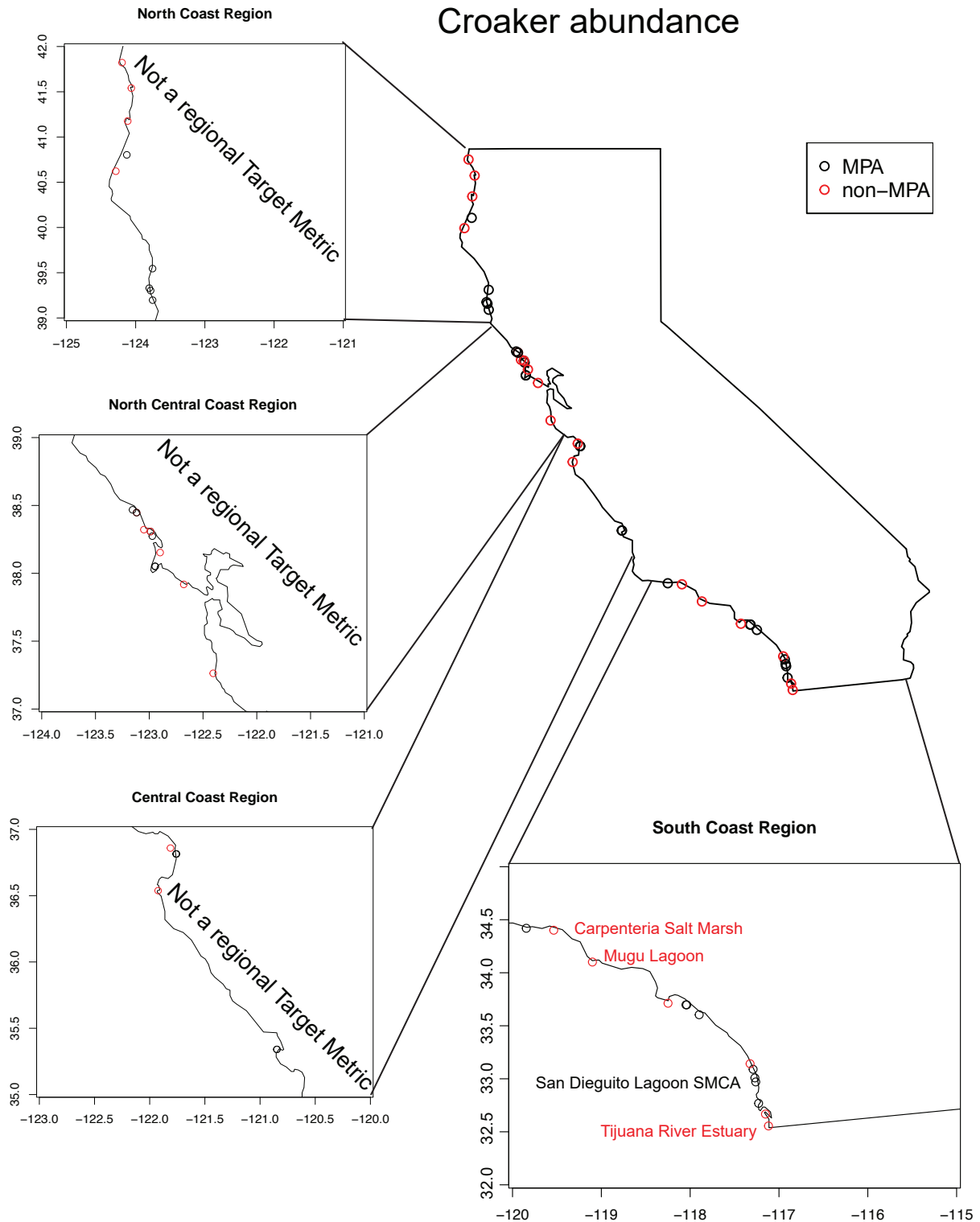
**Figure 8.** Distribution of Olympia oyster (*Ostrea lurida*) monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



**Figure 9.** Distribution of shrimp monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.

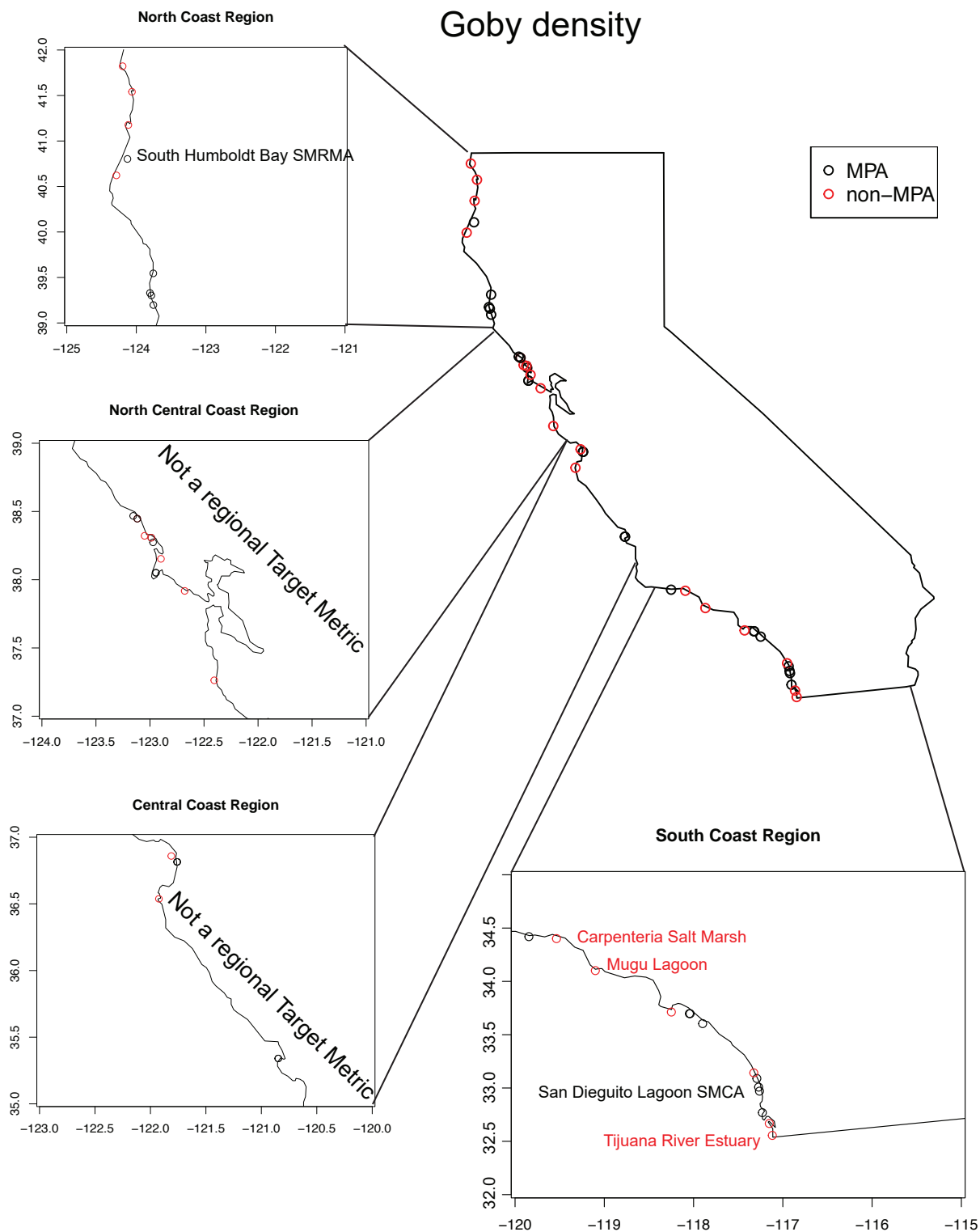


**Figure 10.** Distribution of California halibut (*Paralichthys californicus*) monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.

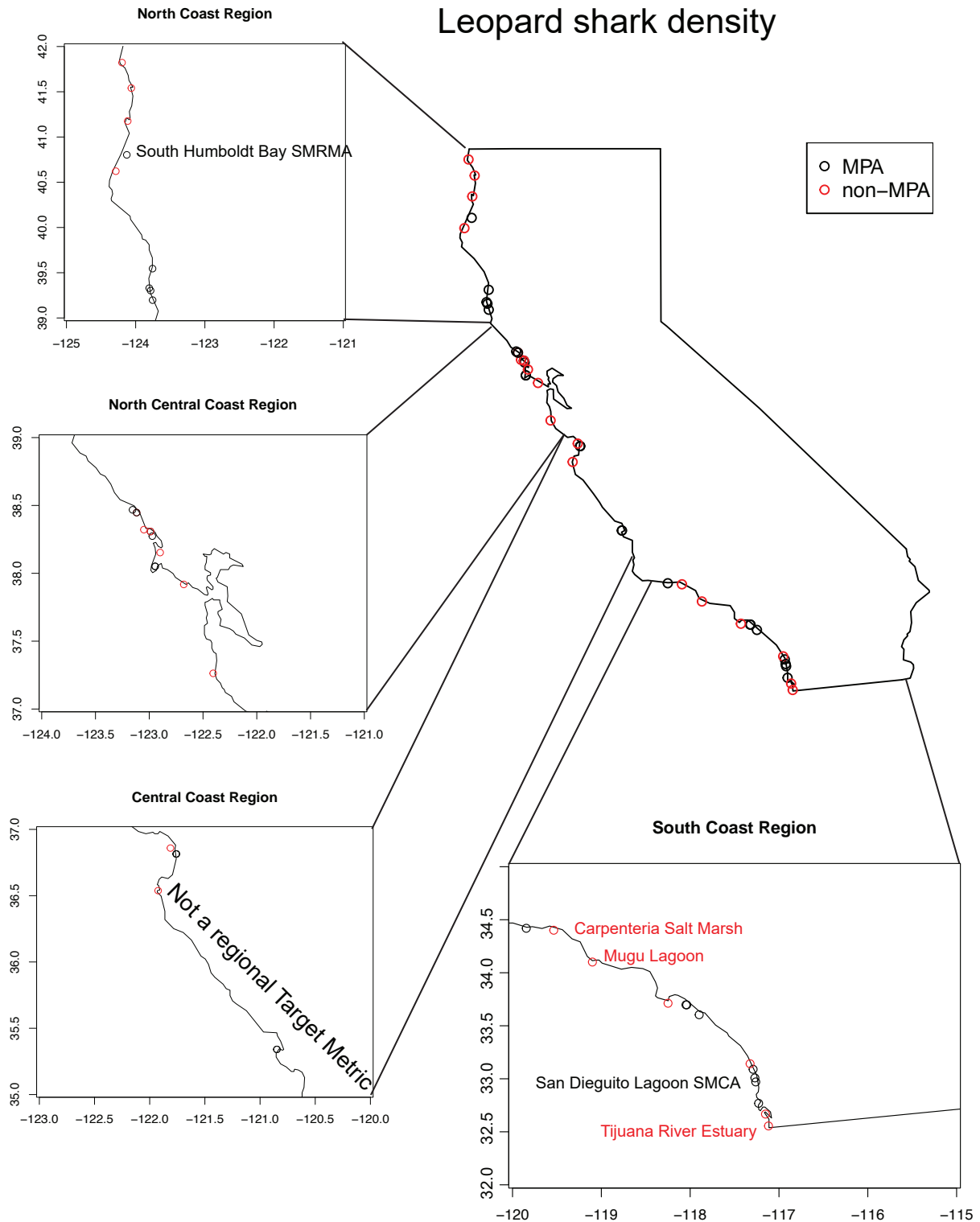


**Figure 11.** Distribution of croaker (*Menticirrhus* sp.) monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.

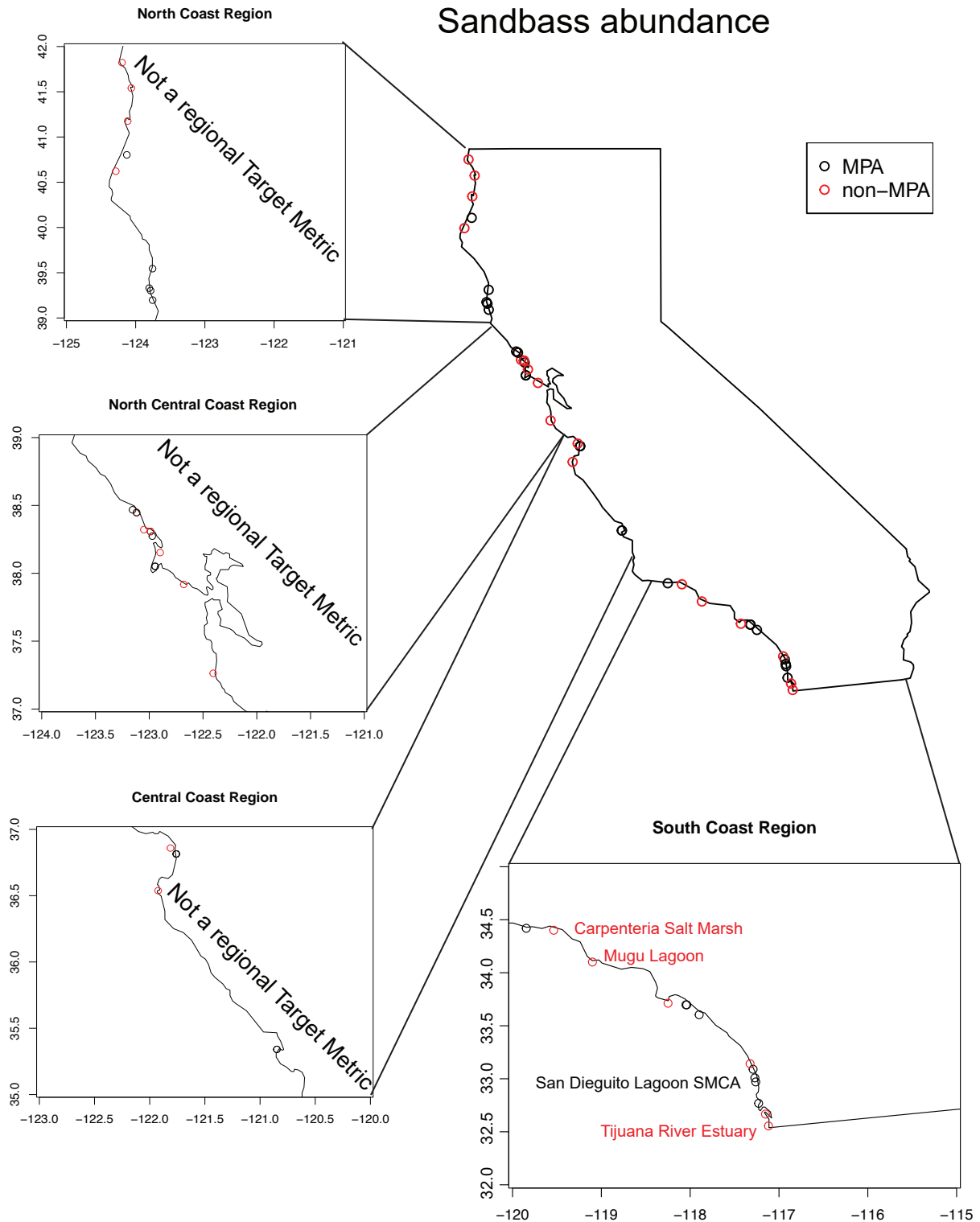




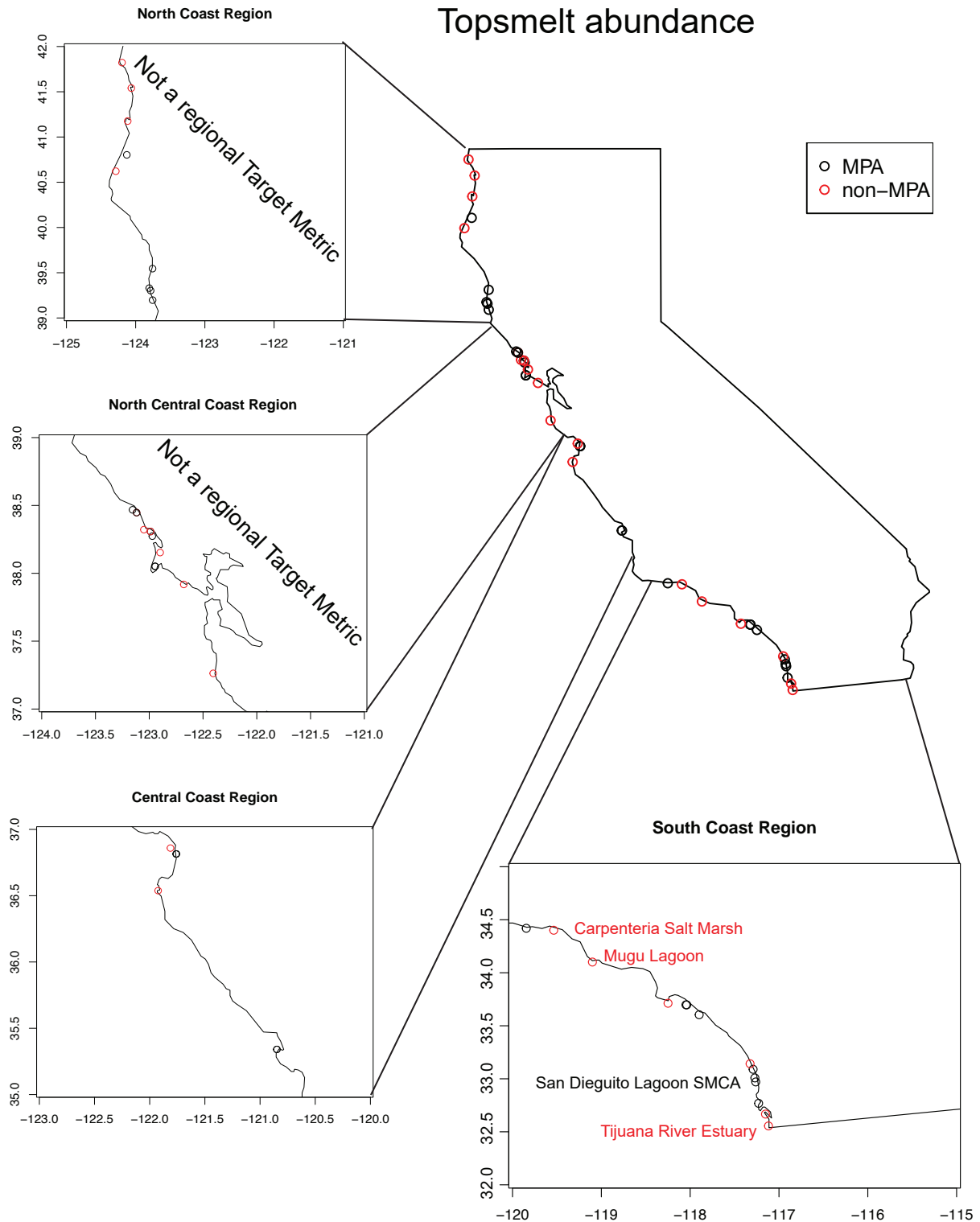
**Figure 12.** Distribution of Goby (family Gobiidae) monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



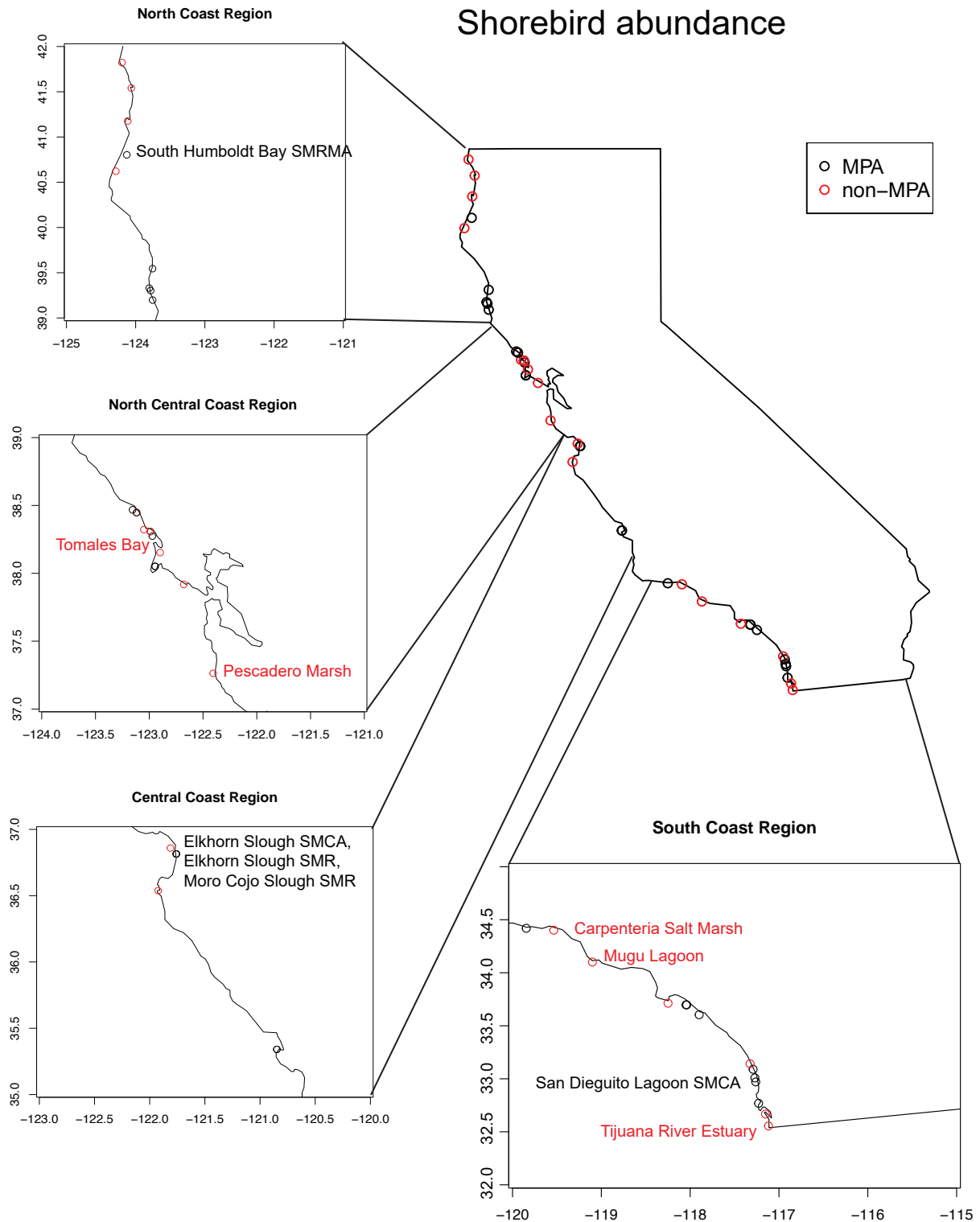
**Figure 13.** Distribution of leopard shark (*Triakis semifasciata*) monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



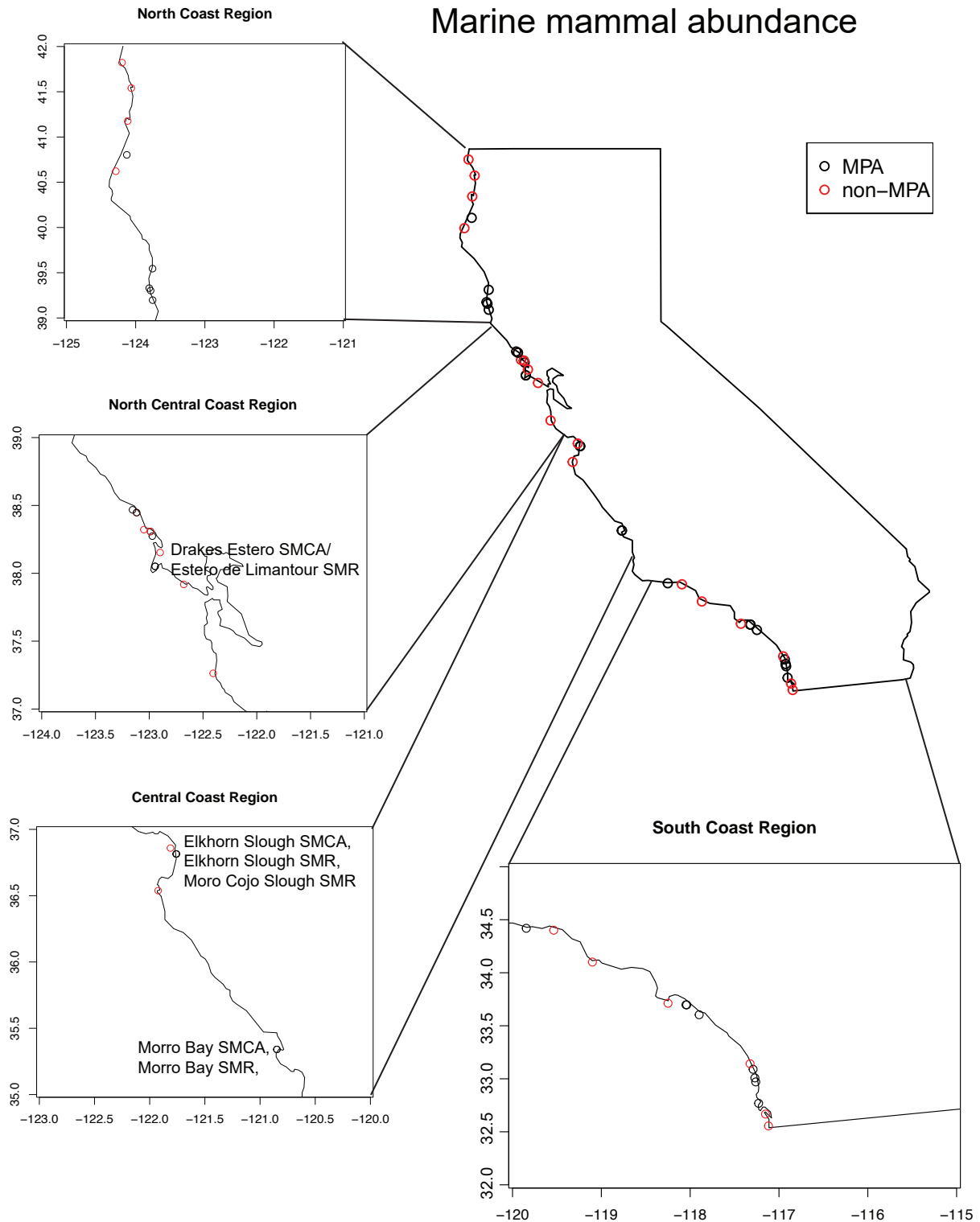
**Figure 14.** Distribution of spotted sandbass (*Paralabrax maculatofasciatus*) monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



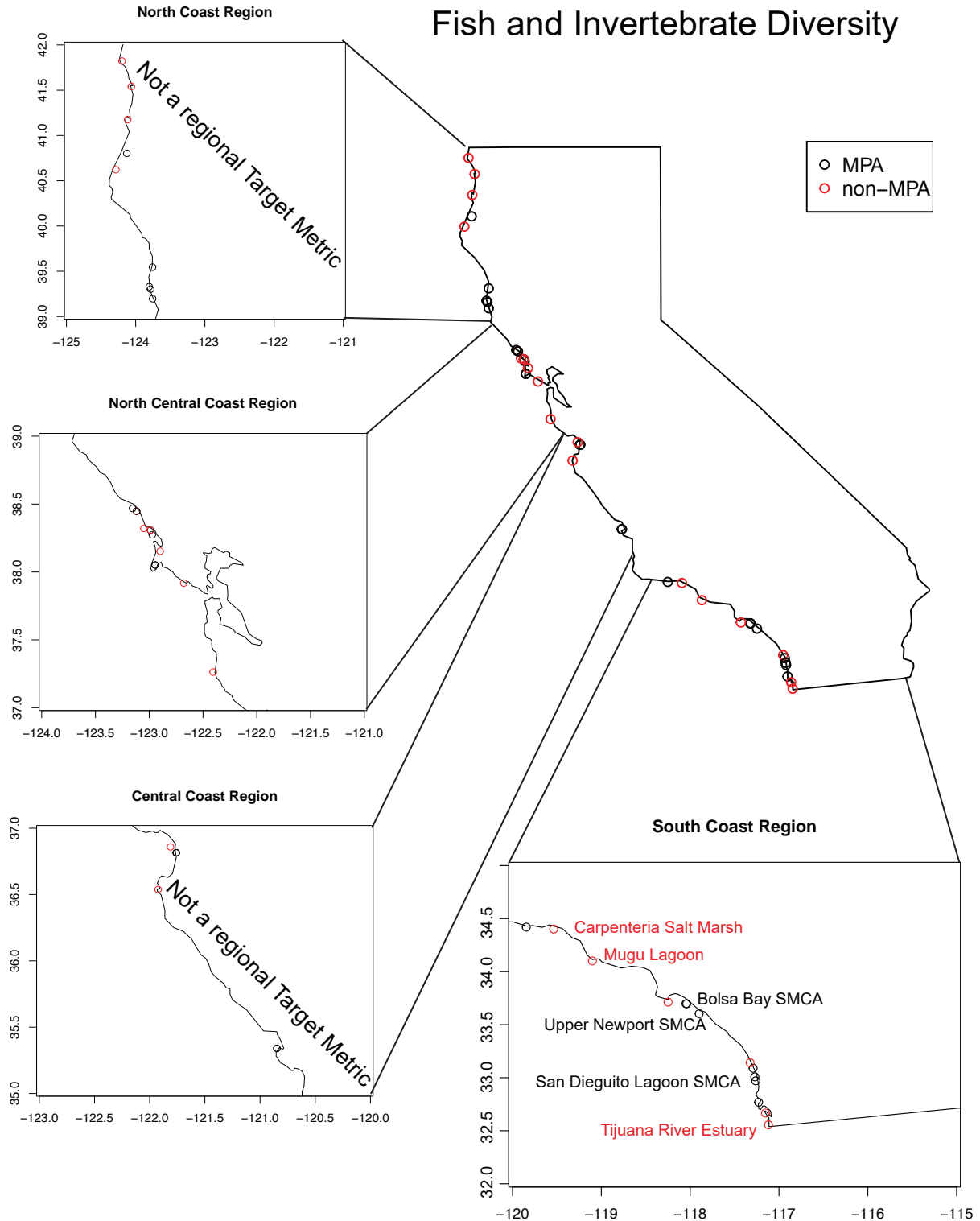
**Figure 15.** Distribution of topsmelt (*Atherinops affinis*) monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



**Figure 16.** Distribution of shorebird monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



**Figure 17.** Distribution of marine mammal monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



**Figure 18.** Distribution of species diversity monitoring programs in estuarine MPAs (black) and non-MPA reference sites (red) in four regions across California.



## Discussion, Recommendations and Next Steps

### *Paucity of existing monitoring programs and funding for CA estuaries*

This project demonstrates that there is a general lack of monitoring in California estuaries, including within the MPA network. The programs that do exist are not integrated into a larger network. This translates to a lack of standardized methodologies making it difficult to assess MPA performance and goals.

Throughout the four regions targeted in this report there are few target metrics that are consistent across the entire range (Table 2). The metrics that are targets across all four regions include: 1) eelgrass areal coverage, 2) clam abundance, 3) marine/shorebird abundance, 4) marine mammal abundance, 5) DO, and 6) pH. The latter two were not originally target metrics from the Regional Monitoring Plans (MPA Monitoring Enterprise 2010, 2011, 2014), but were added based on OST and OPC recommendations. These six target metrics could be used as indicators of condition across estuarine MPAs and reference sites given the higher overall distribution of these six metrics.

Funding for long-term monitoring is generally lacking across the world. Trends in funding indicate the investment into long-term monitoring is going down (Hughes et al. 2017). Within the California MPA network, investment in monitoring estuarine and wetland ecosystems has fallen behind other MPA ecosystems (e.g., kelp forests and rocky intertidal). Without more funding California estuarine MPAs might not meet essential monitoring goals, or, if left to only a few target metrics, monitoring might not capture MPA performance.

### *Recommendations moving forward*

Other than the six consistently monitored target metrics, other metrics could be added to a statewide monitoring program. Marine vegetation (e.g., seagrass, macroalgae, salt marsh) is consistently found in estuaries across the entire state. Various types of vegetation are also indicators of change resulting from either increased human stress or management (Cloern 2001, Dyke and Wasson 2005, Hughes et al. 2011). For example, healthy and stable seagrass beds and salt marshes (e.g., *Zostera marina*) are indicators of a healthy ecosystem (Waycott et al. 2009). Whereas certain species of macroalgae (e.g., *Ulva* sp. and *Gracilaria* sp.) can be indicators of nutrient overenrichment (Burkholder et al. 1992, 2007, Huntington and Boyer 2008). Additionally, marine vegetation is relatively easy to monitor from LIDAR and aerial photography, so effort in monitoring is minimal compared to other metrics. Salt marshes, a key feature of almost every estuary in California, are conspicuously absent in monitoring programs across the state, or where there is monitoring of salt marshes they are not in a region in which they are recognized as a target metric (Table 2).

Other recommendations from results of this effort and other researcher input include:

- Salinity: should be a commonly targeted metric as it can inform on changes in land-use, and can be a good predictor of estuarine communities.
- Nutrients (nitrate, ammonia, phosphate): Are key drivers of estuarine food-webs and can shift community states (Cloern 2001)
- Invasive species: the presence of invasive species is a key feature of California estuaries and is a good indicator of overall estuary health.

- Olympia oysters: These populations have suffered heavy losses over the last century due to poor water quality and species invasions (Cheng et al. 2015, Jeppesen et al. 2016, Wasson et al. 2016). They are also relatively easy to monitor.
- Fish sampling: protocols should be developed to standardize monitoring of fish communities because they could achieve monitoring objectives for many target metrics (Tables 1 and 2). Developing standardized beach seining could help achieve these goals.
- Estuarine MPA Symposium: There is now a need for to bring together key estuarine researchers (e.g., conference, symposium, workshop) to:
  - Search for traditional and non-traditional funding sources.
  - Integrate metrics and sampling protocols
  - Develop control sites that will be used to measure MPA effectiveness.
  - Addressing key monitoring gaps.
  - Develop a network of researchers across the state, much like Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), ReefCheck, or NERR.
  - This could be achieved using regional conferences, such as CAERS<sup>1</sup>.

<sup>1</sup><http://caers.squarespace.com>

## Literature Cited

- Ahmadia, G. N., L. Glew, M. Provost, D. Gill, N. I. Hidayat, S. Mangubhai, Purwanto, and H. E. Fox. 2015. Integrating impact evaluation in the design and implementation of monitoring marine protected areas. *Philosophical Transactions of the Royal Society B* 370:20140275.
- Burkholder, J. M., D. A. Tomasko, and B. W. Touchette. 2007. Seagrasses and eutrophication. *Journal of Experimental Marine Biology and Ecology* 350:46–72.
- Burkholder, J., K. Mason, and H. G. Jr. 1992. Water-column nitrate enrichment promotes decline of eelgrass *Zostera marina*: evidence from seasonal mesocosm experiments. *Marine Ecology Progress Series* 81:163–178.
- Cheng, B. S., J. M. Bible, A. L. Chang, M. C. Ferner, K. Wasson, C. J. Zabin, M. Latta, A. Deck, A. E. Todgham, and E. D. Grosholz. 2015. Testing local and global stressor impacts on a coastal foundation species using an ecologically realistic framework. *Global Change Biology*:2488–2499.
- Cloern, J. 2001. Our evolving conceptual model of the coastal eutrophication problem. *Marine Ecology Progress Series* 210:223–253.
- Dyke, E. Van, and K. Wasson. 2005. Historical ecology of a central California estuary: 150 years of habitat change. *Estuaries* 28:173–189.
- Gaines, S. D., C. White, M. H. Carr, and S. R. Palumbi. 2010. Designing marine reserve networks for both conservation and fisheries management. *Proceedings of the National Academy of Sciences of the United States of America* 107:18286–18293.
- Gill, D. A., M. B. Mascia, G. N. Ahmadia, L. Glew, S. E. Lester, M. Barnes, I. Craigie, E. S. Darling, C. M. Free, J. Geldmann, S. Holst, O. P. Jensen, A. T. White, X. Basurto, L. Coad, R. D. Gates, G. Guannel, P. J. Mumby, H. Thomas, S. Whitmee, S. Woodley, and H. E. Fox. 2017. Capacity shortfalls hinder the performance of marine protected areas globally. *Nature* 543:665–669.
- Hughes, B. B., R. Beas-Luna, A. K. Barner, K. Brewitt, D. R. Brumbaugh, E. B. Cerny-Chipman, S. L. Close, K. E. Coblenz, K. L. de Nesnera, S. T. Drobnitch, J. D. Figurski, B. Focht, M. Friedman, J. Freiwald, K. K. Heady, W. N. Heady, A. Hettinger, A. Johnson, K. A. Karr, B. Mahoney, M. M. Moritsch, A.-M. K. Osterback, J. Reimer, J. Robinson, T. Rohrer, J. M. Rose, M. Sabal, L. M. Segui, C. Shen, J. Sullivan, R. Zuercher, P. T. Raimondi, B. A. Menge, K. Grorud-Colvert, M. Novak, and M. H. Carr. 2017. Long-Term Studies Contribute Disproportionately to Ecology and Policy. *BioScience* 67:271–281.
- Hughes, B. B., J. Haskins, K. Wasson, and E. Watson. 2011. Identifying factors that influence expression of eutrophication in a central California estuary. *Marine Ecology Progress Series* 439:31–43.
- Hughes, B., M. Levey, J. Brown, M. Fountain, A. Carlisle, S. Litvin, W. Heady, M. Gleason, and G. Correigh. 2014. Nursery functions of U.S. west coast estuaries: the state of the knowledge for juveniles of fifteen representative fish and invertebrate species. A Report for the The Nature Conservancy and the Pacific Marine and Estuarine Fish Habitat Partnership, 172 pp.
- Huntington, B., and K. Boyer. 2008. Effects of red macroalgal (*Gracilariopsis* sp.) abundance on eelgrass *Zostera marina* in Tomales Bay, California, USA. *Marine Ecology Progress Series* 367:133–142.
- Jeppesen, R., M. Rodriguez, J. Rinde, J. Haskins, B. Hughes, L. Mehner, and K. Wasson. 2016. Effects of Hypoxia on Fish Survival and Oyster Growth in a Highly Eutrophic Estuary. *Estuaries and Coasts*:1–10.
- MLPA-Partnership. 2016. Developing Long-Term Ecosystem Monitoring Recommendations for Marine and Coastal Decision Makers Planning for Change. Sacramento, CA.
- MPA Monitoring Enterprise. 2010. North Coast MPA Monitoring Plan. Oakland, CA.
- MPA Monitoring Enterprise. 2011. South Coast California MPA Monitoring Plan. Oakland, CA.

- MPA Monitoring Enterprise. 2014. Central Coast MPA Monitoring Plan. Oakland, CA.
- Wasson, K., B. B. Hughes, J. S. Berriman, A. L. Chang, A. K. Deck, P. A. Dinnel, C. Endris, M. Espinoza, S. Dudas, M. C. Ferner, E. D. Grosholz, D. Kimbro, J. L. Ruesink, A. C. Trimble, D. Vander Schaaf, C. J. Zabin, and D. C. Zacherl. 2016. Coast-wide recruitment dynamics of Olympia oysters reveal limited synchrony and multiple predictors of failure. *Ecology*.
- Waycott, M., C. M. Duarte, T. J. B. Carruthers, R. J. Orth, W. C. Dennison, S. Olyarnik, A. Calladine, J. W. Fourqurean, K. L. Heck, A. R. Hughes, G. A. Kendrick, W. J. Kenworthy, F. T. Short, and S. L. Williams. 2009. Accelerating loss of seagrasses across the globe threatens coastal ecosystems. *Proceedings of the National Academy of Sciences of the United States of America* 106:12377–81.

## APPENDIX 1: TABLES

**Table 1.** Cross-walk of estuaries from the PMEP/TNC inventory of 303 California estuaries and the MPA network, along with non-MPA reference sites. Ha = Hectares, Lat = Latitude, Long = Longitude. Coastal and Marine Ecological Classification Standard (CMECS) categories determines estuary types based on local geology.

Estuary_PMEP	Estuary_MPA	MPA_type	Ha_PMEP	Lat_PMEP	Long_PMEP	CMECS	Region_MPA
Lake Earl	Reference	NA	1565	41.821	-124.196	Lagoonal Estuary	North Coast
Klamath River	Reference	NA	375	41.540	-124.062	Riverine Estuary	North Coast
Big Lagoon	Reference	NA	720	41.176	-124.114	Lagoonal Estuary	North Coast
Humboldt Bay	South Humboldt Bay SMRMA	SMRMA	7211	40.802	-124.127	Embayment/Bay	North Coast
Eel River	Reference	NA	1277	40.622	-124.286	Riverine Estuary	North Coast
Ten Mile River	Ten Mile Estuary	SMCA	61	39.545	-123.756	Lagoonal Estuary	North Coast
Russian Gulch (Mendocino)	Russian Gulch SMCA	SMCA	1	39.329	-123.803	Lagoonal Estuary	North Coast
Big River Mendocino	Big River Estuary SMCA	SMCA	91	39.302	-123.783	Riverine Estuary	North Coast
Navarro River	Navarro River Estuary SMCA	SMCA	36	39.197	-123.754	Lagoonal Estuary	North Coast
Russian Gulch (Sonoma)	Russian River SMCA	SMCA	2	38.467	-123.155	Lagoonal Estuary	North Central Coast
Russian River	Russian River SMRMA	SMRMA	172	38.447	-123.117	Lagoonal Estuary	North Central Coast
Bodega Bay Estuary	Reference	NA	372	38.321	-123.049	Embayment/Bay	North Central Coast
Estero Americano	Estero Americano SMRMA	SMRMA	65	38.307	-122.988	Lagoonal Estuary	North Central Coast
Estero de San Antonio	Estero de San Antonio SMRMA	SMRMA	17	38.273	-122.971	Lagoonal Estuary	North Central Coast
Tomaes Bay	Reference	NA	3126	38.153	-122.898	Embayment/Bay	North Central Coast
Drakes Estero/Estero de Limantour	Drakes Estero SMCA	SMCA	1115	38.051	-122.945	Embayment/Bay	North Central Coast
Drakes Estero/Estero de Limantour	Estero de Limantour SMR	SMR	1115	38.051	-122.945	Embayment/Bay	North Central Coast
Bolinas Lagoon	Reference	NA	471	37.918	-122.679	Embayment/Bay	North Central Coast
Pescadero Marsh	Reference	NA	124	37.262	-122.405	Lagoonal Estuary	Central Coast
Pajaro River	Reference	NA	82	36.859	-121.812	Lagoonal Estuary	Central Coast
Elkhorn Slough/Moro Cojo/Salinas River	Elkhorn Slough SMCA	SMCA, SMR	1390	36.814	-121.759	Embayment/Bay	Central Coast
Elkhorn Slough/Moro Cojo/Salinas River	Elkhorn Slough SMR	SMCA, SMR	1390	36.814	-121.759	Embayment/Bay	Central Coast
Elkhorn Slough/Moro Cojo/Salinas River	Moro Cojo Slough SMR	SMCA, SMR	1390	36.814	-121.759	Embayment/Bay	Central Coast
Carmel River Estuary	Reference	NA	37	36.537	-121.923	Lagoonal Estuary	Central Coast

Morro Bay Estuary	Morro Bay SMR	SMR, SMRMA	1026	35.340	-120.847	Embayment/Bay	Central Coast
Morro Bay Estuary	Morro Bay SMRMA	SMR, SMRMA	1026	35.340	-120.847	Embayment/Bay	Central Coast
Goleta Slough	Goleta Slough SMCA (No-Take)	SMCA (No-Take)	97	34.419	-119.845	Lagoon Estuary	South Coast
Carpenteria Salt Marsh	Reference	NA	85	34.401	-119.536	Embayment/Bay	South Coast
Mugu Lagoon	Reference	NA	937	34.101	-119.100	Riverine Estuary	South Coast
Los Angeles Harbor	Reference	NA	1332	33.712	-118.248	Embayment/Bay	South Coast
Muted Bolsa Bay	Bolsa Bay SMCA	SMCA	80	33.697	-118.047	Embayment/Bay	South Coast
Bolsa Chica-Fully Tidal	Bolsa Chica Basin SMCA (No-Take)	SMCA (No-Take)	171	33.697	-118.038	Embayment/Bay	South Coast
Newport Bay	Upper Newport Bay SMCA	SMCA	671	33.604	-117.898	Embayment/Bay	South Coast
Agua Hedionda	Reference	NA	152	33.141	-117.325	Embayment/Bay	South Coast
Batiquitos Lagoon	Batiquitos Lagoon SMCA (No-Take)	SMCA (No-Take)	224	33.089	-117.291	Embayment/Bay	South Coast
San Elijo Lagoon	San Elijo Lagoon SMCA (No-Take)	SMCA (No-Take)	215	33.008	-117.271	Embayment/Bay	South Coast
San Dieguito Lagoon	San Dieguito Lagoon SMCA	SMCA	75	32.970	-117.261	Embayment/Bay	South Coast
Mission Bay/Famosa Slough	Famosa Slough SMCA (No-Take)	SMCA (No-Take)	880	32.768	-117.229	Embayment/Bay	South Coast
San Diego Bay	Reference	NA	5026	32.667	-117.151	Embayment/Bay	South Coast
Tijuana River estuary	Reference	NA	354	32.555	-117.118	Riverine Estuary	South Coast



**Table 2.** Representation of target monitoring metrics distributed across the four regions.

Target Metrics	Type	Key Attribute	South Coast	Central Coast	North Central Coast	North Coast	Total
Black seaperch density & size structure	Feature Assessment	Trophic Structure: Resident fishes	0	1	0	0	1
Diamond turbot density & size structure	Feature Assessment	Trophic Structure: Resident fishes	0	1	0	0	1
Pile surfperch density & size structure	Feature Assessment	Trophic Structure: Resident fishes	0	1	0	0	1
Pickleweed areal extent	Assesment Add-on	Biogenic Habitat	0	0	1	0	1
Fat innkeeper worm	Feature Assessment	Trophic Structure: Infaunal Assemblage	0	1	1	0	2
Anas spp.	North Coast metric	Dabbling Ducks	0	0	0	1	1
Anthya spp.	North Coast metric	Diving Ducks	0	0	0	1	1
Black Brandt	North Coast metric	Black Brandt	0	0	0	1	1
Western Gull	North Coast metric	Western Gull	0	0	0	1	1
Scolopacidae	North Coast metric	Shorebirds	0	0	0	1	1
Acipenser spp.	North Coast metric	Sturgeon	0	0	0	1	1
Oncorhynchus spp.	North Coast metric	Salmonids	0	0	0	1	1
Pleuronectidae	North Coast metric	Pleuronectidae	0	0	0	1	1
Urechis caupo	North Coast metric	Fat Innkeeper Worm	0	0	0	1	1
Cancer magister	North Coast metric	Dungeness Crab	0	0	0	1	1
Harbor porpoise	North Coast metric	Harbor porpoise	0	0	0	1	1
Pinnipedia	North Coast metric	Pinnipedia	0	0	0	1	1
Surfperch abundance & size frequency	Feature Checkup/Vital Sign	NA	0	1	0	1	2
Eelgrass density & % cover	Feature Assessment	Biogenic Habitat: Plants	0	1	0	1	2
Starry flounder abundance & size frequency	Feature Checkup/Vital Sign	NA	0	0	1	1	2
Bat ray abundance	Feature Assessment	Trophic Structure: Predatory fishes	0	0	1	1	2
Eelgrass shoot density	Assesment Add-on	Biogenic Habitat	0	0	1	1	2
Starry flounder abundance & size frequency	Assesment Add-on	Diversity	0	0	1	1	2
CA halibut abundance & size frequency	Assesment Add-on	Diversity	0	0	1	1	2
Shiner perch density & size	Feature Assessment	Trophic Structure: Resident	0	1	1	1	3

structure		fishes					
Striped seaperch density & size structure	Feature Assessment	Trophic Structure: Resident fishes	0	1	1	1	3
Marine mammal density	Feature Assessment	Habitat Provisioning: marine mammals	0	1	1	1	3
Native oyster bed areal extent/abundance	Assesment Add-on	Biogenic Habitat	0	1	1	1	3
Ulva areal extent	Assesment Add-on	Biogenic Habitat	0	1	1	1	3
Croaker abundance & size frequency	Feature Checkup/Vital Sign	NA	1	0	0	0	1
Pickleweed areal extent	Feature Assessment	Biogenic Habitat: Plants	1	0	0	0	1
Washington clam abundance	Feature Assessment	Trophic Structure: Infaunal Assemblage	1	0	0	0	1
Spotted sand bass density & size structure	Feature Assessment	Trophic Structure: Resident fishes	1	0	0	0	1
Croaker density & size structure	Feature Assessment	Trophic Structure: Resident fishes	1	0	0	0	1
Parasite diversity	Assesment Add-on	Trophic Structure	1	0	0	0	1
Topsmelt density & size structure	Feature Assessment	Trophic Structure: Resident fishes	1	1	0	0	2
Spp richness (inverts and fishes)	Assesment Add-on	Diversity	1	0	1	0	2
Spp diversity (invert and fish functional groups)	Assesment Add-on	Diversity	1	0	1	0	2
CA halibut abundance & size frequency	Feature Checkup/Vital Sign	NA	1	0	0	1	2
Arthropod biomass	Feature Checkup/Vital Sign	NA	1	0	0	1	2
CA halibut density & size structure	Feature Assessment	Trophic Structure: Predatory fishes	1	0	0	1	2
Gobies density & size structure	Feature Assessment	Trophic Structure: Resident fishes	1	0	0	1	2
Arthropod biomass	Feature Assessment	Productivity	1	0	0	1	2
Abundance & foraging rates of shorebirds	Assesment Add-on	Trophic Structure: Infaunal Assemblage	1	0	0	1	2
Piscivorous bird richness & abundance	Feature Assessment	Trophic Structure: Predatory birds	1	1	0	1	3
Shorebird richness & abundance	Feature Assessment	Trophic Structure: Predatory birds	1	1	0	1	3
Common littleneck clam abundance	Feature Assessment	Trophic Structure: Infaunal Assemblage	1	0	1	1	3
Leopard shark density & size	Feature Assessment	Trophic Structure: Predatory	1	0	1	1	3

structure/abundance		fishes					
pH/Carbonate chemistry	COST/OPC	NA	1	1	1	1	4
DO	COST/OPC	NA	1	1	1	1	4
Eelgrass aerial extent	Feature Checkup/Vital Sign	NA	1	1	1	1	4
Ghost and mud shrimp abundance	Feature Checkup/Vital Sign	NA	1	1	1	1	4
Clam abundance and size frequency	Feature Checkup/Vital Sign	NA	1	1	1	1	4
Marine bird richness & abundance	Feature Checkup/Vital Sign	NA	1	1	1	1	4
Marine Mammal/Pinniped abundance	Feature Checkup/Vital Sign	NA	1	1	1	1	4
Eelgrass aerial extent	Feature Assessment	Biogenic Habitat: Plants	1	1	1	1	4
Mud shrimp abundance	Feature Assessment	Trophic Structure: Infaunal Assemblage	1	1	1	1	4
Ghost shrimp abundance	Feature Assessment	Trophic Structure: Infaunal Assemblage	1	1	1	1	4
Pacific gaper clam abundance	Feature Assessment	Trophic Structure: Infaunal Assemblage	1	1	1	1	4

## APPENDIX 2: FORM LETTERS

### Initial Request for information on long-term monitoring:

Dear Colleague,

I am working on a project with California Ocean Science Trust, the Ocean Protection Council, and the California Department of Fish and Wildlife to develop an inventory of monitoring programs in estuaries throughout California to inform monitoring goals as established by the MPA program. The goal of the project is to see who is doing what across the CA estuaries (especially MPAs), and to determine what key MPA metrics are being monitored and what is missing.

You are being contacted because we have determined that you have been monitoring estuaries in California. Although we are aware of your monitoring efforts, we are asking for your help in giving us more specific details on your projects. We are only concerned with projects that will monitor estuaries for the next 5 years or longer. So if your plan is to only sample a given estuary for 4 years or less then you can just respond as “My project is not long-term”.

However, if your project is expected to be long-term we are looking for the following target metrics as outlined in each MPA region:

<i>Acipenser</i> spp.	Marine mammal density
<i>Anas</i> spp.	Native oyster bed areal extent/abundance
<i>Anthya</i> spp.	<i>Oncorhynchus</i> spp.
Arthropod biomass	Pacific gaper clam abundance
Arthropod biomass	Parasite diversity
Bat ray abundance	pH/Carbonate chemistry
Black Brant	Pickleweed areal extent
Black seaperch density & size structure	Pile surfperch density & size structure
CA halibut abundance & size frequency	Piscivorous bird richness & abundance
Cancer magister density	Pleuronectidae
Clam abundance and size frequency	Scolopacidae
Common littleneck clam abundance	Shorebird richness & abundance
Croaker abundance & size frequency	Spotted sand bass density & size structure
Diamond turbot density & size structure	Spp diversity (invert and fish functional groups)
DO (dissolved oxygen)	Spp richness (inverts and fishes)
Eelgrass areal extent	Starry flounder abundance & size frequency
Eelgrass density & % cover	Surfperch abundance & size frequency (any spp.)
Fat innkeeper worm	Topsmelt density & size structure
Ghost and/or mud shrimp abundance	<i>Ulva</i> areal extent
Gobies density & size structure	<i>Urechis caupo</i>
Harbor porpoise	Washington clam abundance
Leopard shark density & size structure/abundance	Western Gull
Marine bird richness & abundance	

Please let me know if you are planning on monitoring any of these metrics over the next five years in California estuaries. If you can please let me know the following for each metric you are monitoring:

1. The target metric.
2. The estuary where you are sampling each target metric.

This project aims to identify who, what, and where is being monitored in CA estuaries, and allow us to assess where monitoring gaps occur. All of which is a first step in establishing rigorous monitoring programs in CA estuaries (both MPA and non-MPA).

I look forward to any input you might be able to provide. Please forward on to anyone who might be interested. We are hoping to collect all responses by March 17, 2017.

Kind regards,

Brent Hughes  
bbhughes@ucsc.edu

#### Follow-up Request for long-term monitoring information:

Dear Colleague,

A few weeks ago I contacted you requesting details of your monitoring programs in California estuaries. I am hoping that you could spare a few moments to respond to the request, and give us some brief details about your monitoring program.

#### **Purpose:**

The California Ocean Science Trust, the Ocean Protection Council, and the California Department of Fish and Wildlife are developing an inventory of monitoring programs in estuaries throughout California to inform monitoring goals as established by the MPA program. The goal of the project is to see who is doing what across the CA estuaries (especially MPAs), and to determine what key MPA metrics are being monitored and what is missing.

#### **Details:**

We are only concerned with projects that will monitor estuaries for the next 5 years or longer. So if your plan is to only sample a given estuary for 4 years or less then you can just respond as "My project is not long-term".

However, if your project is expected to be long-term we are looking for the following target metrics as outlined in each MPA region:

<i>Acipenser</i> spp.	Marine mammal density
<i>Anas</i> spp.	Native oyster bed areal extent/abundance
<i>Anthya</i> spp.	<i>Oncorhynchus</i> spp.
Arthropod biomass	Pacific gaper clam abundance
Arthropod biomass	Parasite diversity

Bat ray abundance	pH/Carbonate chemistry
Black Brandt	Pickleweed areal extent
Black seaperch density & size structure	Pile surfperch density & size structure
CA halibut abundance & size frequency	Piscivorous bird richness & abundance
Cancer magister density	Pleuronectidae
Clam abundance and size frequency	Scolopacidae
Common littleneck clam abundance	Shorebird richness & abundance
Croaker abundance & size frequency	Spotted sand bass density & size structure
Diamond turbot density & size structure	Spp diversity (invert and fish functional groups)
DO (dissolved oxygen)	Spp richness (inverts and fishes)
Eelgrass areal extent	Starry flounder abundance & size frequency
Eelgrass density & % cover	Surfperch abundance & size frequency (any spp.)
Fat innkeeper worm	Topsmelt density & size structure
Ghost and/or mud shrimp abundance	<i>Ulva</i> areal extent
Gobies density & size structure	<i>Urechis caupo</i>
Harbor porpoise	Washington clam abundance
Leopard shark density & size structure/abundance	Western Gull
Marine bird richness & abundance	

Please let me know if you are planning on monitoring any of these metrics over the next five years in California estuaries. If you can please let me know the following for each metric you are monitoring:

1. The target metric.
2. The estuary where you are sampling each target metric.

This project aims to identify who, what, and where is being monitored in CA estuaries, and allow us to assess where monitoring gaps occur. All of which is a first step in establishing rigorous monitoring programs in CA estuaries (both MPA and non-MPA).

I look forward to any input you might be able to provide. We are hoping to collect all responses by March 31, 2017.

Kind regards,

Brent Hughes  
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Appendix D:

**RECOMMENDATIONS  
FOR HUMAN USES  
MONITORING**



## RECOMMENDATIONS FOR THE LONG-TERM MONITORING OF HUMAN USES IN THE CONTEXT OF CALIFORNIA'S MPA NETWORK

**Authors: Dr. Cheryl Chen; Dr. Noah Enelow; Jon Bonkoski; Dr. Laurie Richmond**

### 1. INTRODUCTION

This report is the second of two deliverables that describe and recommend a socioeconomic monitoring program for California's Marine Protected Area Network. Under the California Marine Life Management Act (MLMA), state managed fisheries are required to implement ecosystem-based and adaptive management measures to ensure the ecological and economic sustainability of ocean resources into the future. However, to effectively design and implement these management regimes requires leveraging existing data collection efforts and developing cost-effective and innovative approaches to fill data gaps and address programmatic data collection limitations. Having the necessary robust, fine-scale, and spatially explicit socioeconomic human use data will better enable marine resource managers to design, monitor, and adapt the targeted management measures needed to effectively reach sustainability goals.

A significant amount of fisheries and human use data has been collected by state agencies and researchers over the years yet overall the state's marine protected areas still lack the robust ongoing streams of data needed to inform ecosystem-based and adaptive management approaches. This patchwork of information leads to an unclear understanding of the historical, current, and potential future status of marine resources that is necessary to prioritize and develop effective management plans.

Given this, the California Ocean Protection Council (OPC) is seeking to understand how best to design a socioeconomic monitoring program to assess the impact of recently established marine protected areas (MPAs). The overall goal of this project is to develop a set of well-supported recommendations of methods and metrics that could be used in the long-term socioeconomic monitoring of California's MPAs. These recommendations will lay the groundwork for a rigorous performance measurement system for identifying and tracking the effects of the MPA network on key sectors of the coastal economy: commercial and recreational fishing and coastal recreation. The outputs from this project are a suite of recommended indicators and metrics, and an associated design for monitoring the socioeconomic dimensions of MPAs.

This project has two objectives. The first is to develop a comprehensive list of relevant data sources, including data the state can use to determine MPA effects and identify where there are current data gaps (see Deliverable 1). The second objective is to provide design recommendations for a socioeconomic monitoring program that fills the identified data gaps and proposes mechanisms for obtaining new data along with available data streams. To accomplish these objectives, we have split the tasks into two deliverables. This second deliverable includes this report organized into three monitoring tiers under which is the recommended monitoring metrics for each sector: commercial fishing, Commercial Passenger Fishing Vessels (CPFV), recreational fishing, and coastal recreation. In addition, we have developed an organized list of key metrics and monitoring tier (provided in an excel workbook) as another format for understanding the monitoring tiers.

#### **1.1. Overarching Approach to Monitoring Human Uses in the Context of MPA Monitoring**

It is important to recognize the differences between the monitoring of biological resources and monitoring of human uses in order to inform how overarching approaches to MPA monitoring should be framed and designed.

The monitoring of human use data can be thought of as composing of two major components. Spatially explicit data and overall population wide trends. Due to the inherent spatial nature of MPAs - human use monitoring data must be spatially referenced in order to determine the location of activities and monitor how the location and the intensity of those activities change over time. However, these changes in the spatial patterns of use must be contextualized within larger overall population wide trends in order to have a more complete understanding of the drivers behinds observed changes and trends at the site level. Thus, it is critical to capture both spatially explicit and overall population wide trends in order to comprehensively monitor California's MPA network. Our recommendations in this report focus on presenting key metrics to monitor across both these two major components.

Additionally, the biological monitoring of MPAs is often framed as monitoring specific sites inside and outside MPAs in order to determine an MPA effect. However, particularly for consumptive human uses, this at times is not a useful framing as often consumptive human uses are not allowed within MPAs. Thus, in order to monitor and evaluate an 'MPA effect', the monitoring of consumptive human uses largely focuses on understanding how MPAs may be impacting the overall socioeconomic status and health of consumptive user populations as well as how consumptive activities may be impacting areas outside of designated MPAs. Thus, several of the recommendations within this report focus on gathering census or population wide data (including spatially explicit data) as opposed to just focusing on specific sites in order to understand the larger socioeconomic impacts of MPAs.

## **2. OVERARCHING RECOMMENDATIONS**

The following is a set of overall recommendations that apply more broadly to developing a socioeconomic monitoring system.

### **2.1. Engaging Tribes in MPA Monitoring and Evaluation**

This report does not include specific recommendations for including tribal entities in the socioeconomic monitoring program. However, Native American Tribes in California have a distinct political status as well as unique historical and cultural connections to and uses of marine resources affected by MPA management. In her analysis of the involvement of Native people in the planning for MPAs in Washington and British Columbia, Singleton (2009), describes how these planning processes mistakenly assumed Native groups were equivalent to other kinds of stakeholders invested in MPA outcomes. She describes how Tribes have significant differences in terms of legal rights, political capacity, and historical and cultural connections to resources when compared to other stakeholder groups and, as such, should be treated differently. Additionally, there are several California (SB 18, 2004; AB 52, 2004) and Federal policies (EO 13175) that require agencies to consult with and consider potential impacts to Tribes and traditional tribal cultural places in any actions that attempt. Finally, the state of California recognized the unique legal status of Tribes in relation to the MLPA initiative by establishing a government-to-government consultation process with affected Tribes and the inclusion of protections for Tribal harvest in the MPA regulations. Given these factors, we are not including specific monitoring methodologies for California's Tribal communities. However, we recommend that special attention be paid to developing a Tribal component of any long-term socioeconomic monitoring program for California's MPAs; and that the Tribal governments are directly included in the design and implementation of a monitoring system.

### **2.2. Data Accessibility and Visualization**

A robust socioeconomic monitoring effort is often a collaboration between state agencies, NGOs, and academic researchers. Analysis of the data collected across monitoring programs will be key in developing a robust and comprehensive understanding of the socioeconomic status of human uses as it relates to

California MPAs. Thus, central to engaging partners in the monitoring effort would be to devise better tools for making monitoring data accessible to partners in a format that also protects confidentiality requirements.

Digital data visualization and query tools can be a very effective means for making data accessible to interested parties. The fisheries data explorer on OceanSpaces (<http://oceanspaces.org/fisheries-data-explorer>) is an example of a data viewer that could be updated and added to in order to support the monitoring effort. The ocean spaces data explorer contains data from commercial and CPFV fisheries, but recreational and other human use data gathered through the monitoring effort could be added to a similar type of viewer. Additionally, the underlying data in the data explorer is available for download allowing for research to integrate these datasets into their own datasets for integrated analyses. Working with a programming team, it may also be possible to develop tools that develop and publish annual “snap-shot” summaries of socioeconomic datasets related to MPA monitoring each year. This would help to both elevate the profile on the socioeconomic dimensions of MPAs but also build a community of socioeconomic researchers that could collaborate on advancing research in this area into the long term.

### **2.3. The Role of Technology in MPA Monitoring**

In this digital age, there is a large role technology can play in cost-effectively implementing and scaling data collection efforts on human uses of coastal and ocean areas. Technology can serve a multitude of uses in human use data collection.

One simple way of utilizing technology is to develop robust spatially explicit online surveys. For example, annual surveys to fishermen or coastal recreation users can be developed as web-based surveys which are cost effective and easily replicable over time. These web-based surveys may be developed to have spatial mapping components in order to capture data and associate those data with spatial use patterns—creating a powerful tool for MPA monitoring and evaluation. Because MPAs by their nature are spatial, any data gathered to monitor MPAs must be spatially explicit as well.

A more advanced and systemic use of technology is the use of mobile digital data collection technology in fisheries data collection. Fisheries across the globe are piloting digital logbooks or digital data collection applications using GPS enabled mobile phones or tablet devices.

Through these mobile data collection applications, spatial fishing data can automatically be captured using a mobile phone or tablet's GPS unit and associated fishing trip characteristics and economic information may also be digitally captured. These data may then be uploaded to a data server via a cellular data connection after each fishing trip—making data available in near real-time to fisheries managers and fishermen themselves. This type of technology would enable fisheries managers to closely and actively monitor and manage fisheries performance and effectively implement adaptive management approaches.

In California, digital fisheries data collection technology would benefit both long-term MPA monitoring as well as fisheries management. Both initiatives require cost-effective technology solutions that tighten the feedback loop between data collection and data analysis needed to support adaptive management measures. Together this would better enable innovative management approaches to be piloted, tested, and refined to advance the way we manage fisheries so that management costs are lowered, fish stocks are sustainable, and economic benefits to fishing communities are maximized.

Modernizing fisheries data collection programs will not only streamline data collection and delivery but also allow MPA and fishery managers to quickly update data collection forms to respond to changing information needs and emerging uses. Digital data collection allows for the flexibility needed to develop, test, and refine fisheries data collection programs that can be integrated across fishing sectors as well as

with biological and ecological data. This ability to quickly and iteratively adapt data collection programs will be key to developing the robust socioeconomic fisheries data needed to explore bio-economic linkages and dynamics that are foundational to ecosystem-based and adaptive management approaches.

Furthermore, socioeconomic monitoring is aided by collaboration with a number of government, academic, and community partners. Working with partners in monitoring can be eased through the development of digital tools for displaying and sharing socioeconomic datasets such as the OceanSpaces web platform. Investment in digital tools to make fisheries and socioeconomic data accessible in a way that continues to protect data confidentiality requirements will greatly enhance monitoring efforts.

Indeed, integrating technology into human use data collection program will be key to ensuring the long-term robustness and viability of any MPA monitoring program.

### 3. HUMAN USE MPA MONITORING PROGRAM RECOMMENDATIONS

In the following sections we provide our recommendations for key metrics and data collection methods for long-term MPA monitoring and evaluation. Our recommendations are presented in three tiers. The tiers are additive as they build upon one another. The first tier includes essential metrics, the second tier includes all of the Tier 1 metrics while also adding metrics and so on for the third tier. We then recommend specific data collection methodology in each tier. The idea behind presenting a tiered approach is to offer monitoring program scenarios based on the extent of funding and resources available.

In each tier we create sections for each sector: commercial fisheries, CPFV fisheries, recreational fisheries, and coastal recreation and tourism. Within each of these sections we organize our recommendation around data collection methodologies/opportunities. We do this as the data collection methodology/opportunity is the principle design element - it centers this report around the specific opportunities we have to collect data. We organize the report in this way as there already exists a landscape of MPA data collection efforts/opportunities and we want to be explicit about how each could be maximized as well as how new efforts could be developed to fill existing gaps. Indeed, we place emphasis on 'how' metrics should be gathered as it is what can vary and determine the robustness and usefulness of the data collected. We also discuss 'why' certain metrics should be gathered such as it provides a core metric, enables analysis to calculate a core metric, or enables cross comparison across human use sectors.

Specifically, in Tier 1 we focus on presenting the metric that are core or of highest priority to gather and the methods to gather those metrics. We indicate what metrics are already being gathered in existing data collection programs and what are new metrics that should be gathered. In Tier 2, we focus on the identifying secondary priority metrics to be gathered as well as expansions/improvement of methods to gather those metrics. Lastly, in Tier 3, we focus on how integrating technology into data collection programs could be utilized and address stuck points and weaknesses in current data collection efforts and overall streamline socioeconomic data collection efforts.

#### **3.1. TIER 1**

##### **3.1.1. Commercial Fisheries**

###### ***Annual License Renewal & Vessel Registration***

Annual license and vessel registration renewal is an excellent opportunity to gather basic information from commercial fishermen. When purchasing or renewing a license, the California Department of Fish and Wildlife (CDFW) can require fishermen to provide information in order to receive their license or vessel

registration. It is a touch point with fishermen that CDFW should maximize that could serve as a springboard to additional survey efforts to gather census data on commercial fishermen.

Below we provide the metrics that should be gathered using this method and state the rationale for why each metric should be gathered:

- Contact Information (phone, email, home address)
  - Having contact information (especially email) from commercial fishermen will provide the foundation in which a multitude of data collection efforts can be built upon. To collect data, you must be able to contact your study population. This has been a key challenge in current data collection efforts.
- Demographics (Age, gender, ethnicity, household income level, education level, years of experience commercial fishing overall, years of experience commercial fishing in a specific fishery)
  - Understanding the demographic profile of California commercial fishermen will allow researchers to better understand how the impacts of MPAs or fisheries management unfolds unevenly across the population. Furthermore, gathering demographic data over time will help to understand changes and trends in the composition of California's commercial fishing fleet.
  - Population attribute data is key in developing sample designs when it is not feasible to survey the entire commercial fishing population. This will help ensure sampling efforts are representative of the larger population.
  - For the metric of years of experience commercial fishing in a specific fishery, this can be gathered when purchasing fishery specific licenses/permits.
- Vessel/Fisherman Homeport
  - This is not currently gathered by the CDFW but is an important metric for economic analyses. A fisherman's homeport may differ than the port they make landings in and a homeport can be used to determine where - or, in other words, in what regional economy - a fisherman's revenue might be spent.

### ***Landing Receipts***

The CDFW requirement to capture data on all commercial landings provides critical census data on harvest amount, revenue, and harvest location. This data is captured at the individual species and landing port level which makes it then possible to summarize to a regional and state level as well as cross-species level (such as the nearshore finfish fishery). This data collection method should continue; however, modifications should be made. That information and the rationale for why each metric should be gathered are recommended below:

- Number of fishermen making landings
  - This is a key metric to understand the overall harvest participation rate in each port and fishery. By capturing the L number or license number of each fishery at landing a backend analyses can then be conducted to determine the number of unique fishermen making landings in a given port/fishery in a given period of time. This is currently already being gathered in landing receipts.
- Landings (lbs.), catch price, and revenue (\$) by species
  - These are key metrics to understanding the overall harvest amount and associated gross revenue being derived from the harvest of marine resources. By capturing the pounds and price paid per pound you can then calculate gross revenue. This is currently already being gathered in landing receipts.



- Gear utilized
  - This is a key metric as the gear a fisherman utilizes can differ from other fishers and at times a certain fishery-gear combination may be managed as a separate fishery. The type of gear utilized helps researchers and managers understand how and at what scale (e.g. trawl vs hook and line) marine resources are being harvested. This is currently already being gathered in landing receipts.
- Landing port location
  - This is a key metric to understand where marine resources are being harvested. Being able to tie fishery landings to a port location enable us to understand the fishery dependencies of a port community and the profile of fishermen that make up a port community. This is currently already being gathered in landing receipts.
- Catch per unit effort (CPUE)
  - This is a key metric to determine how the amount of effort it takes fishermen to harvest marine resources may be changing over time. Gathering data on fishery landings alone does not tell us how much more/less effort (which equate to both time and expenses) fishermen may be expending to harvest the same amount of marine resources. This metric should be gathered as the number of days fishing that was expended to make a landing.
  - For some fisheries additional effort data could be captured such as the number of traps a fisherman utilized on their trip in order to achieve a more granular understanding of how the differences in effort across fishermen. This data could potentially be captured in fishery logbook data.
  - Capturing the number of days fishing will also allow CPUE to then be compared to CPFV and recreational fishing CPUE data which is also measured through number of fishing days.
  - The number of days fishing nor the number of traps utilized is not currently captured in landing receipts
- Harvest location
  - This key metric is critical as it allows other metrics (e.g. pounds landed, revenue, fishing effort) to be attributed to a spatial location and underpins the evaluation of where fishing occurs in relation to MPAs.
  - Currently in landing receipts this is gathered as a single 10 x 10 nm block and it is unclear if fishermen or fish buyers fill this information out. It is recommended that the landing receipt form allow for multiple 10x10nm blocks be recorded if fishing occurred in more than one block.
  - For some fisheries logbooks are utilized that may provide higher resolution harvest locations. We recommend landing receipts to also capture the associated logbook record number so that these records can be cross referenced
  - Overall current methods for capturing harvest location are self-reported. Given the vital nature of this data it is important to make improvements to the reliability and validity to this data which we will address in Tier 2 and 3.

### ***Commercial Fishery Specific Logbook Data***

As detailed in our previous report assessing current socioeconomic MPA monitoring data streams--there exists specific commercial fishing logbooks in several fisheries. Our overall recommendations for these logbooks are to:

- Ensure uniformity across logbooks. The capture of harvest location should be standardized to GPS location whenever possible
- Ensure logbooks data are tied to landing receipt data. There is currently no feasible way to connect logbook data to landing receipt data. All logbook data records should reference specific landing receipt record numbers in order to be able to cross reference and enable analyses at a more granular level that gathering fishery specific logbook data allows. For example, being able to link these two

data records together will allow landings data (e.g. pounds landed) to be tied to more specific harvest location and effort data.

In general logbook data should focus on gathering these core metrics:

- Harvest location
  - Whenever possible gather harvest location by indicating GPS location to enable the capture of high resolution spatial data
- Effort
  - This should be captured in gear specific metrics. For example, in trap fisheries this should be the number of traps utilized, in dive fisheries this is amount of dive time, in other fisheries this could be the number of hooks utilized, etc.
  - Our recommendation is to capture the amount of fishing days in landings receipt data.
- Estimates in catch
  - This most likely can only be an estimate as there may not be way to weigh the catch on each vessel. However, it is important to estimate catch for each fishing event so that harvest amounts can be attributed to a specific harvest location.

### *Annual and Semi-Annual Surveys*

An annual in-depth survey of commercial fishermen can provide additional information necessary to fully understand the socio-economic health of commercial fisheries. Specifically, surveys can be conducted where more in-depth information needs to be gathered that cannot be captured quickly (e.g. during license renewal) or needs to be captured at an annual or semi-annual time scale.

Gathering operating costs is a prime example of where an annual or semi-annual survey is necessary. Commercial fishing expenditures occur both on a per-trip basis but also on an annual basis (e.g. insurance, boat slip fee, maintenance, etc.). An annual survey will allow fishermen to summarize their expenses across an entire year for their commercial fishing operations.

There are a few key pieces of information that are vital to effectively design and implement a statistically sound survey effort:

- Your study population - this is a listing of all commercial fishermen
- Contact information - this is your study population's contact information in order to send them a survey. Ideally this contact information is captured during commercial license purchase/renewal
- Characterizing your study population - this is demographic and fishery level economic (landings/revenue) information. Being able to characterize your study population will enable you to determine if your survey sample is statistically representative of the larger population based on the attributes you deem important (e.g. fishery revenue bracket, homeport, age, household income, etc.). Knowing this information will also allow you to develop sample weights that can be utilized to extrapolate the survey data to the larger population.

It is recommended that for an annual survey (could be every 2 years if resources are not available to conduct each year) that the survey be sent to all commercial fishermen. Fishermen could be contacted via phone, email, or physical mail -- all directing them to a web-based survey. The CDFW cannot require these surveys to be taken, however, efforts should be made to incentivize response rate such as entry into a series of prizes/giveaway (perhaps donated) or discounts on license fees, etc.

Below we provide the metrics that should be gathered using this method and the rationale for each key metric:

- Operating costs



- This is a vital key metric that is needed to monitor the economic health of commercial fishermen. Gather gross-revenue data at time of landing is not enough to determine the economic health of commercial fishermen as understanding changes in operations cost help us understand both the amount of revenue fishermen are able to take home themselves as well as they are expending in the larger economy.
- Operating costs should be captured to understand what expenses fishermen incur, where those expenses are spent, and how these change over time
- Number of crew members employed (part time vs. full time)
  - This metric is important to gather in order to determine the employee force that commercial fisheries support

It is important to mention that obtaining adequate representative participation and a time series of these data are vital in order to properly evaluate these data and make any statements that could be understood as representative of the entire commercial fishing fleet or adequate at measuring change over time.

### 3.1.2. CPFV Fisheries

#### *Annual License Renewal & Vessel Registration*

Annual license and vessel registration renewal is an excellent opportunity to gather basic information from CPFV operators. When purchasing or renewing a license, the California Department of Fish and Wildlife (CDFW) can require fishermen to provide information in order to receive their license or vessel registration. It is a touch point with fishermen that CDFW should maximize that could serve as a springboard to additional survey efforts to gather census data on CPFV operators.

Below we provide the metrics that should be gathered using this method and state the rationale for why each metric should be gathered:

- Contact Information (phone, email, home address)
  - Having contact information (especially email) from CPFV operators will provide the foundation in which a multitude of data collection efforts can be built upon. To collect data, you must be able to contact your study population. This has been a key challenge in current data collection efforts.
- Demographics (Age, gender, ethnicity, household income level, education level, years of experience operating CPFV overall, years of experience operating in a specific fishery)
  - Understanding the demographic profile of California CPFV operators will allow researchers to better understand how the impacts of MPAs or fisheries management unfolds unevenly across the population. Furthermore, gathering demographic data over time will help to understand changes and trends in the composition of California's CPFV fleet.
  - Population attribute data is key in developing sample designs when it is not feasible to survey the entire commercial fishing population. This will help ensure sampling efforts are representative of the larger population.

#### *CPFV Logbooks*

CPFV logbooks are currently the primary method in which managers and researchers are able to collect data from the CPFV fleet. These logbooks are a vital mechanism in which to capture granular trip level data from CPFV operators and should be maximized to gather key metrics necessary long-term monitoring data.

Below we provide the metrics that should be gathered using this method and state the rationale for why each metric should be gathered

- Port of departure and return

- This is a key metric as this allows trip data and thus socioeconomic changes and dependencies to be associated with a specific port community. This is currently being gathered in CPFV logbooks.
- Number of anglers
  - This is a key metric as it measures the amount of effort being expended in the fishery. This is currently being gathered in CPFV logbooks.
- Trip target species/fishery
  - This is a key metric as it is important to know what the primary target of CPFV trips are in order to properly associate the economic revenue of the trip to a specific fishery. It is important to note that the trip type does not always coincide with what is caught during the trip though and at time may not be fishery specific (e.g. potluck trip). This is currently being gathered in CPFV logbooks.
- Trip length type
  - This is a key metric is it is important to understand the type of trips CPFV operators offer (e.g. ½ day, ¾ day, full day, multi day) and what type of trips are economic drivers in a given port community. This also provide a more granular understand of the amount of effort (in terms of time) that is being expended by CPFV anglers. Only single day or multi day trip type data is currently being gathered in CPFV logbooks.
- Fishing location
  - This key metric is critical as it allows trips data to be attributed to a spatial location and underpins the evaluation of where fishing occurs in relation to MPAs.
  - Currently harvest location is gathered as a single 10 x 10 nm block. CPFV logbooks should also allow for the entry of multiple 10 x 10 nm blocks.
  - The current methods for capturing harvest location is self-reported. Given the vital nature of this data it is important to make improvements to the reliability and validity to this data which we will address in Tier 2 and 3.
- Average price paid per angler
  - This is a key metric as currently there is no revenue information being captured for CPFV operators. Knowing the price paid per angler for a given trip will allow managers and researchers to extrapolate the gross revenue generated from a given trip. This will help us understand overall gross revenue, but also gross revenue derived from different fisheries. This is current not being gathered in CPFV logbooks.
- Number and pounds of fish caught by species
  - This is a key metric as it provides data on the amount of fish caught and harvested. Currently only the number of fish caught by species if being captured by CPFV logbooks which makes it difficult to compare to commercial fishing landing receipt data as they are recorded in pounds.
  - It is recommended that CPFV operators weigh each fish caught to determine the total pounds of fish caught by species and record the information in the CPFV logbooks.
- Number of crew on trip
  - This is a key metric in order to better understand the labor force that CPFV operations employ. This is not currently gathered in the CPFV logbooks.
- Number of fishing days during trip - Effort and CPUE
  - This is a key metric in order to better understand the amount of effort being expended by CPFV anglers. This is not current gathered in the CPFV logbooks and would enable managers and research to calculate effort in terms of angler-days and thus CPUE as well which would then be comparable to commercial and recreational fishing data.

### ***Annual & Bi-Annual Surveys***

An annual in-depth survey of CPFV operators can provide additional information necessary to fully understand the socio-economic health of the CPFV fleet. Specifically, surveys can be conducted where

more in-depth information needs to be gathered that cannot be captured quickly (e.g. during license renewal) or needs to be captured at an annual or semi-annual time scale.

Gathering operating costs is a prime example of where an annual or semi-annual survey is necessary. CPFV operation expenditures occur both on a per-trip basis but also on an annual basis (e.g. insurance, boat slip fee, maintenance, etc.). An annual survey will allow CPFV operators to summarize their expenses across an entire year.

There are a few key pieces of information that are vital to effectively design and implement a statistically sound survey effort:

- Your study population - this is a listing of all CPFV operators
- Contact information - this is your study population's contact information in order to send them a survey. Ideally this contact information is captured during CPFV license purchase/renewal
- Characterizing your study population - this is demographic and fishery level economic (landings/revenue) information. Being able to characterize your study population will enable you to determine if your survey sample is statistically representative of the larger population based on the attributes you deem important (e.g. revenue bracket, homeport, age, household income, etc.). Knowing this information will also allow you to develop sample weights that can be utilized to extrapolate the survey data to the larger population.

It is recommended that for an annual survey (could be every 2 years if resources are not available to conduct each year) that the survey be sent to all CPFV operators. Operators could be contacted via phone, email, or physical mail -- all directing them to a web-based survey. The CDFW cannot require these surveys to be taken, however, efforts should be made to incentivize response rate such as entry into a series of prizes/giveaway (perhaps donated) or discounts on license fees, etc.

Below we provide the metrics that should be gathered using this method and the rationale for each key metric:

- Gross-revenue
  - This is a vital key metric as currently no comprehensive revenue information is gathered on CPFV operations. Gathering data on CPFV revenue is critical to understanding the economic contribution of the CPFV fleet and the economic value CPFV operators are able to derive from marine resources.
- Operating costs
  - This is a vital key metric that is needed to monitor the economic health of commercial fishermen. Gather gross-revenue data at time of landing is not enough to determine the economic health of CPFV operators as understanding changes in operations cost help us understand both the amount of revenue fishermen are able to take home themselves as well as they are expending in the larger economy.
  - Operating costs should be captured to understand what expenses operators incur, where those expenses are spent, and how these change over time
- Number of crew members employed (part time vs. full time)
  - This metric is important to gather in order to determine the employee force that the CPFV fleet support

It is important to mention that obtaining adequate representative participation and a time series of these data are vital in order to properly evaluate these data and make any statements that could be understood as representative of the entire commercial fishing fleet or adequate at measuring change over time.

### 3.1.3. Recreational Fisheries

### ***License Purchase***

Recreational fishing license purchase is an excellent opportunity to gather basic information from recreational saltwater anglers. When purchasing a license, the California Department of Fish and Wildlife (CDFW) can require anglers to provide information in order to receive their license. It is a touch point with anglers that CDFW should maximize that could serve as a springboard to additional survey efforts to gather census data on commercial fishermen.

A key recommendation for CDFW is to record if license purchasers are saltwater or freshwater fishing or both. This is a key gap as it prevents managers and researchers to understand what portion of license purchasers are targeting marine resources in order to obtain a general sense of the population size of saltwater anglers and also target their MPA monitoring survey efforts based on our recommendations below.

Below we provide the metrics that should be gathered using this method and state the rationale for why each metric should be gathered:

- Contact Information (phone, email, home address)
  - Having contact information (especially email) from recreational anglers will provide the foundation in which a multitude of data collection efforts can be built upon. To collect data, you must be able to contact your study population. This has been a key challenge in current data collection efforts.
  - Furthermore, capturing home address or even home zip code will allow follow up survey efforts to stratify sample design by zip code which helps to ensure you achieve a representative sample

### ***California Recreational Fishing Survey (CRFS)***

The CRFS program collects data on four major modes of fishing: private/rental boats, commercial passenger fishing vessels (CPFVs), man-made structures (e.g., piers), and beaches/banks. Since we assessed available CPFV data in the previous section, in this section we focus upon private recreational fishing and thus only assess the private/rental boats, man-made structures, and beach/bank fishing modes.

The CRFS program conducts on-site surveys to gather catch and effort data and utilize telephone surveys to supplement the on-site collected data in order to extrapolate catch and effort estimates across under sampled fishing sites and times of day (e.g. night fishing). Sampling in the CRFS program generally occurs year-round for all modes and monthly estimates are produced. Catch and effort estimates are produced for each of the six geographic districts (described below) and for each fishing mode.

Given the vast size of California's saltwater recreational angler population the CRFS program is a relatively robust program to both gather data and extrapolate these data to evaluate the status of recreational fishing in California.

Below we provide the metrics that should and are gathered using this method and the rationale for each key metric:

- Catch amount
  - This can only feasibly be captured by number of fish caught but is a key metric as it determines the amount of marine resources harvested. Pounds harvested could be calculated on the backend using an average pound per fish statistic.
- Catch location
  - This key metric is critical as it allows trips data to be attributed to a spatial location and underpins the evaluation of where fishing occurs in relation to MPAs.
  - Currently harvest location is gathered as a single 1 x 1 nm block.

- Catch effort
  - This is a key metric in order to better understand the amount of effort being expended by recreational saltwater anglers. This enables managers and researchers to calculate effort in terms of angler-days and thus CPUE as well which would then be comparable to commercial and CPFV fishing data.

In spatial terms, CRFS data is summarized to large CRFS districts. However, for it to be more useful to long-term MPA monitoring--work needs to be done to explore and understand how spatial fishing location data could be extrapolated and visually displayed to represent spatial patterns of recreational fishing catch and effort. It may be possible to do so, but the data and methodology are not readily available or well understood. It may be that multipliers to take sample data and extrapolate to the specific geographic area of interest may need to be developed on a case-by-case basis. Thus, our Tier 1 recommendation is to engage the CRFS program to understand to what extent CRFS spatial data can be extrapolated to develop a representative spatial map of recreational fishing patterns.

### ***Fishery Specific Report Card Data***

CDFW has implemented a report card program for specific fisheries in order to capture more granular and complete data on specific prioritized fisheries. Currently, relevant to marine waters - there are recreational fishing report cards for the spiny lobster, abalone, and north coast salmon. In particular, the report card program is vital to capture data on the lobster and abalone fishery as the CRFS program only captures data on finfish species.

Key metrics that are currently gathered and should continue to be gathered are:

- Location of harvest - this is typically by location name
  - A key issue with recording harvest location by location name is this does not provide a spatially explicit location. For example, if someone indicated they harvested abalone from Fort Ross it's unclear what the spatial boundaries for Fort Ross are and is left up to the interpretation of the fisherman. A possible solution to this issue will be addressed in Tier 3.
- Effort expended - this is typically fishery specific such as recorded by dive time or days fishing
- Harvest amount - this is the amount harvested by count (vs. weight)

A key issue in fishery report card data is that they suffer from a lack of compliance in returning report cards back to the CDFW. Thus, in the past, extensive phone interviews have been conducted each year with a sample of abalone or lobster license holders to produce estimated catch statistics for the proportion of the license purchasers who did not return their report cards. These estimates are then used to extrapolate report card data statewide. It is important to continue these efforts to account for submitted and unsubmitted report cards in order to gather comprehensive data from recreational fishermen that are relatively small in size but have a high impact on high priority fisheries. A possible solution to this issue is addressed in Tier 3.

### ***Online Surveys***

An online survey of CPFV operators can provide additional information necessary to fully understand the economic contribution of the saltwater recreational fishing population. Specifically, surveys can be conducted where more in-depth information needs to be gathered that cannot be captured quickly (e.g. during license renewal) or needs to be captured at an annual time scale.

Gathering recreational fishing expenses is a prime example of where a semi-annual survey is necessary. Currently, no economic information is captured for recreational fisheries - leaving a large gap in understanding the economic contribution of saltwater recreational fishing compared to commercial and CPFV sectors. Gathering this type of information is beyond the scope and design of the CRFS program as recreational fishing expenditures occur both on a per-trip basis but also on an annual basis (e.g. boat



maintenance, gear purchase, etc.). A survey conducted every 2-3 years will allow managers and researchers to gain an understanding of the economic aspects of recreational fishing and how they may change over time.

There are a few key pieces of information that are vital to effectively design and implement a statistically sound survey effort:

- Your study population - this is a listing of recreational saltwater anglers
- Contact information - this is your study population's contact information in order to send them a survey. Ideally this contact information is captured during license purchase/renewal
- Characterizing your study population - this is demographic information. Being able to characterize your study population will enable you to determine if your survey sample is statistically representative of the larger population based on the attributes you deem important (e.g. location, age, household income, etc.). Knowing this information will also allow you to develop sample weights that can be utilized to extrapolate the survey data to the larger population. This information could be captured as part of this survey effort. In Tier 2 we also give recommendations of how this could be captured.

The survey can be conducted every 2-3 years depending on available resources and should be sent to a strategically designed sample of recreational anglers. Anglers could be contacted via phone, email, or physical mail -- all directing them to a web-based survey. Efforts should be made to incentivize response rate such as entry into a series of prizes/giveaway (perhaps donated) or discounts on license fees, etc.

Below we provide the metrics that should be gathered using this method and the rationale for each key metric:

- Annual saltwater recreational fishing expenses
  - This key metric is to understand the overall economic contribution of saltwater recreational fishing. This is captured using an annual time frame as recreational fishing expense may occur outside of a per trip basis such as boat maintenance or gear purchase.
- Days fishing last year by mode (private vessel, beach/bank, pier/jetty, etc.)
  - This key metric to capture the amount of fishing effort expended by recreational anglers.
- Last trip expenses
  - This key metric is to understand and capture the expenses of a representative recreational fishing trip. Asking about a specific trip will provide more granular details to trip expenses
- Last trip fishing location(s)
  - This key metric is vital in order to attribute economic information to a specific fishing location and capture more granular details on fishing location that are not captured through other data collection methods listed in this section.

### 3.1.4. Coastal Recreation and Tourism

#### *Online Surveys*

Online surveys are an essential tool for data collection to understand the socioeconomic impact of MPAs. Online surveys can provide statistically valid, demographically weighted random samples of resident populations to understand frequency of recreational visitation, activities of choice, and trip expenditures by category. A well-designed online survey can provide MPA managers and researchers with data on who engages in coastal recreation activity, what activities they engage in, and how much they spend on locally provided goods and services during recreational visits.

From a statewide representative sample, analysts can generate high-level robust summary statistics aggregated to the state level, including: statewide coastal recreation participation rates; statewide spatial

distributions of coastal visits; robust estimates of spatial distributions of coastal recreational activities; demographic patterns and trends in coastal recreation (by age, gender, race/ethnicity, household income, etc.), and other important statewide summaries of coastal recreational activity.

### Sampling Strategy

Online, web-based surveys can be coordinated through external service providers. For example, Knowledge Networks (KN) is a leading survey firm that maintains a standing Internet panel of survey respondents designed to be demographically representative based on the U.S. Census data. Panel members are randomly recruited by telephone using random digit dialing (RDD). Both listed and unlisted numbers are included. Households without internet are provided with access, including e-mail addresses, and then recruited by e-mail to participate in surveys. KN has developed a weighting system to ensure that its sample is demographically representative by age, gender, race/ethnicity, education, census region, zip code of residence, and household internet access status.

The sample frame for the standing KN panel is the entire U.S. population. To estimate the impact of California MPAs, however, the data collection agency may choose to limit the sample frame to California residents only. If an agency chooses to estimate the impact of MPAs in a region of the California coast (South, North Central, North) then they may choose to limit the sample frame to residents of the counties that comprise that region. For example, the South Coast of California region comprises Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura counties.

### Key Metrics

The following represent key metrics necessary to understand the socio-economic impact of MPAs. Online surveys should collect these variables in all cases.

- **Location of Residence.** Knowing where coastal recreational visitors come from is important to understanding the degree to which MPA formation supports the chosen activities of local residents or encourages residents of other areas to visit the MPA region. The location variables that should be collected include:
  - State
  - County
  - ZIP code of residence.
- **Demographics.** The identity of coastal recreational visitors matters. Various population segments may engage in different coastal recreational activities, in different locations. Patterns of coastal recreation may be affected by such factors as racial residential segregation, economic segregation, unequal access to motorized transport, the relative prices of coastal recreational activities, and generational patterns of recreational use. The demographic variables that should be collected include:
  - Age
  - Race/Ethnicity
  - Educational Attainment
  - Gender
  - Household Size/Composition
    - Number of adults
    - Number of children
  - Annual Household Income
  - Employment Status



- **Frequency and Type of Visits (last 12 months).** Identifying spatial and demographic patterns of the frequency and primary purpose of coastal recreational visits can shed light on the socio-economic effects of creating MPAs. How often do members of the public visit the coast? What proportion of coastal visitors tend to engage in recreation as part of trips for other purposes, such as visiting family or friends at the coast? What proportion of coastal visitors engage in recreation as the primary purpose of their visits? The variables related to visitation frequency and type that should be collected include:
  - **# Coastal recreational visits in the past 12 months.** Knowing the proportion of total coastal visits over the past 12 months for which recreation is the primary purpose is useful in understanding the relative importance and context of recreation for coastal visitors.
  - **Date of most recent visit.** Coastal recreational activities differ across seasons; knowing the date of the recreational user's most recent visit can assist in understanding seasonal use patterns.
  - **Primary purpose of most recent visit.** Coastal recreational visits may occur during trips for other purposes, for example: visiting family or friends, traveling for business or work, attending community gatherings or events, or other purposes not directly related to recreation.
  - **Duration of visit/s.** Coastal recreational visits may be day trips, overnight stays, or multi-day stays; knowing the distribution of trip lengths is useful for predicting the impact of increased visitation on revenues for lodging and hospitality businesses.
- **Location of Recreational Visits.** Collecting spatial data on the location of recent recreational visits can provide analysts with insight into where coastal recreational visitors tend to engage in their chosen activities. Collecting spatially explicit activity data over time can lead to understanding of the impact of MPA formation on activity locations. The advantage of an online survey is that the location of where recreation occur can be pinpointed to the exact location by integrating mapping features such as Google Maps.
- **Type/s of and Participation in Activities**
  - **Activity categories.** Data collection agencies should compile a list of recreational categories that is as exhaustive as possible. Survey instruments should include both general beachgoing categories - which include sitting, dog walking, walking, running, kite flying, or other activities such as picnicking - as well as more specific coastal recreational activities such as wildlife watching, photography, surfing, SCUBA diving or freediving, kayaking, sailing, fishing with hook and line, or windsurfing.
  - **12-Month Timeframe.** Knowing the full range of activities that coastal recreational visitors have engaged in over the last 12 months of visits is helpful in understanding overall recreational use patterns.
  - **Most recent visit.** Coastal recreational users will tend to have a clearer memory of the activity or activities that they have engaged in during their most recent visit.
  - **Primary activity.** Coastal recreational visitors often engage in multiple activities over the course of their visit. Understanding the activity that the recreational visitor identifies as primary, or most important, can shed light on changes in coastal recreational use patterns that collection of data encompassing all chosen activities may not detect.
- **Trip Expenditures.** Collecting data on trip expenditures associated with coastal visits, broken down by category, is critical for understanding the local and regional economic impact of changing coastal recreational use patterns. If MPAs bring about changes in the type, frequency, and duration of coastal visits, then the ability to estimate the resulting changes in trip expenditures, and the knock-on effects on coastal economic activity by sector, becomes a primary task of the analyst.

Collection of robust and validated trip expenditure data is a necessary step in the estimation of regional economic impact models. (For the details of how these models work, see Section 4, Economic Models, below.)

The trip expenditure variables that data collection agencies should collect include:

- **Expenditure categories.** Relevant categories include food and beverages from stores and/or restaurants; equipment or vehicle rentals by type (e.g. SCUBA dive equipment, surfboards, boats, kayaks, cars, etc.); charter fees; fishing licenses; entrance fees for museums, aquariums, or parks; fuel/gasoline for boats, cars, RVs, or other vehicles; parking fees; souvenirs or gifts; sundries; and lessons, clinics, or camps; etc.
- **Dollar expenditures by category.** Survey respondents should assign a dollar expenditure figure to each category; these dollar figures can be rough estimates if necessary.

### ***Citizen Science Programs***

Citizen science programs have proven to be an effective means of tracking the prevalence of coastal recreational activities across seasons.

Key metrics for citizen science program to gather are simply amount of use by activity category - often time this is simple just a log of the number of people seen engaging in a certain coastal recreation activity.

For example, MPA Watch engages citizen science volunteers in collecting data on coastal recreation using a survey protocol based on *transects*, or specific stretches of beaches of uniform length. Citizen science volunteers walk transects, count the number of coastal recreational users by activity, and record the date, time, and weather conditions. The data collected by citizen science volunteers can be checked against the online survey data for validation or refinement. The presence of a clearly defined protocol and volunteer training system ensures that the data collected is roughly consistent across volunteers.

One important limitation of citizen science programs is that their sampling strategy is dependent on the availability and willingness of volunteers to walk transects. Volunteers are likely to over-sample during good weather conditions and seasons (e.g. sunny and warm days, summer), and likely to under-sample during poor weather conditions and seasons (e.g. rainy or stormy days, winter). This limitation can be addressed in one of two ways: (1) regulating the volunteer sign-up process to ensure a uniform distribution across seasons and weather conditions, with the possibility of paid contractors or employees filling in on days when no volunteers are available, or (2) developing a sample weighting system that can ensure the representativeness of a survey day, given the season and weather conditions.

### Data Validation

If the citizen science dataset yields similar results to the online survey data on the relative frequency of coastal recreational activities by type and location, then the robustness of the online survey data can be more easily defended.

### Refinement

Citizen science data, if it is collected with sufficient variation by season, time of day, and weather conditions, can also help to refine online survey data by providing a richer understanding of recreational use patterns. If the citizen science data appears to be dramatically different from the online survey data, the analyst can attempt to reconcile the two datasets by comparing them while controlling for key variables, such as the season or month in which the survey was administered.

### Tier 1 Citizen Science Recommendations

Overall, MPA managers and research should be integrally involved in guiding and refining the design of citizen science methodologies and protocols in order to maximize their utility in long term MPA

monitoring. Furthermore, there may be synergies between citizen science data program that focus on monitoring specific sites and a statewide online survey effort (as detailed above) that could be utilized together to extrapolate site level citizen science data and enable comparison across citizen science program sites. It is recommended in Tier 1 that these efforts are implemented in order to maximize the utilize of citizen science data collection programs.

### **3.2. TIER 2**

Tier 2 recommendations build upon Tier 1 recommendations. It should be assumed that recommendations in Tier 2 are in addition to those recommended in Tier 1. We will specifically identify where Tier 2 recommendations augment Tier 1 recommendations--which are largely recommendations around augmenting a data collection methodology, adding additional metrics or adding complementary data collection efforts.

#### **3.2.1. Commercial Fisheries**

##### ***Landing Receipts***

Our primary Tier 2 recommendation for commercial fishing landing receipts is to record harvest location using 1x1nm mile blocks (instead of 10x10 nm blocks) which are already being utilized by the recreational fishing sector. Landing receipts should also allow for the entry of multiple 1x1nm blocks and allow for the entry of 10x10nm blocks for fisheries that are more expansive such as salmon and tuna fishing.

##### ***Capture of Spatial Fishing Data***

As stated before, the accurate capture of spatial fishing data is vital in providing data that is trustworthy, reliable, and robust enough to be utilized in long term MPA monitoring efforts. There is great need for fine scale human use data as often times biological data is captured using a fine-scale site specific methodology. In order for human use data to be integrated with biological monitoring data it is important to gather spatial data at a resolution that allows for relational linkages to be made.

That said, in baseline MPA monitoring efforts, in-person survey efforts were conducted to map commercial fishing grounds. These maps were then reviewed with the commercial fishing community overall to verify their accuracy. This type of effort was an effective way to take a snap-shot of spatial fishing patterns but were intensive in terms of the time and resource it took to conduct this data collection effort.

In Tier 1 the capture of harvest locations still remains self-reported and issues remain with capturing harvest location using a single or even multiple 10x10nm fishing blocks. In Tier 3 we discuss how technology could be utilized to more accurately gather harvest location data. However, if Tier 3 recommendations are not feasible to implement we would as a Tier 2 recommendation, that the monitoring program continue to utilize in-person interviews and community engagement methods to both map and verify spatial patterns of commercial fishing activities.

The goal of these mapping efforts would be to capture the spatial fishing patterns of commercial fishing so that it represented at least the majority of the economic value in a given port-fishery combination. Thus, we would recommend that interview sample designs be stratified across revenue levels to ensure interviews are both conducted across revenue levels but also are representing the majority of the economic value in the fishery.

We would like to note that if the primary objective of these in-person interviews is to map fishing patterns that interviews would be significantly streamlined (and thus require less resources) from past in-person

interview efforts as much of the data that were gathered in those interviews are recommended to be gathered in other methods mentioned in this report (e.g. online survey).

### ***Annual and Semi-Annual Surveys***

As stated in Tier 1 above, a survey that is issued every 1-3 years of commercial fishermen can provide additional information necessary to fully understand the socio-economic health of commercial fisheries. Specifically, surveys can be conducted where more in-depth information needs to be gathered that cannot be captured quickly (e.g. during license renewal) or needs to be captured at an annual or semi-annual time scale.

It is recommended that for an annual survey (could be every 2-3 years if resources are not available to conduct each year) that the survey be sent to all commercial fishermen. Fishermen could be contacted via phone, email, or physical mail -- all directing them to a web-based survey. The CDFW cannot require these surveys to be taken, however, efforts should be made to incentivize response rate such as entry into a series of prizes/giveaway (perhaps donated) or discounts on license fees, etc.

Below we provide the Tier 2 metrics that are additive to Tier 1 metrics that should be gathered using this method and the rationale for each key metric:

- Perceptions of drivers of economic and ecological changes
  - This metric is important qualitative data to gather in order to understand what factors are driving change in commercial fisheries. This will help to take inventory of the possible drivers as well as corroborate what researchers may be seeing in the data. It may also help to isolate what may be an effect of MPAs vs. other economic and ecological drivers. To help reduce data analysis time, these data could be captured as a series of categorical response questions as well as open-ended questions.
- Perceptions of ecological and economic MPA effects
  - This metric is important qualitative data to gather in order to understand what commercial fishermen perceive to be the impact of MPAs to be and which MPAs they perceive are impacting them. These can be both negative and/or positive impacts. These observations from commercial fishermen can provide important contextual data, corroborate research findings, and help research gain a user-centered perspective to inform research and monitoring efforts. To help reduce data analysis time, these data could be captured as a series of categorical response questions as well as open-ended questions.
- Attitudes towards MPAs and management
  - This metric is important qualitative data to gather as changes in attitudes can be indicators towards successful management outreach, education, and awareness efforts. This will be key to monitor over time as state agencies engage fishing communities in the long-term management of California's marine resources.
- Well-being/Quality of life
  - This metric is important to gather as economic data alone does not fully represent the socio-economic health of commercial fishermen. Capturing responses to well-being and quality of life questions will provide a fuller understanding of how well commercial fishermen are doing overall. To help reduce data analysis time, these data could be captured as a series of categorical response questions as well as open-ended questions.

It is important to mention that obtaining adequate representative participation and a time series of these data are vital in order to properly evaluate these data and make any statements that could be understood as representative of the entire commercial fishing fleet or adequate at measuring change over time.

### 3.2.2. CPFV Fisheries

#### *CPFV Logbook*

Our primary Tier 2 recommendation for CPFV logbooks is to record harvest location using 1x1nm mile blocks (instead of 10x10 nm blocks) which are already being utilized by the recreational fishing sector. CPFV logbooks should also allow for the entry of multiple 1x1nm blocks and allow for the entry of 10x10nm blocks for fisheries that are more expansive such as salmon and tuna fishing.

#### *Capture of Spatial Fishing Data*

As mentioned in the Tier 2 commercial fishing recommendations, the accurate capture of spatial fishing data is vital in providing data that is trustworthy, reliable, and robust enough to be utilized in long term MPA monitoring efforts. There is great need for fine scale human use data as often times biological data is captured using a fine-scale site specific methodology. In order for human use data to be integrated with biological monitoring data it is important to gather spatial data at a resolution that allows for relational linkages to be made.

That said, in baseline MPA monitoring efforts, in-person survey efforts were conducted to map commercial fishing grounds. These maps were then reviewed with the commercial fishing community overall to verify their accuracy. This type of effort was an effective way to take a snapshot of spatial fishing patterns but were intensive in terms of the time and resource it took to conduct this data collection effort.

In Tier 1 the capture of harvest locations still remains self-reported and issues remain with capturing harvest location using a single or even multiple 10x10nm fishing blocks. In Tier 3 we discuss how technology could be utilized to more accurately gather harvest location data. However, if Tier 3 recommendations are not feasible to implement, we recommend under Tier 2 that the monitoring program continue to utilize in-person interviews and community engagement methods to both map and verify spatial patterns of CPFV activities.

The goal of these mapping efforts would be to capture the spatial fishing patterns of CPFV vessels so that it represents at least the majority of the fishing effort in a given port. Given the limited CPFV operators in California it is feasible to interview the entire CPFV fleet and should be the sample strategy assuming they all could be contacted (highlighting the importance of capturing contact data during license renewal).

We would like to note that if the primary objective of these in-person interviews is to map fishing patterns, that interviews would be significantly streamlined (and thus require less resources) from past in-person interview efforts, as much of the data that was gathered in those interviews is recommended to be gathered in other methods mentioned in this report (e.g. online survey).

#### *Annual and Semi-Annual Surveys*

As stated in Tier 1 above, a survey that is issued every 1-3 years of CPFV operators can provide additional information necessary to fully understand the socio-economic health of the CPFV fleet. Specifically, surveys can be conducted where more in-depth information needs to be gathered that cannot be captured quickly (e.g. during license renewal) or needs to be captured at an annual or semi-annual time scale.

It is recommended that for an annual survey (could be every 2-3 years if resources are not available to conduct each year) that the survey be sent to all CPFV operators. Fishermen could be contacted via phone, email, or physical mail -- all directing them to a web-based survey. The CDFW cannot require these surveys to be taken, however, efforts should be made to incentivize response rate such as entry into a series of prizes/giveaway (perhaps donated) or discounts on license fees, etc.



Below we provide the Tier 2 metrics that are additive to Tier 1 metrics that should be gathered using this method and the rationale for each key metric:

- Perceptions of drivers of economic and ecological changes
  - This metric is important qualitative data to gather in order to understand what factors are driving change in CPFV fisheries. This will help to take inventory of the possible drivers as well as corroborate what researchers may be seeing in the data. It may also help to isolate what may be an effect of MPAs vs. other economic and ecological drivers. To help reduce data analysis time, these data could be captured as a series of categorical response questions as well as open-ended questions.
- Perceptions of ecological and economic MPA effects
  - This metric is important qualitative data to gather in order to understand what CPFV operators perceive to be the impact of MPAs to be and which MPAs they perceive are impacting them. These can be both negative and/or positive impacts. These observations from commercial fishermen can provide important contextual data, corroborate research findings, and help research gain a user-centered perspective to inform research and monitoring efforts. To help reduce data analysis time, these data could be captured as a series of categorical response questions as well as open-ended questions.
- Attitudes towards MPAs and management
  - This metric is important qualitative data to gather as changes in attitudes can be indicators towards successful management outreach, education, and awareness efforts. This will be key to monitor over time as state agencies engage fishing communities in the long-term management of California's marine resources.
- Well-being/Quality of life
  - This metric is important to gather as economic data alone does not fully represent the socio-economic health of CPFV operators. Capturing responses to well-being and quality of life questions will provide a fuller understanding of how well CPFV operators are doing overall. To help reduce data analysis time, these data could be captured as a series of categorical response questions as well as open-ended questions.

It is important to mention that obtaining adequate representative participation and a time series of these data are vital in order to properly evaluate these data and make any statements that could be understood as representative of the entire commercial fishing fleet or adequate at measuring change over time.

### 3.2.3. Recreational Fisheries

#### *License Purchase*

As stated in Tier 1 - the purchase of recreational fishing permits is a key touch-point with recreational fishermen that CDFW should maximize. In addition to the contact information captured in Tier 1 recommendation, additional information/metrics could be captured. It might not be feasible to capture these data for one-day license purchasers but could be achieved for annual license purchasers who can already purchase their annual license online and thus could easily provide this information:

- Demographics (Age, gender, ethnicity, household income level, education level)
  - Understanding the demographic profile of California saltwater recreational anglers will allow researchers to better understand how the impacts of MPAs or fisheries management unfolds unevenly across the population. Furthermore, gathering demographic data over time will help to understand changes and trends in the composition of California's saltwater angler community.

- Population attribute data is key in developing sample designs when it is not feasible to survey the entire recreational fishing population. This will help ensure sampling efforts are representative of the larger population.

### ***Accounting for Unlicensed Fishing Effort***

As an additional Tier 2 recommendation - in order to estimate the total population engaged in saltwater, one must also account for the amount of fishing effort that is unlicensed. Thus, infraction/citation data from CDFW enforcement sector should be utilized to estimate the proportion of the recreational fishing population that have not purchased recreational fishing licenses. This is an important data point to capture in order to accurately estimate the total recreational saltwater fishing effort across California.

### ***Capture of Spatial Fishing Data***

As mentioned previously, the accurate capture of spatial fishing data is vital in providing data that is trustworthy, reliable, and robust enough to be utilized in long term MPA monitoring efforts. There is great need for fine scale human use data as often times biological data is captured using a fine-scale site specific methodology. In order for human use data to be integrated with biological monitoring data it is important to gather spatial data at a resolution that allows for relational linkages to be made.

That said, in baseline MPA monitoring efforts, in-person survey efforts were conducted to map recreational fishing grounds. These maps were then reviewed with the recreational fishing community overall to verify their accuracy. This type of effort was an effective way to take a snapshot of spatial fishing patterns but were intensive in terms of the time and resource it took to conduct this data collection effort.

In Tier 1 the capture of harvest locations is captured through intercept surveys - however, it is unclear if these are representative of the larger recreational fishing patterns across California. In Tier 3 we discuss how technology could be utilized to more accurately gather harvest location data. However, if Tier 3 recommendations are not feasible to implement we would as a Tier 2 recommendation, that the monitoring program continue to utilize in-person and/or focus group type interviews and community engagement methods to both map and verify spatial patterns of recreational fishing activities.

The goal of these mapping efforts would be to capture the spatial fishing patterns of specific recreational fishing modes (private vessels, beach/bank, and man-made structure such as pier and jetties). Based on the experience of the authors of this report - a focus group type methodology may serve as the most efficient and effective method as often times the location of recreational fishing effort does not vary significantly from fisherman to fisherman. This is due to the fact that recreational fishing trips typically are only day-trips and thus limit the options of fishing location to certain habitat (e.g. rocky reef) that is close by or to specific locations (beach or piers). A focus group that convenes recreational fishermen who have deep knowledge of the recreational fishing grounds in their port could sufficiently represent the recreational fishing patterns of that port community.

We would like to note that if the primary objective of these in-person interviews or focus groups is to map the intensity of fishing patterns that interviews would be significantly streamlined (and thus require less resources) from past in-person interview efforts as much of the data that were gathered in those interviews are recommended to be gathered in other methods mentioned in this report (e.g. online survey).

### ***Annual and Semi-Annual Surveys and/or Focus Groups***

As stated in Tier 1 above, a survey that is issued every 1-3 years of saltwater recreational fishermen can provide additional information necessary to fully understand the socio-economic health of recreational fisheries. Specifically, surveys can be conducted where more in-depth information needs to be gathered that



cannot be captured quickly (e.g. during license renewal) or needs to be captured at an annual or semi-annual time scale.

It is recommended that for an annual survey (could be every 2-3 years if resources are not available to conduct each year) that the survey be sent to strategic sample of saltwater recreational fishermen. Fishermen could be contacted via phone, email, or physical mail -- all directing them to a web-based survey. The CDFW cannot require these surveys to be taken, however, efforts should be made to incentivize response rate such as entry into a series of prizes/giveaway (perhaps donated) or discounts on license fees, etc.

Below we provide the Tier 2 metrics that are additive to Tier 1 metrics that should be gathered using this method and the rationale for each key metric. These metrics could be gathered by adding this information to the **annual or semi-annual survey effort** or by utilizing recreational fishing **focus groups** in each port community to gain the perspective of fishermen who are more fully engaged in recreational fishing efforts. Focus groups could be convened through the help of local and state recreational fishing associations.

- Perceptions of drivers of economic and ecological changes
  - This metric is important qualitative data to gather in order to understand what factors are driving change in recreational saltwater fisheries. This will help to take inventory of the possible drivers as well as corroborate what researchers may be seeing in the data. It may also help to isolate what may be an effect of MPAs vs. other economic and ecological drivers. To help reduce data analysis time, these data could be captured as a series of categorical response questions as well as open-ended questions.
- Perceptions of ecological and economic MPA effects
  - This metric is important qualitative data to gather in order to understand what commercial fishermen perceive to be the impact of MPAs to be and which MPAs they perceive are impacting them. These can be both negative and/or positive impacts. These observations from commercial fishermen can provide important contextual data, corroborate research findings, and help research gain a user-centered perspective to inform research and monitoring efforts. To help reduce data analysis time, these data could be captured as a series of categorical response questions as well as open-ended questions.
- Attitudes towards MPAs and management
  - This metric is important qualitative data to gather as changes in attitudes can be indicators towards successful management outreach, education, and awareness efforts. This will be key to monitor over time as state agencies engage fishing communities in the long-term management of California's marine resources.
- Demographics (Age, gender, ethnicity, household income level, education level)
  - Understanding the demographic profile of California saltwater recreational anglers will allow researchers to better understand how the impacts of MPAs or fisheries management unfolds unevenly across the population. Furthermore, gathering demographic data over time will help to understand changes and trends in the composition of California's saltwater angler community.
  - Population attribute data is key in developing sample designs when it is not feasible to survey the entire recreational fishing population. This will help ensure sampling efforts are representative of the larger population.

### 3.2.4. Coastal Recreation and Tourism

#### *General Online Surveys*

Online surveys can be an important data source for estimating econometric models of MPA impact. Section 3.1.4 above outlines the basics of online surveys, their sampling strategy and the benefits of conducting

them regularly to derive summary statistics about coastal recreation at the state, regional, or local levels. Below we discuss two important econometric models and identify the variables that must be collected to estimate them: contingent valuation and travel cost.

#### Contingent Valuation: Willingness to Pay (WTP) and Willingness to Accept (WTA)

A contingent valuation study is a survey-based study in which participants are asked to state their willingness to pay (WTP), or accept payment (WTA), for well-defined changes in the levels of specific environmental attributes, such as air quality, water quality, or scenic views. Contingent valuation has been used by U.S. government agencies to measure public preferences for changes in water quality, biodiversity, and salmon populations.

Contingent valuation is relatively easy and low-cost to administer, which explains its wide adoption and use by government agencies. However, the method has been roundly critiqued by academics to the point where a prominent MIT economist declared it to be [hopeless](#) (Hausman 2012). The primary critiques of contingent valuation are as follows: (1) answers to hypothetical willingness-to-pay questions are consistently higher than actual revealed willingness-to-pay (hypothetical response bias); (2) large differences between WTP and WTA; and (3) lack of stable public preferences due to the “embedding effect”. In regard to the embedding effect: behavioral economists Daniel Kahneman and Jack Knetsch have found that individuals’ preferences for goods, services, or states of the world are dependent on the overall package of attributes in which the goods, services, and attributes are embedded. For example, survey respondents stated WTP for restoring a single stream, river, or lake, has been shown to depend strongly on the additional components of the restoration project queried in the contingent valuation study. In short, people have evinced the same WTP for restoring one lake as for restoring five lakes! As a result, adding or subtracting contextual information or scenario components from a contingent valuation study leads to dramatically different results in asking for WTP or WTA for the same changes in the levels of the same environmental attributes.

Any attempt to develop a contingent valuation study should be undertaken with the above caveats in mind. With the above caveats, contingent valuation studies may be useful as registers of public opinion on the topic of environmental changes. They cannot, however, be relied upon as plausible estimates of real-world preferences or economic behavior.

#### Travel Cost Models

Travel cost models are econometric (statistically based) models that use data on recreational visitation behavior to estimate the economic value that coastal recreational visitors place on recreational sites, or attributes of recreational sites such as water quality and wildlife. The theory behind travel cost models holds that recreational visitors will be willing to travel longer distances, at higher monetary and/or time cost, in order to visit more valuable recreational site attributes. Estimating a travel cost model thus requires collecting variables on the distance, time, and money spent in the course of traveling from the recreational visitor’s residence to the chosen coastal recreation site. Many travel cost models estimate the value of site attributes based on a visitor’s choice to visit one site among a large number of possible sites. These models are usually estimated using a discrete choice modeling framework such as logit (or sometimes probit). For more information about travel cost models, please see the Economic Models section below.

#### Variables

- **Transportation Variables.** The implementation of travel cost models requires the collection of transportation variables. Knowing the distance traveled, time involved in traveling, and mode of transportation chosen by the visitor allows the analyst to estimate total travel cost based on plausible assumptions. Collecting these variables thus allows researchers to identify and measure users’ preferences for various attributes of recreational sites, and ultimately derive measures of the non-

market economic value that users place on specific recreational sites or site attributes. The transportation-related variables that should be collected for a travel cost modeling study include:

- Mode of Transport
  - Vehicle Type (e.g. sedan, SUV, truck, public bus, private bus, etc.)
  - Miles Traveled
  - # of Total Passengers - including vehicle driver, unless the driver was hired
- **Targeting Specific User Groups.** A general coastal recreation online survey is designed to capture the coastal recreation activities that the majority of coastal users engage in. However, at times this method does not gather enough of a sample of specific user groups who state agencies may want to specifically engage due to their interest and significant economic contribution to the coastal economy.

For example, private boaters, SCUBA divers, surfers, and other specialize coastal recreation activities require a more targeted survey effort to adequately capture and represent their use patterns and the economic contribution of their recreation activities. The same general coastal recreation survey could be given to these user groups; however, specific efforts must be conducted to target and recruit respondents from these user groups.

This could be done by engaging local user group association such as boating clubs, SCUBA diving clubs and association, surfing advocate organization such as Surfrider Foundation, etc. Targeting these specific user groups an engaging them in an online survey will be key to representing the use patterns and economic value of these user groups. Thus, we recommend in Tier 2 to apply resources to engage and survey these groups.

- **Citizen Science Programs**  
In Tier 2, a more elaborate citizen science data collection program may consider adding a survey module on recreational visitors' travel behavior. A citizen science volunteer may be instructed to survey a randomly chosen portion of recreational visitors she encounters in the course of surveying a transect. For example, a volunteer may be instructed to survey every third or every fifth visitor encountered. Citizen science volunteers may survey recreational visitors using such questions as:
  - What city do you live in?
  - What mode of transportation did you use to get to this site?
    - (If a motor vehicle) What kind of motor vehicle did you use? Did the vehicle belong to you or to someone else? How many passengers were aboard the vehicle for this trip?
    - (If a public or privately hired transit vehicle) How much money did you spend to get from your home to this site?
  - How long did it take you to get from your home to this site?
  - Why did you choose to visit this site over all the other sites in this region?
    - This question can be used to validate or refine the results of travel cost models, including checking for the presence of omitted variables.
  - What is the primary purpose of your trip to the coast?
  - What activities are you most interested in engaging in at the coast today?

Adding a travel module to a citizen-science survey can allow for additional observations on travel costs, which may be used to develop a parallel set of travel cost studies. Collecting supplemental data for coastal recreational visitors' stated reasons for visiting specific sites can also validate, refine, or qualify the results of quantitative travel-cost model estimates. These data can assist in

identifying potentially omitted variables from travel cost model estimates, as well as probing non-economic motivations or reasons for coastal visitation behavior.

### **3.3. TIER 3**

In Tier 3 we focus on how technology can help advance data collection efforts in not only streamlining data collection but also help to gather more accurate data.

#### **3.3.1. Commercial Fisheries**

##### ***Digital Mobile Based Landing Receipts***

Many advances are being made in fisheries electronic reporting which include the development of digital landing receipt mobile applications. California would greatly benefit from a digital landing receipt system in several ways that addresses current weaknesses in its paper-based system. Digital landing receipts would:

- Automatically digitize data for entry into the CDFW databases making data available in a much quicker timeframe and available to managers and researchers
- Allow for the more accurate capture of spatial fishing location by utilizing a Google Maps type view for fishermen to indicate which CDFW 1x1nm fishing blocks they harvested their catch. Just this feature alone would improve the capture of spatial fishing information significantly compared to the current method of asking fishermen to provide only one fishing block number and remember the fishing block number from memory.
- Allow for a quick and easy way to link across data collection methods. For example, if digital logbooks existed - a simple scan of a digital logbook QR code would link fishermen fishery logbooks to landing receipts enabling a more robust and integrated analysis of both data sets. Similarly, if fisherman licenses number could be scanned as a QR code - a digital landing receipt could link automatically to a fisherman's license record removing possible manual data entry errors.
- Automate data entry such as automatically capturing date, time and landing location using the smartphone/tablet built in GPS features.

##### ***Digital Mobile Based Logbooks***

Similar to digital landing receipts - many advances have been made to develop digital logbooks that work both online and offline and utilize the GPS enabled technology that are now ubiquitous in smartphones and tablets. Digital logbooks offer the opportunity for fishermen to provide more detailed information on their fishing activities that are too cumbersome to capture at landing through a landing receipt.

Specifically, digital logbooks can:

- Capture information for each fishing event including location, effort, and estimated catch size.
  - Location: Automatically capture a fishing location through capturing the GPS location of the vessel and remove manual entry error or reduce the likelihood of false location information being captured. Capturing fine scale harvest location data is essential for MPA monitoring efforts.
  - Effort: Self-reported but more efficiently captured in a digital application
  - Estimated catch size: Self-reported and estimated - however if digital logbooks could be linked to digital landing receipts as mentioned above the self-reported data could then be verified or replace in lieu of the more accurate landing receipt data.
- Automatically digitize data for entry into the CDFW databases making data available in a much quicker timeframe and available to managers and researchers
- Allow a platform for CDFW to engage fishermen. For example, important news can be sent to fishers through the digital logbook application, reminders to upload their logbook data, reminders

of important management meetings, or short surveys can be sent to fishermen as well on an as needed basis. These are just some of the possibilities that utilizing a technology platform could open up.

### 3.3.2. CPFV Fisheries

#### *Digital Mobile Based CPFV Logbooks*

Similar to reasons stated above for developing commercial fishing logbook mobile applications--digital CPFV logbooks would enable the more accurate and robust capture of CPFV trip level information.

Specifically, digital mobile based CPFV logbooks would enable to the more accurate capture of spatial fishing location data. Currently CPFV logbook are design to capture information about a fishing trip as a whole. However, fishing trips likely consist of multiple fishing events where the boat is moved on to different fishing spots throughout the trip.

A mobile-based CPFV logbook could accommodate the capture of data for each fishing event such as:

- Location: GPS location of fishing event (could be the selection of a 1x1 nm block on a Google Map interface as well is fishing by trolling that covers an area vs. fishing at a specific location)
- Harvest Size: Number and pounds of fish caught by species
- Effort: Amount of time spent at fishing location

#### *Web-Based Angler Survey*

It was recommended in Tier 1 that CPFV logbooks be modified to capture the average price paid per anglers on a CPFV trip in order to roughly estimate gross revenue from CPFV operations. However, this only capture a portion of the economic value that CPFV anglers contribute to the coastal economy. Often there are significant trip expenditures associated with taking a fishing trip on a CPFV vessel and it is important to capture those expenditures in order to fully value the economic contribution of the CPFV sector.

It is recommended that a web-based survey is developed for CPFV anglers. Survey participants could be recruited from CPFV trips by CPFV operators. Incentives could be put in place to reward CPFV operators for securing a certain percentage of their customers. Incentives could also be put in place to entice CPFV anglers to participate in the survey such as entry into a lottery for prizes or discounts. CPFV anglers could be given a specific trip code in order to tie their survey response to the specific trip information captured in the logbook.

Key metrics to be collected in this web-based angler survey include:

- Location of residence
- Demographics
- Trip expenditures (e.g. transportation, food, accommodations, gear, etc.)
- Primary purpose of trip (if other than fishing)

### 3.3.3. Recreational Fisheries

#### *Digital Mobile Based Report Card Data Apps*

A key challenge to capturing recreational fishing data is that recreational fishing is practiced by a large population and is dispersed unevenly across California's coastline both in both space and time. This makes for intercept survey time and resource intensive.



To help address this key challenge, the use of mobile application technology could provide targeted ways to engage key recreational fishing user groups (e.g. spiny lobster, abalone, spearfishing, etc.) in capturing and submitting key fisheries harvest data.

As mentioned before the key metrics to be gathered in fishery specific recreational fishing report cards are: 1) Location of harvest; 2) harvest effort; and 3) catch amount. If fishery report cards were submitted via a smartphone application the location of harvest could automatically be captured and easily submitted to CDFW - address two key issues with the current paper-based report card system.

As mentioned earlier, current report cards have fishermen indicate the location name of where they harvested their catch. However, these locations do not have defined boundaries are subject to the fisherman's interpretation. Capturing the exact geo-location of harvest via a mobile application will provide more accurate and precise harvest location data bringing the granularity needed to compare socioeconomic human use data to site specific biological monitoring data.

### 3.3.4. Coastal Recreation and Tourism

#### *Online Surveys*

Online surveys have been discussed in the above two sections 3.1.4 and 3.2.4 as effective ways of capturing demographically representative, geographically broad, and detailed information regarding coastal recreational visitation behavior. A more elaborate online survey may contain additional modules covering the following topics:

#### Overnight or Multi-Day Visits

The basic survey questionnaire in Section 3.1.4 above included a question on duration of visit, in order to identify overnight or multi-day visits to the coast. A more elaborate survey would include a separate module for overnight or multi-day visitors, asking questions on topics including:

- The temporal and spatial pattern of recreational activities: which activities the visitor/s engaged in, on what days, at what times of day, and in what locations
- Additional information about non-recreational components of multi-day visits such as family reunions, business or work trips, including:
  - What proportion of each day spent with family/working/engaging in recreation
  - Overlap between recreation and family activities, or recreation and work activities (e.g. recreation with colleagues, recreation as part of work retreats or family reunions)
  - Location and type of lodging: hotel, motel, Airbnb, family/friend's residence, retreat center
  - Tourist activities not typically associated with coastal recreation and not covered by previous coastal recreation questions, including visiting historical sites, architecture tours, wineries, museums, coastal sporting events (e.g. sailing, beach volleyball) or entertainment (e.g. concerts, dance parties/raves, etc.).

#### Out-of-State Visitors

Researchers may consider expanding the online survey sample to include residents of adjacent states; residents of all West Coast states; residents of all U.S. West states including the interior West, Alaska, and Hawaii; or residents of the entire U.S. With more comprehensive data, researchers may develop geographically broader summaries of participation rates, chosen activities, trip lengths, trip expenditures, and preferences of coastal recreational visitors.

#### Choice Experiments

In addition to the uses identified above, online surveys can be used to conduct more sophisticated forms of stated-preference studies, such as **choice experiments**. Choice experiments are a form of stated preference

study wherein the analyst asks members of a population to choose their most preferred alternative from a series of bundles of attributes, provided at varying levels, and associated with varying prices. Estimating the results of choice experiments requires the use of a discrete choice modeling framework, such as logit. For more information about choice experiments, please see Section 4, Economic Modeling, below.

Implementing a choice experiment involves adding an additional module to an online survey that walks the survey respondent through a series of questions regarding her/his most preferred bundle of attributes/levels, as referenced above. Choice experiments often add several minutes to the time required to complete a survey, since they require that the respondents read and understand a *preamble* which explains the purpose and structure of the questions that will follow. Analyzing the results of choice experiments also involves additional time spent by the researcher, in estimation and interpretation.

Choice experiments are subject to many of the same weaknesses as all stated preference studies: hypothetical response bias, in other words the gap between people's stated preferences for various states of the world, and people's revealed preferences through their behaviors such as market purchases, voting patterns, and investing decisions. Their results, therefore, should be interpreted with caution.

### ***Citizen Science Programs***

#### Utilizing Mobile Applications

Citizen science volunteer programs can engage volunteers to collect spatially explicit data using mobile phones or tablets. Collecting spatially explicit data can allow for more sophisticated forms of data collection, whether ecological in nature such as phenology data (see below) or social scientific, such as place attachment and place identity (see below). With spatially enabled mobile application - the geo-location of human use data can be automatically captured and digitized on the spot removing the need for manual data entry. Digital data collection forms via a mobile application would also enable more uniform and consistent data collection forms to be developed and shared across citizen science programs.

Furthermore, by utilizing a mobile application - additional survey modules can easily be added to data collection protocols such as the additions we detail below:

#### Tracking Phenology

Phenology is the aspect of ecology that studies temporal changes: when flowers bloom, when leaves fall, when birds build their nests, etc. Citizen science can be mobilized to collect phenological data at coastal sites inside or adjacent to MPAs. Citizen science volunteers can collect spatial data, using iPhones or iPads (or other similar devices) on the location and timing of coastal patterns including bird and mammal migrations, flowering plants, and other visible indicators of coastal and marine life. This data could be integrated with biological monitoring data to corroborate or provide more contextual evidence for trends observed in biological datasets.

#### Place Attachment and Place Identity

To supplement these data further, survey designers may also choose to include open-ended questions to elicit statements from coastal visitors regarding non-economic motivations for specific coastal visitation patterns, including **place attachment** and **place identity**. Place attachment can be defined as “an affective bond that people establish with specific areas where they prefer to remain and where they feel comfortable and safe”. Place identity, by contrast, refers to “a process by which, through interaction with places, people describe themselves in terms of belonging to a specific place”.

Surveys can test for the intensity of place attachment and place identity through Likert-scale questions such as the following examples:



- Place identity: To what degree do you agree with the following statements (0 = Not at all, ... , 5 = Completely)
  - (Site name) is a part of me
  - I would not be who I am today without (Site name)
- Place attachment: To what degree do you agree with the following statements (0 = Not at all, ... , 5 = Completely)
  - (Site name) is my favorite place to visit
  - Doing (activity name) at (site name) is better than doing (activity name) anywhere else

Place identity and place attachment can also be mapped, by eliciting survey respondents to drop markers or pins on digital (GIS-based) maps to identify locations or sites of exceptional personal significance, beauty, meaning, or identity formation. These are important to capture in order to understand the relationship coastal users have with coastal areas they recreation within. Understanding this will help managers better design how to engage coastal recreation users in management measures and raise awareness and educate on local issues.

## 4. ECONOMIC MODELING

In this section we discuss economic modeling methods in order to better understand how economic data may be utilized (and thus why it should be collected) to evaluate the value of human uses and thus the marine resources of California.

### 4.1 Economic models

The economic models that are applicable to the socio-economic monitoring of marine protected areas are of two major types. The first, Input-Output Models, allow the analyst to estimate the short-run regional impact of a given pattern of expenditures. The second, Non-Market Valuation, allow the analyst to estimate the value that residents and the broader public place on specific attributes of coastal and marine sites and locations, as well as specific activities associated with those sites and locations. Below we provide an overview and critique of these models in more depth.

### 4.2 Input-Output Models

Input-output models capture the production structure of an economy based on the relationships between inputs to the production of goods and services and the quantity of the final goods and services produced. The most commonly used input-output model is the IMPLAN model, available for purchase through MIG, Inc. The foundation of the IMPLAN model is the Input-Output tables published by the U.S. Department of Commerce. IMPLAN uses a range of datasets from the Bureau of Labor Statistics and Bureau of Economic Analysis to incorporate employment, labor income, and taxation into the model.

The Bureau of Economic Analysis also publishes its own input-output model called [RIMS](#), which is simpler than IMPLAN. RIMS is essentially a set of multipliers that indicates the direct, indirect, and induced impacts of an investment on employment and output/economic activity. Unlike IMPLAN, RIMS does not provide estimates of the breakdown of jobs and/or output by economic sector.

Input-output models allow for results that are directly comparable to one another. A model such as IMPLAN estimates job creation, value added, output, labor income, and federal, state, and local tax revenue by sector. The primary data requirement for successful input-output modeling is a robust and validated set of data on expenditures by currency, economic sector, location, and year. The location specified can be as fine-grained as ZIP code or as coarse as state level.

IMPLAN and other input-output models estimate direct, indirect, and induced impacts. The **direct impact** of an expenditure pattern is simply its impact without taking into account additional resulting purchases. For instance, a purchase of building construction services will give rise directly to a certain number of jobs, without taking into account additional purchases of materials or supplies. The **indirect impact** of an expenditure consists of the effect of the purchase and/or rental of production inputs, raw materials, equipment, and rent or amortized ownership costs of land or building real estate involved in producing a good or service (but not the real estate of the business owners' or workers' residences). The **induced impact** consists of the effect of consumption expenditure patterns, including food, housing, and other personal consumption items, by the businesses directly and indirectly involved in producing the good or service.

The weaknesses of input-output models are several. First, they are **static**, meaning that they take the structure of the economy as a given and do not incorporate potential changes in the use of inputs, equipment, or labor as a result of changes in technology or business practices. Second, they are **short-run**; they cannot trace the impacts of the initial pattern of expenditures beyond the event year during which they occur. Third, the number of economic sectors into which one can categorize expenditures is limited: the IMPLAN model consists of 440 sectors, which is a far cry from the thousands of economic sectors classified under the 6-digit NAICS (North American Industry Classification System).

#### **4.3 Non-Market Valuation Techniques**

Non-market valuation techniques are attempts, through careful survey design and econometric analysis, to infer the dollar value that a population places on a given attribute of a good or service that is not directly for sale. For instance, the value of an unimpeded ocean view can be inferred through the econometric analysis of the contribution of such views to the price of residential properties that possess them. Non-market valuation techniques are frequently used to estimate the economic benefits from the conservation, protection, or restoration of natural ecosystems. Such conservation or restoration efforts can benefit local and regional economies through attracting tourism, promoting local recreational industries, increasing property prices, or promoting overall health and well-being. The full value of the restoration activities cannot be captured entirely through analyzing directly related expenditures, such as park user fees or local spending on recreational goods and services. Thus, non-market valuation is an important tool for measuring impacts.

Non-market valuations are of two major types: **stated preference** and **revealed preference**. **Stated preference** studies involve direct queries of willingness-to-pay for either a single attribute or a package of attributes. There are two major types of stated preference studies currently in wide use: **contingent valuation** and **choice experiments**.

**Contingent valuation** studies involve directly asking members of a population their willingness-to-pay (WTP) for specific increases in the provision of a given non-market good or service. An alternative approach involves asking respondents for their willingness-to-accept (WTA) payment for decreases of the provision of the good or service.

Contingent valuation may have value in estimating the socioeconomic impact of MPAs. An example would be a study in which respondents are asked their willingness to pay for an increase in the population of marine mammals, an increase in water quality, or any other attribute associated with the implementation of MPAs. Since MPAs involve increased (rather than decreased) levels of a range of environmental attributes, the WTP (rather than WTA) formulation is appropriate.

There are two major weaknesses of contingent valuation studies. First, in studies that involve both stated and revealed preference (see below), respondents' stated willingness to pay for increases in the levels of environmental attributes often does not match their revealed pattern of market behavior. Second, in studies that include both WTP and WTA, the two measures often fail to match: respondents' willingness to pay for a given increase in the level of an attribute do not equal their willingness to accept payment for an equivalent decrease in the level of the same attribute. This discrepancy may be due to the psychological characteristic of *loss aversion* in which losses are felt more strongly than equivalent gains.

**Choice experiments** are a form of stated preference study wherein the analyst asks members of a population to choose their most preferred alternative from a series of bundles of attributes, provided at differing levels, and associated with differing prices. Choice experiments were invented for the field of marketing economics, wherein analysts were interested in consumers' willingness to pay for individual attributes comprising a product. For example, in the case of a personal computer, relevant attributes might include hard drive capacity, RAM, and screen size. Applied to a non-market environmental "good" such as a beach, relevant attributes might include beach width, water quality, and the presence or absence of wildlife (such as birds or marine mammals).

The design of the choice experiment allows the analyst to isolate the implicit price, or marginal willingness-to-pay, of respondents for changes in the levels of provision of each attribute. In the case of the beach referenced above, the choice experiment would allow an analyst to answer the question, "How much would the average beach visitor be willing to pay for an increase in beach width of 100 feet?"

Choice experiments allow for significant flexibility in the definition of attributes. Attributes and levels can be defined through photographs, videos, physical descriptions, or other means such as sounds. The analyst can label the levels of attributes using relative ranking or scoring rubrics (e.g. Low, Medium, and High, or 1, 2, and 3); however, experiments are more effective when both attributes and levels are carefully defined through precise language and/or other media of communication. A typical choice experiment consists of three to five attributes, each taking three to five different levels. Adding more attributes or more levels creates additional complexity - and therefore requires additional computing power - in experimental design, estimation, and interpretation of results.

One of the primary strengths of choice experiments is that they allow the analyst to measure responses to changes that have not occurred, or that the survey respondent has not experienced directly. This property of choice experiments allows analysts to measure a much wider array of possible changes in ecological management regimes.

Choice experiments have several weaknesses. One weakness, similar to that of contingent valuation, is that stated preferences often diverge from observed choice behavior. Another weakness is that combinations of attributes may be difficult to understand, open to interpretation, or understood differently by different user groups. A third weakness is the omission of salient attributes whose inclusion would affect the survey respondent's choices systematically.

#### **4.4 Revealed Preference Studies**

The main alternative to a stated preference study, such as contingent valuation or a choice experiment, is a revealed preference study. Revealed preference studies use observed market behavior to identify and measure implicit values of the attributes of goods and services. Hedonic price studies are the most common forms of revealed preference studies. A hedonic price study measures statistically the relationship between the market prices of goods/services and the attributes of those goods/services. For instance, a study might measure the relationship between the price of a house and attributes such as floor space, heating source,

roof condition, and/or the quality of local schools, parks, and amenities. Hedonic price studies can also be applied to environmental goods or services that are not for sale, such as local air quality or water quality. For environmental goods with multiple attributes, however - such as recreation sites - the appropriate revealed preference framework is the *travel cost model*, which is discussed below.

#### **4.5 Travel Cost Models**

Travel cost models allow the analyst to identify and measure the implicit dollar value that the average coastal recreational visitor places on the attributes of one or more coastal recreational sites, based on the cost that the visitor is willing to pay to travel to that site or sites. Travel cost models can cover either single sites or multiple sites. In a single site model, the analyst collects data on the number of visits that individual users pay to a given recreational site over the course of the study period (e.g. one year). Different recreational visitors will pay different “costs” to visit the site under study, depending on the distance necessary to travel from the visitor’s residence to the recreation site. The analyst estimates a “demand curve” for the site based on the number of visits that visitors engage in, dependent upon distance/cost.

The primary limitation of the single site model is that the analyst cannot estimate the value of the individual attributes of the site, only the value of the site as a whole. In order to estimate the value of each of the component attributes of the site, a choice model covering multiple sites is necessary. The *random utility model* is the most common multi-site travel cost model, and we discuss that model next.

#### **4.6 Random Utility Models (RUMs)**

Random utility models (RUMs) are the most common framework used to estimate the implicit economic value of the attributes of recreational sites. A RUM models the recreational visitor’s choice or decision to visit one particular site from a set of multiple sites on a single occasion. The model assumes that site choice is dependent on the characteristics of the site. For example, a beach visitor may choose to visit a specific beach for its high water quality, surf break, proximity to bathrooms or concession stands, and/or scenic vistas. The model is called *random utility* because it assumes that site choice is a function of a set of variables, such as site characteristics and travel cost, as well as a random component or error term. RUMs are estimated using a discrete choice model framework, usually a logit.

The primary strength of revealed preference models, such as travel cost/RUMs, is that they use recreational visitors’ observed market behavior as data in estimating the value of site attributes. The discrepancy between stated preferences and observed behavior does not come into play. There are several weaknesses of these models, however, including the possibility of omitted variables. The models also rest on the assumption that travel time itself has an economic value that can be measured, and is usually linked to the visitor’s salary or hourly wage rate. Finally, recreational users may choose sites for reasons other than the observable attributes of the sites; for example, a family history of visiting the site. These non-economic reasons for site choice cannot be analyzed using RUMs and will be captured in the error term of the model.

#### **4.7 Other Frameworks**

Input-output analysis and non-market valuation are the two most common frameworks for assessing the impact of an intervention that changes patterns of economic behavior, such as the establishment of MPAs. They are not the only two frameworks for making such an assessment. The field of evaluation has developed a range of techniques for measuring the impact of a program or intervention on a population. While randomized, controlled experiments remain the ideal, evaluators and economists have developed a range of techniques of rigorous analysis in their absence. The family of evaluation studies called comparison group evaluations provides the most reliable quantitative methods for this task.

#### **4.8 Comparison Group Evaluations**

A comparison group evaluation of the impact of MPAs would estimate the impact of MPAs on either whole coastal communities located inside or adjacent to them, or individual fishermen or groups of fishermen whose preferred fishing grounds are located either inside or adjacent to them. These studies would create robust impact estimates by constructing *comparison groups* of communities (or individual fishermen) located outside or distant from MPAs that share as many characteristics as possible with the communities (or individuals) located inside or adjacent to them.

**Propensity Score Matching (PSM)** is a good method to implement comparison group studies. In a PSM study, the analyst identifies a set of control variables (or covariates) that predict whether the nonrandom “treatment” is likely to occur. For instance, the case of MPAs, the ecological characteristics of a coastal/marine site can be used as covariates to predict whether that site is likely to be included in an MPA. The PSM approach makes two important assumptions: (1) that the probability of treatment (MPA inclusion) is solely dependent on characteristics that can be observed and measured, and (2) that the characteristics in question do not perfectly predict or sort the population into treated and non-treated groups.

To develop a PSM study, the analyst chooses a set of covariates that s/he believes accurately predicts treatment. The analyst then chooses a function, called the *matching algorithm*, to estimate the probability that the treatment (MPA inclusion) will occur, conditional on these covariates. PSM studies usually use either logit or probit models in estimating probabilities. Finally, the analyst estimates the effect of treatment conditional on the probability (or propensity score) generated from the previous step.

#### **4.9 Data Considerations**

In developing a robust socio-economic monitoring and indicators system for MPAs, the primary consideration for the effective use of economic models will be the collection and validation of consistent, comprehensive economic data. As stated above, collecting good expenditure data is critical for the successful application of input-output models. Collecting high-quality data on travel behavior is essential for non-market valuation. If the CA Ocean Protection Council creates consistent and robust large-sample datasets, then they will find no shortage of analysts ready to work with them. The most attractive datasets would follow a large number of individuals from the same population over multiple time periods (longitudinal data).

#### **4.10 Additional Research Questions**

Economists are increasingly employing more sophisticated models of human behavior in the design and implementation of studies. For instance, economists increasingly study the way that heuristics or cognitive biases, such as loss aversion or hyperbolic discounting, lead to human economic behavior that departs from perfect rationality. As an application of this thinking to MPAs, future studies might examine the impact of heuristics and biases on coastal resource users' economic behavior in the presence of MPAs. For instance, does the anticipation of establishment of an MPA in the future affect present commercial fishing behavior?

### **5. CONCLUDING REMARKS**

State agencies are faced with the mandate to manage MPAs using ecosystem-based and adaptive management measures to ensure the ecological and economic sustainability of coastal communities into the future. To do so, requires cost-effective and innovative approaches to collecting robust, fine-scale, and

spatially explicit socioeconomic human use data that will better enable managers to design, monitor, and adapt the targeted management measures needed to effectively reach sustainability goals.

It is our hope that with this report we have provided a tiered approach as to what are the key metrics to monitor in each human use sector (commercial fishing, commercial passenger fishing vessels, recreational fishing, and coastal recreation) and how methods to monitor the socioeconomic dimensions of MPAs could scale up as resources become available. Given this, we attempted to leverage existing data collection efforts as much as possible and how both changes and additions to these existing efforts can as a whole provide a comprehensive monitoring program that is robust and aligns data across human use sectors.

We want to emphasize that utilizing and investing in technology will be a key aspect in enabling state agencies to cost-effectively scale up and adaptively manage their monitoring efforts over time. Not only will technology enable more effective and reliable gathering of data but utilizing technology will also enable managers and researchers to change data collection instruments as necessary which will be key in continually improving monitoring efforts into the long term.



Appendix E:

**DEEPWATER  
WORKSHOP REPORT**



*California Ocean Protection Council  
California Department of Fish and Wildlife  
Moss Landing Marine Laboratories*

## Meeting Summary

### Deep-Water Marine Protected Area Monitoring Workshop

April 19, 2017; 10:00 AM – 6:00 PM  
April 20, 2017; 8:00 AM – 2:00 PM  
Seminar Room  
Moss Landing Marine Laboratories  
8272 Moss Landing Drive, Moss Landing, CA 95039

#### WORKSHOP ATTENDEES

Name	Organization	Attendance
Carrie Bretz	California State University Monterey Bay	Wed
Rachel Brooks	MLML	Wed/Thurs
Mark Carr	Department of Ecology and Evolutionary Biology - Long Marine Laboratory	Wed/Thurs
Jenn Caselle	Marine Science Institute - University of California, Santa Barbara	Wed/Thurs
Cyndi Dawson	Ocean Protection Council	Wed/Thurs
E.J. Dick	NOAA NMFS SWFSC - Santa Cruz Laboratory	--
Ryan Fields	MLML	Wed/Thurs
Mary Gleason	TNC	Wed/Thurs
Kristen Green	Stanford University	Wed
Scott Hamilton	MLML	Wed/Thurs
Katie Kaplan	OPC	Wed/Thurs
Tom Laidig	NOAA NMFS SWFSC - Santa Cruz Laboratory	Wed/Thurs
Andy Lauerman	MARE	Wed/Thurs
James Lindholm	California State University Monterey Bay	Wed/Thurs
Melissa Monk	NMFS - Santa Cruz Laboratory	Wed/Thurs
Steven Morgan	UCD - Bodega Marine Laboratory	Wed/Thurs
Becky Ota	CDFW Marine Region	Wed/Thurs
Nick Perkins	OPC	Wed/Thurs

Mike Prall	CDFW	Wed/Thurs
Dirk Rosen	MARE	Wed/Thurs
Ben Ruttenberg	Cal Poly	Wed/Thurs
Rick Starr	MLML	Wed/Thurs
Brian Tissot	Humboldt State University	--
Jessica Watson	ODFW	Wed/Thurs
Steven Wertz	CDFW	Wed/Thurs
Lauren Yamane	OPC - UC Davis	Wed/Thurs
Eric Poncelet	Kearns & West (facilitator)	Wed/Thurs
Zach Barr	Kearns & West (facilitator)	Wed/Thurs

## INTRODUCTION

The California Ocean Protection Council, the California Department of Fish and Wildlife, and Moss Landing Marine Laboratories convened a two-day workshop in Moss landing on April 19-20, 2017 engaging deep water ecosystem monitoring experts in discussions around developing a deep-water ecosystem monitoring framework to support statewide marine protected area (MPA) monitoring, including monitoring of both individual MPAs and California’s MPA Network.

The objectives of the workshop were to: 1) discuss and identify the most important MPA monitoring questions to address, including adaptive management questions; 2) identify which taxa and habitats are most important to monitor to address the monitoring questions; and 3) limit the range of possible objectives related to monitoring.

The workshop was structured into discussions of the following four main topic areas (see Appendix A for the full agenda):

1. Structure, function, and integrity of ecosystems
2. Taxa
3. Metrics
4. Adaptive management

The sections below capture the key outcomes of the workshop’s breakout session and plenary discussions.

## KEY OUTCOMES

**Topic 1: What does “Protecting the structure, function, and integrity of ecosystems” mean with respect to MPA monitoring?**

**1. In individual MPAs across the network, do focal and/or protected species inside of MPAs stay the same or increase in size, density, and biomass relative to areas of similar habitat adjacent to and distant from MPAs?**

- Our primary task is to determine if this question is sufficient to address the goals of the MLPA
- Abundance and size of species can be measured in a reasonable way and are of interest. However, productivity is really important for ecosystem function/services
- How we define habitat and function is important
  - Important to be able to justify species importance
- Need to be able to answer stakeholder questions about MPA goals, is it more about what's inside or outside?
  - Effectiveness of MPAs is related to species abundance outside MPAs
- Need a discussion on community metrics vs. focal species – Do we measure community level responses (e.g. diversity), or do we have focal species that we monitor through time as representative of the entire community
- **Summary questions from South Coast Monitoring Plan (Jenn Caselle)**
  - ***“What is the current condition or state of communities inside and out of MPAs?”***
    - Use of focal species and ecosystem level patterns
  - ***“How does the baseline state of communities change over time?”***
    - Need for the use of the same metrics over time in order to monitor change
  - ***“Are there changes in community level dynamics inside and out of MPAs?”***
    - Important to look at how density and/ or mean are changing over time, or increasing/decreasing variance through time
    - Changes in focal species densities can relate to the ecosystem function that might change over time
  - **ULTIMATELY: *“What is it like now? How are things changing over time, and can we look at other metrics other than density or mean counts”***

**2. Do species richness and/or diversity stay the same or increase in MPAs relative to areas of similar habitat adjacent to and distant from MPAs?**

- **Key question: *Should we focus on focal species or species composition?***
  - Target focal species but collect additional community data, habitat data, etc. secondarily
  - If the right sample design is chosen, can approximate a full community study without having to invest in one
    - Video surveys provide the opportunity to go back and get more information when new questions come up
  - Functional diversity and functional richness provides a better means of assessing ecosystem health compared to taxonomic diversity
  - Need to have the capacity to capture unanticipated environmental stressors (long term) as well as fishing pressure (short term)

- Need to collect info on additional species beyond fisheries species –design study to collect a variety of data
- Size and density are tractable, measureable, and more likely to see a change-so should be included

**3. Can we monitor a series of MPAs (distributed along the coast) and consider results to be representative of the overall MPA network performance?**

- Sampling intensity in a few MPAs vs. sampling less intensively in lots of MPAs?
- Instead of sampling each MPA individually selectively sample and then characterize regions as a whole
- Look at change over time and space – in/out differences should be detectable
- Target habitat focus → rocky reefs, justification: concerns with fishing, state guidelines prioritize rock, however, context of habitat around any rocky reef is important
  - Secondary habitat focus include sandy bottoms

**4. What other ways can the state determine if MPAs are protecting the structure, function, and integrity of ecosystems?**

- Need to come up with approximate measure of fishing pressure and human impact → compare MPAs to areas outside MPAs
  - Important to estimate local F (fishing mortality) – can help with site selection in terms of where we would see the greatest response
  - Match ROMS modeling with MPA sampling – better understand fish recruitment data (paucity of recruitment data in deep water habitats)

**Topic 2: Which taxa are best used to assess the performance of the CA MPA Network at protecting marine wildlife, rebuilding depleted populations and protecting the structure, function, and integrity of ecosystem?**

**Breakout Group Discussion:**

**Region 1 North Coast Participants:** Cyndi Dawson, Katie Kaplan, Andy Lauerman, Nick Perkins, Jess Watson, Steven Morgan, Melissa Monk

**Region 2 Central Coast Participants:** James Lindholm, Scott Hamilton, Becky Ota, Kristin Green, Mary Gleason, Steven Wertz, Mike Prall, Rick Starr

**Region 3 Southern Coast Participants:** Carrie Bretz, Jenn Caselle, Ben Ruttenberg, Steve Wertz, Lauren Yamane

**1. Which taxa are sufficiently abundant to enable statistically significant estimates of changes in the metrics identified in Appendix 1?**

### Region 1 North Coast:

- Suggested taxa (with rationale):
  - Metridium and hydrocorals, seawhips – Structure/function species, some are groups of multiple species but fill the same functional role
  - **Commercially important species:**
    - 1) Gopher Rockfish
    - 2) Lingcod
    - 3) Quillback Rockfish
    - 4) Vermilion Rockfish
    - 5) Canary Rockfish
    - 6) Yelloweye Rockfish
  - Avoid destructive sampling (trawl, hook-and-line) instead use video survey tools

### Region 2 Central Coast:

- **Exclude black corals** – *not sufficiently present, mostly in southern habitats*
- **Soft Bottom Habitat:**
  - 1) Sea whips
  - 2) Sea pens
  - 3) Brittle stars
  - 4) Sea cucumbers
  - 5) Halibut
  - 6) Starry flounder
  - 7) Sanddabs
- **Hard Bottom Habitat:**
  - 1) Large sponges – fish habitat
  - 2) Large solitary – fish habitat
  - 3) Sea cucumbers
  - 4) Rockfishes – Vermillion, Canary, Olive, Yellowtail, Blue, Kelp, Rosy, Boccacio, Dwarf Rockfishes, Greenspotted, Greenstriped, Brown
  - 5) Ratfish
  - 6) Spot prawns
  - 7) Thornyheads
  - 8) Long nose skates

### Region 3 Southern Coast:

- **Developed a criteria for high priority fish:**
  - Fished (1)
  - Non-fished (2)
  - Threatened/endangered (3)
  - Ecosystem engineers/habitat forming (4)
  - Important prey species (5)
  - Trophic function (6)
  - Aggregations (7)

- Cross depth (8)
- Climate change sentinels (9)
- Abundant enough to statistically assess (10)
- Identifiable on video (11)
- Keystone (12)
- Large range (13)
- **Assigned species to different tiers**
  - **Tier 1 (T1)** – high importance, contribute economically
  - **Tier 2 (T2)** – secondarily captured, wouldn't necessarily design a monitoring project around them
- **Hard Bottom Species:**
  - 1) CA Sheephead (1,8,10,11,12) T1
  - 2) Lingcod (1,8,10,11,13) T1
  - 3) Gopher/Copper Rockfish (1,5,8,10,11,13) T1
  - 4) Vermillion/Canary/Yelloweye Rockfish (1,10,11,13, Canary and Yelloweye also 3) T1
  - 5) Halfbanded and Squarespot Rockfish (2,5,10,11,13) T1
  - 6) Aurora/Splitnose Rockfish (1,13,10,11) T1
  - 7) Cowcod/Bocaccio (1,3,11,13) T2
  - 8) Abalone (3) T3
  - 9) Sea cucumber (1,8,10,11) T1
  - 10) Lophelia (coral) (9,4,11) T2 not habitat forming, limited MPA effects
  - 11) Habitat forming inverts (sponges, anemones, etc)(4,10,9,8,11 at least to group,13) T1
  - 12) Box crabs (1) T2
  - 13) Sheep crab (1,10) T2
  - 14) Rock crab (1) T2
  - 15) Lytechinus (urchin) (5, Sheephead prey) T2
  - 16) Brittle stars (4) T2
  - 17) Sea stars (Pycnopodia, Arastia, Bat star, Henricia, Solaster)(12, Pycnopodia is 8) T2
  - 18) Black seabass (3) T2
  - 19) Ocean whitefish (1,11) T2
  - 20) Scorpionfish
  - 21) Elk kelp T2
- **Soft Bottom Species:**
  - 1) Barred sandbass T1
  - 2) Sanddabs T2
  - 3) Pink surfperch
  - 4) Angel shark T2
  - 5) Ridgeback prawns
  - 6) Angel sharks

## **2. Which taxa are not sufficiently abundant but should be monitored anyway, and why?**

### **Region 1 North Coast:**

- Response nested in question one

#### Region 2 Central Coast:

- **Hard Bottom Habitat:**
  - 1) Yelloweye Rockfish
  - 2) Cowcod

#### Region 3 Southern Coast

- Response nested in question one

### 3. Which of the above taxa can be used to aid in fisheries management?

#### Region 1 North Coast:

- Large commercially important Rockfish and Lingcod
  - These are fished species that are most likely to be impacted by spatial closures

#### Region 2 Central Coast:

- Everything listed above as a targeted species – *Especially* species that lack a stock assessment

#### Region 3 Southern Coast:

- No response

### 4. What other taxa will be surveyed in the process of monitoring the focal species?

#### Region 1 North Coast:

- Habitat forming species (gorgonians, hydrocorals, metridium or other invertebrates (sea stars)
- All small fishes that are not focal species – most likely observed

#### Region 2 Central Coast:

- Criteria for species selection (assuming the use of a video tool)
  - **Primary target** – Species that are in high enough abundances to be valid under all statistical tests and are economically important
  - **Secondary target** – Species that are rare and patchy enough leading statistical analysis to be difficult
    - “Secondary” means sampled opportunistically as an environmental indicator, not of direct importance
    - 1) Sheephead – Secondary target
    - 2) Wolf eel – Secondary target
    - 3) Sablefish – secondary target



- 4) Dungeness crab – secondary target
- 5) Basket stars and crinoids – secondary target
- 6) Colonial anemones – secondary target

### Region 3 Southern Coast:

- No response

## 5. *Are there specific taxa that occur in all parts of the MPA network and that should be monitored to enable an understanding of differences in MPA response across the state?*

### Region 1 North Coast:

- Habitat invert metrics: Counted for density only, no sizing – using categorical approach to measure large groups of inverts
- Rockfish metrics: Density and size
- What are the criteria for choosing fish?
  - Targeted/overfished and depleted species
  - Abundant
  - Expected response to MPA
- Invertebrate criteria:
  - Indicator of structure and function
  - Sensitive to environmental changes
  - Abundant and widespread
- **OVERALL:**
  - Focusing on a few particular commercially and recreationally important rockfish species, we would be able to collect data on many of the other species in the surveyed areas (smaller species and inverts).
  - How about greater than 100 meters? Deeper Canyons were agreed to be difficult to survey. Many people thought they possibly should be avoided by these surveys.
  - Hard to justify direct sampling effort for soft bottom species. Soft bottom species move around so much – and soft bottom habitat shifts too. The power of a soft bottom study would be low.

### Region 2 Central Coast:

- Suggested taxa:
  - 1) Lingcod
  - 2) Bocaccio
  - 3) Widow Rockfish
  - 4) Kelp Greenling
  - 5) Black Rockfish

- 6) Vermillion Rockfish
- 7) Canary Rockfish
- 8) Sanddabs
- 9) Slender Sole
- 10) Dover Sole
- 11) Rex Sole
- 12) Dwarf Rockfish
- 13) Sea Cucumber
- 14) Metridium

- Include functional groups that persist across the whole state, even if the members of that group change over time

### Region 3 Southern Coast:

- No response

### Overall Group Report:

**Summary:** A consensus was that rocky reef should be the focus, with the possibility of some soft bottom sampling. The way to adequately sample soft bottom was not decided upon – because soft bottom habitats are highly variable and may require multiple approaches. The group agreed that monitoring could be conducted using a tiered approach, which focuses primarily on benthic groundfish species such as key Rockfishes and Lingcod. Dwarf Rockfish species were included to measure overall ecosystem health, and some large invertebrates were included as critical habitat forming species. It was assumed that a visual tool would be used so that research teams could go back at a later date and pull out additional information on other species if needed.

<b>Tier 1 Species List</b> Species with statewide distribution that are of particular interest around which sampling methodology is designed for all regions	
Yelloweye Rockfish	
Vermillion Rockfish	
Canary Rockfish	
Copper Rockfish	
Dwarf Rockfishes	
Aurora/Splitnose Rockfish (Deeper sampling required)	
Lingcod	
CA Sheephead (Regional importance – Southern CA)	

Barred Sandbass (Regional importance – Southern CA)
Sea Cucumbers (Southern CA fishery)
Structure/Habitat forming invertebrates (Large solitary anemones and sponges)

<b>Tier 2 Species List</b> Species that will be opportunistically surveyed when designing sampling for Tier 1 species (This is not a complete list of possible species).
Bocaccio
Cowcod (May require higher rates of sampling to adequately survey)
All other Rockfishes (Brown, Gopher, Quillback, Green Spotted, Green Stripped, Widow Rockfish, etc.)
Sablefish
Ratfishes
Long nose skate
Black Seabass
Ocean whitefish
Scorpionfish
Sanddabs
Angel Shark
Starry flounder
Halibut
Mobile invertebrates (Sea stars, Crinoids, Urchins, Ridgeback prawns, Rock crab, Sheep crab, Box crab)
Sessile invertebrates (Lophelia corals, brittle stars)

## Topic 3: Metrics

### Breakout Group Discussion:

**Group 1:** Ben Ruttenberg, Cyndi Dawson, Rick Starr, Andy Lauerman, Steven Morgan, Mary Gleason, Mike Prall, Tom Laidig, Mark Carr, Ryan Fields, Jimmy Williamson

**Group 2:** *Nick Perkins, Jenn Caselle, Scott Hamilton, James Lindholm, Becky Ota, Dirk Rosen, Jessica Watson, Lauren Yamane, Katie Kaplan, Melissa Monk, Christian Denny, Rachel Brooks*

**1. Assuming some kind of visual tool is used, what metrics (e.g., density, abundance, percent cover, length, biomass, recruitment events, invasive species, marine debris) allow the state to assess the performance of the MPA Network?**

**Group 1:**

- **Suggested metrics ranked by importance:**
  - 1) Density
  - 2) Biomass
  - 3) Length distribution
  - 4) Geospatial location (varying degree of resolution dependent upon tool)
  - 5) Percent cover and categorical data (Invertebrate and biogenic habitat data)

**Group 2:**

- **Suggested metrics ranked by importance:**
  - 1) Biomass – Assess response or lack of response
  - 2) Percent cover – Sessile invertebrates
  - 3) Relief – Physical and biogenic (quantitatively/categorically)
  - 4) Position – animal relative to habitat
    - Secondary metric, indicative of density changes
  - 5) Invasive species
    - Secondary information
  - 6) Marine debris
    - Secondary information
  - 7) Recruit estimates – Counting number of Young-Of-Year (YOY)
    - Secondary metric – opportunistically

**2. What level of accuracy of sizing of individuals is needed?**

**Group 1:**

- Strive for 1cm resolution – functionally as close as possible to real life
- Bin later for higher groups
- 1cm resolution needed for newer models

**Group 2:**

- No definitive answer
- Need to know precision and error of size measurements
- Transparency of tools limitations when presenting results

**3. Should recruitment be measured?**

**Group 1:**

- Identify YOY's whenever possible
  - Secondary measurement – return to video recording later

**Group 2:**

- Measure YOY clouds and attempt to count individuals
  - Secondary measurement – return to video recording later

**4. *What analytical/statistical approaches to handling the data provide the highest likelihood of detecting change?***

**Group 1:**

- **Two conflicting issues:**
  - 1) Need statistically rigorous design that may require long timelines to collect data, but will be the most defensible (rigorous regional study every few years)
  - 2) Political tension to have data quickly in order to show stakeholder that there is progress being made and that the MPAs are having some effect
- **Solution:**
  - Start sampling sites that have time series data – subset those by which sites we will see MPA effects
    - Most likely sites closer to ports and easier to sample
    - Less likely to see responses up North – potentially allocate less resources

**Group 2:**

- Randomly sample quadrats along transect
- Aggregate analysis across species
- Habitat suitability analysis – Model habitat associations and perhaps look at how particular MPA's are likely to impact fish populations based on available habitat

**5. *What is an effective yet cost efficient, frequency of sampling needed to detect significant changes over time?***

**Group 1:**

- Start sampling sites that have time series data – subset those by which sites we will see MPA effects
  - Most likely sites closer to ports and easier to sample
  - Less likely to see responses up North – potentially allocate less resources

**Group 2:**

- Subregion approach to sampling: Rotate sites within the subregion
  - Core sites – sample multiple times and consistently (not every year)
  - Ancillary sites – rotating between sites (sampled less frequently)

- All MPA's would eventually be sampled – Fisherman less likely to be angry

**Topic 4: Adaptive Management questions to address in a long-term monitoring plan: which questions would require specific studies, and which ones could be answered by any monitoring design?**

**1. What is the minimum number of MPAs that should be monitored?**

- Two different models proposed, based on \$500,000 budget:
  - 1) 6 core sites spread across regions
    - Use similar tools across all 6 sites
  - 2) Separate coast into two regions
    - Core sites sampled each year alternating between the two regions
      - 8 sites per region
      - Use cheaper tools to sample other sites within region

Note: these numbers were based on the assumption of limited available funds for monitoring, the group agreed that more funding is needed and warranted for deep-water surveys and \$500,000 is not enough to survey the entire coast annually.

**2. Are there differences in ecosystem responses based on clusters of MPAs vs. stand-alone MPAs?**

- Do clusters vs. non-clusters react differently? (A cluster of MPA's here is defined as two MPA's paired together like an SMR and SMCA next to each other)
- Won't be able to answer this question in deep water ecosystem – Doesn't make sense to design long-term study for this question

**3. What are the population effects of siting MPAs in larval source or sink locations and what are the implications for MPA siting?**

- Yes, there will be effects—need to wait for ROMS model results before discussion
  - Secondary consideration

**4. How do size, biogeographic location, the degree of protection (i.e., no-take or limited take), the life history characteristics of target species, habitat, fishing intensity outside MPAs, and environmental factors such as complex oceanographic patterns or other indirect effects affect MPA success?**

- Question Tabled – Too many components to adequately address

**5. How do ecosystem structure and function change through time and space?**

- Potentially not enough variation within biogeographic area to answer

**6. Can we design the monitoring program to monitor a wide variety of MPA sizes to evaluate the question of size vs. value? If so, what are the categories and what is the minimum replicate number to do so?**

- MPA system not designed to answer this question, not enough variation

**7. Can we design the monitoring program to sample a collection of MPAs with a range of habitat complexities and areas to evaluate the question of the value of habitat patch size? If so, what are the categories and what is the minimum replicate number to do so?**

- Habitat complexity is going to fall into place, no need to design monitoring program around habitat but rather collect data opportunistically

**8. Can we design the monitoring program to specifically answer questions about the type, amount, and reasons for spillover from MPAs to adjacent areas?**

- Separate study design/program would have better results – but could design if needed to answer question
  - Tagging provides good estimate of spillover

**9. What types of monitoring information can be used for other resource management needs (e.g., fisheries, water quality)?**

- Additional sensors applied to ROVs (ex: CTDs, etc.)
- Opportunistically collect other data to go along with primary objectives

**Closing Remarks and Timeline:**

- Next workshop (late June) – Talk methods, tools, details of the two different design models
- Shooting to have draft of action plan complete by midyear next year (12 months away)
  - RFPs, RFQs, etc. due next Fall
- Need narrative around decision points made – all tradeoffs



## APPENDIX A

*California Ocean Protection Council  
California Department of Fish and Wildlife  
Moss Landing Marine Labs*

# Agenda

## Deep-Water Marine Protected Area Monitoring Workshop

**April 19, 2017; 10:00 AM – 6:00 PM**

**April 20, 2017; 8:00 AM – 2:00 PM**

**Seminar Room**

**Moss Landing Marine Laboratories**

**8272 Moss Landing Drive, Moss Landing, CA 95039**

### Meeting Purpose/Objectives:

- Inform the development of an appropriate deep-water ecosystem monitoring framework to support statewide MPA monitoring, including monitoring of both individual MPAs and California’s MPA network. To this effect:
  - Discuss and identify the most important monitoring questions to address, including adaptive management questions
  - Identify which taxa and habitats are most important to monitor to address the monitoring questions
  - Limit the range of possible objectives related to monitoring

### **Day 1: April 19, 2017**

TIME	ITEM	PRESENTER/ MATERIALS
9:30 AM	<i>Arrivals</i>	
10:00	<b>Welcome, Objectives, and Introductions</b> <ul style="list-style-type: none"><li>• Welcome by MLML</li><li>• Introductions</li><li>• Review of meeting objectives, agenda, and ground rules</li></ul>	<ul style="list-style-type: none"><li>• Rick Starr</li><li>• Eric Poncelet</li></ul> <i>Materials: Agenda, Participant Roster</i>
10:15	<b>Background and Orientation</b> <ul style="list-style-type: none"><li>• Status of MPA monitoring in CA<ul style="list-style-type: none"><li>○ Shift from regional plans to statewide program</li></ul></li><li>• What has been accomplished to date?</li></ul>	<ul style="list-style-type: none"><li>• Cyndi Dawson, Becky Ota</li><li>• Steve Wertz</li></ul> <i>Material: PPT</i>
10:30	<b>Topic 1:</b> What does “Protecting the structure, function, and integrity of ecosystems” mean with respect to MPA monitoring?  A. Identify questions to address in a long-term monitoring plan 1. Proposed questions (discuss and confirm)	<ul style="list-style-type: none"><li>• All (plenary)</li></ul>

	<ol style="list-style-type: none"> <li>In individual MPAs across the network, do focal and/or protected species inside of MPAs stay the same or increase in size, density, and biomass relative to areas of similar habitat adjacent to and distant from MPAs?</li> <li>Do species richness and/or diversity stay the same or increase in MPAs relative to areas of similar habitat adjacent to and distant from MPAs?</li> <li>Can we monitor a series of MPAs (distributed along the coast) and consider results to be representative of the overall MPA network performance?</li> </ol> <ol style="list-style-type: none"> <li>What other ways can the state determine if MPAs are protecting the structure, function, and integrity of ecosystems?</li> </ol>	
12:15	<i>Lunch (sandwiches will be brought in)</i>	
1:15	<p><b>Topic 2:</b> Which taxa are best used to assess the performance of the CA MPA Network at protecting marine wildlife, rebuilding depleted populations and protecting the structure, function, and integrity of ecosystems?</p> <p>A. Breakout groups discuss the following questions:</p> <ol style="list-style-type: none"> <li>Which taxa are sufficiently abundant to enable statistically significant estimates of changes in the metrics identified in Appendix 1?</li> <li>Which taxa are not sufficiently abundant but should be monitored anyway, and why?</li> <li>Which of the above taxa can be used to aid in fisheries management?</li> <li>What other taxa will be surveyed in the process of monitoring the focal species?</li> <li>Are there specific taxa that occur in all parts of the MPA network and that should be monitored to enable an understanding of differences in MPA response across the state?</li> </ol>	<ul style="list-style-type: none"> <li>All (three breakout groups, by region)</li> </ul> <p><i>Materials:</i> <i>List of deep-water species for all regions</i></p>
3:15	<i>Break</i>	
3:30	<p><b>Topic 2:</b> cont.</p> <p>B. Breakout group reports back</p> <p>C. Plenary discussion: identify common themes</p>	
5:15	<b>Wrap Up and Preview of Day 2</b>	
5:30 PM	<i>Adjourn; no-host dinner at The Whole Enchilada</i>	

## Day 2: April 20, 2017

TIME	ITEM	PRESENTER
8:00 AM	<b>Overview and Reflections on Day 1</b>	
8:10	<b>Topic 3:</b> Metrics	<ul style="list-style-type: none"> <li>All (two breakout)</li> </ul>

	<p>A. Breakout groups discuss the following questions (90 min):</p> <ol style="list-style-type: none"> <li>1. Assuming some kind of visual tool is used, what metrics (e.g., density, abundance, percent cover, length, biomass, recruitment events, invasive species, marine debris) allow the state to assess the performance of the MPA Network?</li> <li>2. What level of accuracy of sizing of individuals is needed?</li> <li>3. Should recruitment be measured?</li> <li>4. What analytical/statistical approaches to handling the data provide the highest likelihood of detecting change?</li> <li>5. What is an effective, yet cost-efficient, frequency of sampling needed to detect significant changes over time?</li> </ol> <p>B. Breakout group reports back</p> <p>C. Plenary discussion: identify common themes</p>	<p>groups)</p> <p><i>Materials:</i>  <i>Proceedings of the Marine Protected Areas and Fisheries Integration Workshop</i></p>
10:30	Break	
10:45	<p><b>Topic 4:</b> Adaptive management questions to address in a long-term monitoring plan: Which questions would require specific studies, and which ones could be answered by any monitoring design?</p> <p>A. Discuss possible adaptive management questions:</p> <ol style="list-style-type: none"> <li>1. What is the minimum number of MPAs that should be monitored?</li> <li>2. Are there differences in ecosystem responses based on clusters of MPAs vs. stand-alone MPAs?</li> <li>3. What are the population effects of siting MPAs in larval source or sink locations and what are the implications for MPA siting?</li> <li>4. How do size, biogeographic location, the degree of protection (i.e., no-take or limited take), the life history characteristics of target species, habitat, fishing intensity outside MPAs, and environmental factors such as complex oceanographic patterns or other indirect effects affect MPA success?</li> <li>5. How do ecosystem structure and function change through time and space?</li> <li>6. Can we design the monitoring program to monitor a wide variety of MPA sizes to evaluate the question of size vs. value? If so, what are the categories and what is the minimum replicate number to do so?</li> <li>7. Can we design the monitoring program to sample a collection of MPAs with a range of habitat complexities and areas to evaluate the question of the value of habitat patch size? If so, what are the categories and what is the minimum replicate number to do so?</li> <li>8. Can we design the monitoring program to specifically answer questions about the type, amount, and reasons for spillover from MPAs to adjacent areas?</li> <li>9. What types of monitoring information can be used for other resource management needs (e.g., fisheries, water quality)?</li> </ol> <p>B. Overarching reflections</p>	<p>• All (plenary)</p> <p><i>Materials:</i>  <i>Master Plan for MPAs</i></p>

12:45	<b>Wrap Up and Next Steps</b>	
1:00 PM	<i>Adjourn</i>	

**Meeting Materials:**

1. Agenda
2. Roster of participants
3. List of deep-water species for all regions
4. Master Plan for MPAs (key sections: Chapter 4, Appendix A, pp A32-A37)
5. Proceedings of the Marine Protected Areas and Fisheries Integration Workshop, 2011 (key sections: tables on pp. 20-52)

*California Ocean Protection Council  
California Department of Fish and Wildlife  
Moss Landing Marine Laboratories*

## Meeting Summary

### Deep-Water Marine Protected Area Monitoring Workshop

June 26, 2017; 10:00 AM – 6:00 PM  
June 27th, 2017; 8:00 AM – 2:00 PM  
Seminar Room  
Moss Landing Marine Laboratories  
8272 Moss Landing Drive, Moss Landing, CA 95039

**WORKSHOP ATTENDEES:**

Mark Carr	UCSC
Cyndi Dawson	OPC
Christian Denney	MLML
E.J. Dick	NMFS
Ryan Fields	MLML
Mary Gleason	TNC
Katie Kaplan	OPC
Andy Lauermann	MARE
James Lindholm	CSUMB
Steven Morgan	UCD
Nick Perkins	OPC
Eric Poncelet	Kearns & West
Michael Prall	CDFW
Dirk Rosen	MARE
Rick Starr	MLML
Brian Tissot	HSU
Vicky Vasquez	MLML
Jimmy Williamson	MLML
Lauren Yamane	OPC

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## Introduction and Overview

The California Ocean Protection Council (OPC), the California Department of Fish and Wildlife (CDFW), and Moss Landing Marine Laboratories (MLML) hosted a two-day workshop in Moss Landing on June 26<sup>th</sup> – 27<sup>th</sup> to continue developing a strategy for the long-term monitoring of deep-water marine protected areas (MPA) in California. Experts from across the state were involved in discussions and breakout sessions to identify viable tools and sample designs that would meet the State’s objectives.

The state of California is shifting from short-term MPA baseline monitoring projects to long-term MPA monitoring programs across the entire MPA network. While no funding has been guaranteed for this program, OPC staff has indicated there is a maximum \$4 million funding that could be available from the State to survey all habitat types along the California MPA network. In order to maximize the effectiveness of available funding, the OPC asked MLML to set up two workshops to inform the development of an appropriate deep-water ecosystem monitoring framework to support statewide MPA monitoring, including monitoring of both individual MPAs and California’s MPA network. The objectives of the first workshop were to a) discuss and identify the most important monitoring questions to address (including adaptive management questions) and b) to identify which taxa and habitats are most important to monitor to address the monitoring.

The objectives of this second workshop were to a) discuss various tool and analytical technique combinations for conducting deep-water MPA monitoring b) articulate the tradeoffs between different approaches, and c) provide the State with tool and MPA recommendations for long-term monitoring of deep-water habitats. Similar to the first workshop, both plenary and break-out sessions were established and facilitated by Eric Poncelet (Appendix 1). After a recap of the first workshop, there were two presentations about sampling statistics based on baseline ROV monitoring data and a study comparing data from a ROV and a video lander. The first two breakout sessions included discussions of various tool and study design technique combinations for conducting deep-water MPA monitoring. A third breakout session was scheduled to discuss “various image analysis, data analysis and statistical techniques for evaluating spatial and temporal changes in deep water MPAs”. This discussion was largely postponed for another workshop, however, as attendees agreed that it would be more important topic to discuss and recommend specific MPAs along the coast for long-term monitoring.



## Summary of Day 1 Discussions

### Presentations:

Nick Perkins (OPC/CDFW): Spatial Point Process Modeling.

Spatial Point Process modeling techniques allows spatial structures for individual fish to be modeled for a given location and provides a powerful way to explore sampling designs. This technique also allows spatial-autocorrelation to be explicitly accounted for within the model. By using baseline ROV data collected by CDFW for three species (Brown, Canary, and Yelloweye Rockfish) near Bodega Bay, Nick demonstrated how the coefficient of variation (CV) was reduced with increased sample size (number of ROV transects). A fixed transect width was used, but future modeling could be developed into a more sophisticated model (e.g., distance sampling). Similarly, environmental covariates can be included in the model to understand statistical associations between fish density and habitat variables. While a scarcity of data associated with some species can lead to high model uncertainty, spatial point process models may be useful as a power analysis to decide final sampling design for the deep water MPA monitoring program.

Christian Denny (MLML): Live-feed Video Lander vs. Remotely Operated Vehicle (ROV)

ROVs transects may survey large areas, but often have relatively few replicates. Drop cameras on the other hand survey much smaller areas, but can achieve higher sample sizes due to ease of deployment. There is an order of magnitude difference in the average area surveyed between the live-feed, drop camera tool (Stereo Video Lander) and MARE's ROV "Beagle", which has implications on sampling effort needed. Analysis revealed that the Lander did not obtain significantly different density estimates for species groups than the ROV tool. This indicates that the Lander may be a viable survey tool for the long-term deep water MPA program and may only require moderate sampling effort to achieve low CV. Because ROVs can cover a much broader area, they may be more appropriate in locations where habitats are patchy or poorly mapped in MPAs. Conversely, where substrates are well mapped and relatively uniform, Video Lander tools can do a good job of quickly and accurately surveying large areas.

### Breakout Session 1

- Identify how alternative tool and technique combinations fit the deep-water monitoring goals articulated in workshop #1
- Describe the tradeoffs between different tool-technique combinations
- Discuss best practices for
  - Tools: **Mini-ROV, ROV, and HOV**
  - Techniques: Strip transects, line transects, photo quadrats

### Mini-ROV

There was as strong consensus that Mini-ROVs (e.g., Seabotix) would be an inappropriate tool for answering primary questions and monitoring objectives. These small ROVs are a 'glorified drop camera' and are severely limited by depth (~70 m) and ocean currents. Because of these limitations,

standardization and replication would be difficult with the mini-ROV across a broad range of typical oceanographic conditions. This tool theoretically could obtain the desired metrics across a variety of study designs; however, data are likely to be coarse compared with tools like ROVs or stereo drop cameras. Due to their small size, mini-ROVs have significant constraints in their instrumentation payload, and are unlikely to be equipped with stereo-cameras. Current iterations of this tool do not have any sizing capabilities, making area-swept and fish density estimates extremely difficult or impossible. Despite these shortcomings, the mini-ROV is relatively cheap, can be deployed from any vessel, provides high sample sizes, and only requires a car battery for power. Therefore this tool may have some use as an opportunistic sampling tool.

### **Remotely operated vehicle (ROV)**

Discussion was limited to mid-sized, observation-class ROVs like the Phantom or Beagle. ROVs are well equipped to conduct any of the survey types outlined (strip transect, line transect, point counts, and photo quadrats) and collect all desired metrics agreed on at the first workshop (biomass, density, length, percent cover). ROVs are capable of depths to 1000 m, and are stable in a variety of oceanographic conditions. Because typical cruising speed is 1.5 – 2 kt, ROVs are capable of covering much larger areas and will better detect rare species compared with a point count survey. Video collected by ROVs could be archived and allow for detailed post-processing. Additionally, archived video may allow future state research objectives to be met post-hoc. Each ROV transect will cover a greater area compared with drop-camera techniques, but this comes at the cost of fewer replicate transects, and possibly less of the overall MPA being surveyed. While fixed transects may be possible with an ROV, there was a consensus that a randomized survey design be implemented. Nonetheless, a relatively short transect length and multiple transects may be important to increase statistical power. Line transects methods are possible with ROVs, however there was agreement that if ROVs are chosen for monitoring, they would be better used to conduct strip transect surveys because that would provide more information for a greater number of species.

There was a discussion of extrapolating ROV densities to abundance estimates. The consensus was that there will need to be an agreed-upon method to define the survey area to accurately extrapolate to abundance. This may mean defined transect lengths, or an agreed-upon method of subsampling a longer transect. Similarly, it will be important to decide a consistent instrumentation (stereo-cameras, altimeter, depth etc.) for the ROV tools used along the coast.

The main drawbacks to using an ROV are: cost for ship time, costs for post processing of video and greater personnel and training needs to operate. If there are time or financial constraints, archived video can always be randomly subsampled. Observation-class ROVs would require vessels at least 50 ft in length, which limits number of available ships along the coast. There was some concern about fish attraction and/or avoidance to ROVs, though this would not be a concern if the State was interested in relative indexes of abundance. If point counts were the desired survey technique, then ROVs would be an impractical tool. Similarly, while photo-quadrat type data could be extracted from HD video, the ROV is possibly 'overkill' for a photo-quadrat study and there are no practical means to have fixed photo quadrats for repeated sampling. There were also some concerns that if canyons were selected for surveys, a separate set of protocols would be needed to operate the ROV in those steep environments.

Two main techniques for operating ROVs were discussed: ‘High-and-Fast’ vs ‘Low-and-Slow’.

- High-and-Fast surveys are conducted approximately 1 m off the bottom, and at a maximum speed of 1.5-2 kt. This speed allows much larger areas to be surveyed per each transect. Traveling fast is in some cases easier for the boat operator, but may not be possible in low-visibility conditions. High-and-Fast will allow more ground to be covered in a day. Video ID will contain greater proportions of unidentified rockfishes when traveling fast – compromising the overall quality of data.
- Low-and-Slow is conducted ~20 cm off the bottom and slower (~0.5 kt). This technique may have larger operating windows environmentally because operators will be able to avoid obstacles in turbid water conditions. The Low-and-Slow design will capture the same data that was captured using ‘High-and-Fast’, and may lead to higher proportions of fish ID’d. A continuous transect design with Low-and-Slow piloting could also cover a large area within a day.
- Note that a third technique that has been used in submersible surveys was not discussed for ROVs. In submersible surveys that have occurred in California, the vehicle has been operated ~0.5-1 m off the bottom and has been driven at a speed of 0.5-1 kt. This technique has been used with randomly located transects of about 200-300 m in length.

### Human Operate Vehicle (HOV)

HOVs were considered slightly better, but similar to ROVs with respect to the type and quality of data obtained. HOVs have the benefit of a human observer, who can annotate all video collected and better ID small fish. Because small fish are not the focus of this long-term monitoring program, this difference may not be important. HOVs require specialized training, can have limited availability, and require larger vessels to carry and deploy than ROVs. HOVs are more expensive to operate than ROVs and cover less distance – limiting sample size (number of transects). If this tool were selected, a strip-transect design would be implemented, and distance-sampling techniques would facilitate more accurate estimates of density and biomass. Line-transect and photo-quadrat surveys could be obtained from archived video as was the case with the ROV. This tool has proven itself capable of collecting excellent data, but financial constraints and limited availability of HOVs may favor the use of ROVs.

### ROV Sample Design Considerations

After discussing the merits and shortcomings of available tools, workshop attendees focused on the questions “*How will we design a study with an ROV?*” and “*What will our sample unit be?*” It was agreed that a strip transect method would be used with the ROV because this technique would collect the most data for a given effort. Archived high-definition (HD) video would allow other sampling designs (e.g., random photo quadrats) to be conducted post-hoc. Stereo-video should be used to make length measurements because a relatively small number of fish (several hundred) need to be sized in order to characterize the population size structure. Additionally, lengths estimated by lasers have been shown to be biased at the smallest and largest size classes of fishes. The costs associated with stereo-

camera equipment and post-processing are not prohibitive and are comparable to the effort expended using lasers.

There was disagreement on whether the sample unit should be a transect or a sub-sample of a transect, such as in non-overlapping photo quadrats. Some attendees felt it may be inappropriate to use small quadrats to sample fish counts in deep-water, rocky reef habitats because they may result in a high number of zero counts. Existing statistical methods to deal with zero-inflated data are imperfect; therefore, it is important that sample unit be at the scale of the distribution of the target organism. Photo quadrats may be most appropriate for quantifying habitat across a survey area. The final sample design should be evenly applied to all MPAs surveyed along the CA coastline under the assumption that the data will be post stratified during analysis.

A typical ROV survey considers the sample unit to be each transect. Fixed-length transects are randomly placed across the study area. One recent study (Lindholm et al. 2015) had success in flat, soft-bottom habitat using a continuous ROV transect design. These long transects were subsequently subsampled post-hoc (as photo quadrats) to increase both sample size and statistical power. A long transect could be logistically favorable as it minimizes the number of ROV retrievals and deployments needed for a given survey, thereby maximizing sampling effort in a given day. Some workshop attendees objected that subsampling a long transect this way was arbitrary and may amount to ‘pseudo-replication’, and thus not properly address the issue of spatial autocorrelation. Although spatial-autocorrelation is unlikely to be eliminated from any study, some sample designs will better minimize spatial autocorrelation. Similarly, some modeling techniques may be able to account for some spatial-autocorrelation in the data, but likely do not capture the true scale of auto-correlation present.

Ultimately, the State is interested in a robust sample design along the entire network of MPAs. Tradeoffs likely exist between sampling a single MPA with a long transect versus spreading smaller randomly placed transects across a greater number of MPAs. It was unclear what additional benefits would be gained by using the long transect sample design. Ultimately the group did not agree on what an appropriate ROV sample unit should be. A proposal was made to review previous ROV sampling methods and layout 2-3 methods that have been used successfully.

## Breakout Session 2

Discuss second set of tool and study design technique combinations for conducting deep water MPA monitoring.

- Identify how alternative tool and technique combinations fit the deep-water monitoring goals articulated in workshop #1
- Describe the tradeoffs between different tool-technique combinations
- Discuss best practices for
  - Tools: **Drift Camera, towed cameras, sled cameras, live-feed landers, drop cameras**
  - Techniques: Strip transects, line transects, photo quadrats

## **Towed Cameras**

The use of a towed camera would be most appropriate for rapidly surveying habitat or geology types and less suitable for fish density estimates. Towed cameras have depth limits of approximately 200 m, but can be consistently operated across a range of current speeds. Tow speeds range between 1-3 kt allowing for larger survey areas in a given day compared with drift or drop cameras. Relatively small boats (20- 30 ft) can operate towed camera sleds. The cost of building and operating these tools is cheaper than a typical ROV, and towed cameras can be equipped with a similar array of sensors and instruments as a ROV. Strip transects and photo quadrat survey designs are attainable with towed cameras, though maintaining a consistent quadrat area would be challenging. Similarly this tool can be difficult to navigate in high-relief, rocky habitat – ultimately leading to sections of poor quality data. Newly developed towed camera systems have more sophisticated controls to navigate medium relief terrain, but these tools require more expertise to operate. Towed cameras also have coarse positional accuracy, which makes fine-scale habitat associations difficult. Additionally, it has been shown that some fish avoid the approaching cable of the towed camera system – a behavior that could compromise fish density estimates.

## **Drifting Cameras**

A drift camera (e.g., Woods Hole Oceanographic Institute’s SeaBOSS), is weighted and hangs below the vessel. Rather than being towed, it would drift with the boat passively, or with some small directional inputs from the vessel. As such, less area is surveyed than a towed camera system, though drifting cameras are much quieter and may have less fish avoidance issues. A simple winch system and live-feed video allows this tool to be hoisted over rugose habitat and maintain a constant distance from the seafloor. Drifting cameras would be compatible with stereo-camera systems and could attain the necessary precision in size estimates. Because this tool is approximately straight below the ship of operation, position could be easily triangulated with a pinger. Current implementations of drift camera tools are large in size and require vessels with an A-frame; however, future iterations could be built smaller to accommodate medium sized ships-of-opportunity.

## **Benthic Sled**

While benthic sleds have been used successfully in previous studies of low-relief habitat, this tool was quickly decided against because contact with the seafloor may damage sensitive habitat. When bottom contact is not an issue, benthic sleds perform well in strong current conditions, and are not depth limited. Sleds are generally cheaper to build and operate than ROVs, but this can be variable depending on the instrument configuration. Vessel requirements are the same as towed cameras—allowing for a greater size range of vessels to be used. Replication is easily achieved with this tool; however, density estimates can be difficult to obtain accurately because maintaining a constant depth over rocky habitat is challenging. Altimeter sensors can alleviate this concern somewhat. Overall, this tool is best suited for soft bottom habitat.

## **Drop Cameras**

Drop cameras have been used globally to successfully quantify relative indexes of fishes. When equipped with stereo-cameras, drop cameras can achieve accurate density and biomass estimates. Drop

cameras are relatively cheap to build and maintain, and many are lightweight enough to be deployed off any vessel size class. Some have been deployed independent of the ship, while others remained tethered. This type of tool is suitable for photo quadrat and point count type surveys only. Because there is no live-feed to the surface, it is likely that a certain percentage of surveys would need to be excluded due to misplacement of the drop camera, or the camera system tipping over in high-relief habitat. Additionally, there may be higher zero counts with a drop camera, in part because of the imprecise spatial deployment, and partially because the area surveyed is relatively small when compared with a towed camera, ROV, or HOV. Subsurface recording of video translates into greater topside download times. Because these tools can be so quickly deployed over a large area, the cumulative benefits may outweigh some of the logistical concerns and the cost of excluding a portion of the surveys.

### **Live-feed Drop Cameras**

Live-feed drop cameras have the additional benefit of monitoring the survey in real time. These cameras can be placed with much greater positional accuracy on the bottom compared to blind drop cameras, and can be righted if tipped over – reducing the amount of data excluded post sampling. Additionally, the live-feed allows the operator to verify that the survey is being conducted in the targeted habitat type, further reducing wasted effort. To date, the live-feed camera systems have been approximately 200- 300 lb and require a medium-sized vessel and winch to deploy. While not depth limited for the purposes of this long-term monitoring project, the umbilical tether creates a logistical challenge, as it can be difficult for a vessel to hold station over the camera. Live-feed drop cameras are more expensive to build than their blind counter parts (\$80-100K total cost), but are still considerably cheaper than ROV type tools. Live feed drop cameras are stereo-camera compatible and can be equipped with a broad array of additional sensors. Current iterations of this tool record video subsurface and require downloading at the surface. Future iterations of live-feed drop cameras will be designed to minimize time on bottom, allow HD topside recording, and alleviate other logistical concerns with deployment. Less area is surveyed per deployment of the drop camera, which may lead to zero inflated data; however, a greater spatial coverage of the MPA might be surveyed with this tool since replicates are easily obtained. Live-feed drop cameras would be used with a stratified random point survey to adequately cover all depths and habitats within each MPA of interest.

## **Summary of Day 2 Discussions**

### **MPA Selection: Which MPAs should be sampled?**

Attendees postponed the discussion of sample design, video analysis, and statistical methods until a future date. Instead, workshop attendees decided that their time was better-spent reviewing individual MPAs along the coast in order to recommend a short list of priority MPAs that should be monitored. Experts attending the workshop used personal experience and the general criteria listed below to select priority MPAs along the coast. Note that the moderators recommended that bolded items be weighed

more heavily during the decision making process. The proposed long-term monitoring program should prioritize the representativeness of an MPA to the broader coastline over the availability of previous survey data for that MPA. Additionally, MPAs should also be selected to represent and span important biogeographic features along the coast. Because there are many definitions of biogeographic regions and the MLPA regions are not based strictly on biogeography, the group suggested that selection of MPAs to be monitored should not be constrained by the MLPA management regions as currently drawn on the map.

- **Representativeness** (depth, habitat, community composition, biogeographic region)
- **Focus on State Marine Reserves (SMR) or functional equivalent**
- **Feasibility and Practicality** (this includes cost)
- **Practicality**
  - Species richness and diversity
  - Historical fishing pressure data
  - Existing time series of sample data
  - Presence of appropriate reference area
  - Expected recovery from fishing pressure
  - Amount of rocky reef available

### Selection of Priority MPAs

Nineteen MPAs were selected as being preferred for a robust sample design during the first part of the discussion. Thirteen of these MPAs were agreed upon as the minimum level of sampling that could be confidently recommended for the long-term deep water MPA monitoring program. Below the MPAs listed as “*Tier 1*” represents the minimum 13 MPAs recommended by the workshop attendees. The additional six MPAs listed as “*Tier 2*” make up the rest of the 19 MPAs that are the preferred coast-wide sample design.

### Proposed high-priority Survey sites (North to South)

**Pt. St George SMCA:** *Tier 1*. This MPA is accessible and historically had instances of Yelloweye Rockfish (*Sebastes ruberrimus*) – a species of management concern.

**Sea Lion Gulch SMR:** *Tier 2*. This MPA has a high level of species richness and the largest continuous reef structure in the north, but is small and difficult to access.

**Ten Mile SMR:** *Tier 1*. This MPA is accessible and overlaps existing SCUBA survey sites which could be useful for comparison. Other survey data exists here.

**Pt Arena SMCA/SMR:** *Tier 2*. There is high species richness here, although this MPA is difficult to access (no nearby ports, rough conditions etc.). This site is of high interest since it neatly divides the north vs north-central regions of the California coastline. A time series of data exists for Pt. Arena. This site may be most appropriate to the north biogeographic region.



**Bodega SMCA/SMR:** *Tier 1.* Accessible. Large area of reef and historic time series of survey data.

**SE Farallon Islands SMCA/SMR:** *Tier 1;* This MPA contains abundant rocky reef habitat with high fish abundance and a large amount of data on both fish assemblages and fishing pressure in the area.

**Portuguese Ledge SMCA:** *Tier 2.* This MPA represents a unique rocky ledge feature in Monterey Bay, associated with the continental slope and historically has been a site of high fish abundance. Also, it has been studied extensively.

**Pt Lobos SMCA/SMR:** *Tier 1.* This MPA is relatively easy to access, representative of central coast species, contains unique geology, and has abundant deep rock habitat. There are lots of previous data from Point Lobos, and suitable reference sites.

**Pt Sur SMCA/SMR:** *Tier 1.* Relatively accessible and representative of central coast species. There is abundant deep rock habitat, lots of previous data, and suitable reference sites. Point Sur met the matrix criteria more strongly than Big Creek for this region of the coastline.

**Piedras Blancas SMCA/SMR:** *Tier 1.* Piedras Blancas contains extensive deep rocky habitat, has a high diversity of fish species, and may contribute more to connectivity than Point Buchon SMR.

**Pt. Conception SMCA/SMR:** *Tier 2.* Point Conception is an important biogeographic break that separates central and southern California. The rocky reefs here are small but very important to local species. Unusual tar seeps.

**Harris Point SMR:** *Tier 1.* Harris Point has abundant rocky reef habitat with high fish abundance, and is logistically more feasible to sample than Richardson Rock SMR on San Miguel Island. There are large amounts of data on fish assemblages and fishing pressure in the area.

**South Point SMR:** *Tier 2.* South Point SMR has ample rocky reef habitat with high fish abundance, large amount of data on fish assemblages and fishing pressure in the area.

**Gull Island SMR:** *Tier 1.* A good time series of data exists for Gull Island SMR, and this site is relatively protected from inclement weather. It may be more difficult to establish a representative reference area; however, heavy fishing in the areas adjacent to the SMR may lead to larger temporal differences inside/out of the MPA.

**Anacapa Is. SMCA/SMR:** *Tier 1.* Anacapa has plenty of deep rock habitat, lots of previous survey data, detailed benthic maps of the area, and a strong record of fishing pressure in the area.

**Footprint SMR:** *Tier 1.* Footprint SMR is similar to Anacapa but has rocky reef at greater depths (100+ m). There are lots of reference sites, and 10-15 years of historical data available from Milton Love.

**Farnsworth SMCA:** *Tier 2.* Farnsworth is the only MPA on Catalina Island with significant deep rocky reef, and has somewhat unique characteristics as an offshore bank with deep sea corals. It may be difficult to locate an adequate reference site for Farnsworth SMCA. Additionally, some pelagic fishing effort in this reserve may make future across-MPA comparisons statistically difficult

**San Clemente Island:** *Tier 1.* This area has been a de-facto reserve for ~40 years due to the US Navy's use of the island and water space.

**S. La Jolla SMCA/SMR:** *Tier 1.* This is one of the only MPAs suitable in the San Diego region. This MPA is representative of southern region habitat and fish assemblages and has plenty of reef available to survey.

### How to Sample the MPAs?

Consistency in sample design will be needed so that data are comparable across the MPA network. This may not necessarily require the same tool to be used across the state, but the data must ultimately be comparable across MPAs. It was agreed that each MPA may require a different amount of sampling to adequately characterize fish populations and detect changes through time. This is in part due to inherent variability in both species abundances and habitat availability. Some reefs, such as those at Ten Mile SMR, will be sampled in their entirety, whereas other, larger MPAs will need to be stratified and subsampled for both habitat and depth. MPAs need to be surveyed across the range of depths that species are distributed with at least two samples from each depth strata. In order to extrapolate density and biomass estimate to a larger area (i.e., the entire reef structure or MPA), stratified sampling must be conducted over representative habitat. It is ok for random sampling to include non-rock features like sand channels so long as these are representative of the broader MPA, but large, non-representative soft bottom features should be avoided for this long-term program.

Although a final transect design was not agreed upon, it was suggested that transects start off the rocky reef habitat and move onto the reef in order to capture the important transition zone between sand and rock. Still to be decided was whether the entire reef within an MPA should be stratified and sampled, or whether smaller portions of the reef should be selected as representative of the entire MPA. The latter design would allow more intense sampling at smaller scales as opposed to spreading sampling over a larger area. The down side to this type of sampling is that spatial variation is not sampled, so differences observed over time can only be attributed to that site and not the entire MPA. Because the representativeness of a subsample is crucial to the extrapolation of density and biomass estimates, there was a consensus that accurate geo referencing of a tool is needed to match sample data with habitat data. It was therefore agreed that the accuracy and accuracy and precision of navigational equipment should be as accurate as possible. Finally, as technology improves through time after sampling begins, data will be collected according to lowest resolution capabilities. This will ensure data remains comparable throughout the duration of this long-term monitoring program.

### Future Tasks

There were numerous statistical and sample design considerations that were not fully agreed upon. There was a consensus however that existing data should be used when possible to provide guidance with respect to a final sample design. Questions the group thought should be investigated included:

*"Exactly how precise do we need our size estimates to be?"* Existing data can be used to answer this question by looking at how biomass estimates are changed by grouping size estimates into coarser bins.

If there are cost/benefit tradeoffs between sizing with stereo cameras versus lasers, this analysis may help the final decision.

*“How much sampling is needed, at a single MPA, to detect an effect through time?”* There is concern that intense sampling may be required in each MPA to detect change through time, which may in turn severely limit the number of MPAs sampled along the coast. A simulation with existing data will help answer this question. This power analysis is needed in order to realistically set out a sampling design along the coast.

*“How much sampling is needed by each tool to get the same CV for a given metric?”* It may also be possible to evaluate the quality of baseline data to inform which tool will be most appropriate for a long-term study. It may be necessary to weigh the relative benefits of a tool that minimizes the CV of density estimates versus a tool that minimizes CV of length estimates. Length-weight ratios are a tight relationship, and it is likely that the variability in biomass estimates is most influenced by variability in the *density* estimates as opposed to length estimates. Another consideration is the relative amount of effort needed to reduce the CV of either density or length estimates. A cost-prohibitive amount of additional sampling may be needed to reduce density estimate CV, whereas only modest amount of sampling may be required to reduce associated CV in length measurements. This is a question that could also readily be explored with existing data.

Another workshop will likely be needed to decide final sample design and statistical considerations. The results from the analysis above will inform that workshop. Additionally, several other topics will need to be finalized. The final sample unit for an ROV study was not agreed upon during this workshop. A suggestion was made to review the literature and to discuss 2-3 previously used ROV techniques in more detail at a future workshop. It was agreed that previously used ROV techniques could be modified for this long-term program if necessary so long as the techniques were applied consistently across the state. A variety of additional statistical concerns will need to be fully addressed including spatial-autocorrelation and pseudo-replication. There also was no discussion comparing the results of the first breakout session (ROV was the preferred tool) with the final results of the second breakout session (live-feed drop camera was the preferred tool). There seemed to be a consensus was that ROV would ultimately be a tool used, but further discussion may be warranted on the feasibility of a hybrid study design with both ROV and live-feed drop cameras. The final sample-design recommendation could be presented as tiered stages based on funding availability. This would allow the State to evaluate the quality and scope of data it could expect given a set of budget restrictions.

## Final Statement

Deep water rocky habitats are unique and more likely to show an MPA effect than some other habitats, such as beaches, and thus are key habitats to monitor. Surveying deep water MPAs will be cost intensive, but this is in part due to their expanse along the coastline. Shallow MPAs and areas closer to shore are much more likely to be taken advantage of by opportunistic sampling and citizen science programs, leaving the deep water habitat in need of more funding for experts, vessels, and use of visual survey tools.

There was a consensus that the 19 MPAs (Tier 1 and Tier 2) outlined are part of a preferred long-term monitoring program for deep water MPAs. These 19 MPAs span the important biogeographic features along the coast of California. The 13 MPAs listed as “Tier 1” represents the minimum number of MPAs that should be sampled in a long-term monitoring program. MPAs ultimately selected for the long-term program should be representative of the important biogeographic features along the coastline.

ROVs and/or live feed Video Landers equipped with stereo-cameras, or a combination of the two tools, are the preferred tools to use in a long-term program. A strip transect design or point counts would maximize data collection and facilitate the objectives of tracking changes in lengths, density, and biomasses of selected fishes through time. There was a consensus that stereo video should be used to collect length estimates within the precision guidelines, and that efforts should be made to reduce the CVs in density estimates.

Although final sample design logistics still need to be decided upon, it was agreed that consistent sampling techniques will need to be applied across the state. Additionally, habitat and depth should be stratified so that subsamples within an MPA represent the larger reef structure. Similarly at least two samples per depth/habitat strata are preferred. Because there will be a review of the MPA program in 2022, it is recommended that sampling be conducted annually, as soon as possible. Each MPA should be paired with an adjacent reference site and sampled annually.

## Appendix 1

**California Ocean Protection Council  
California Department of Fish and Wildlife  
Moss Landing Marine Labs**

## Agenda

### Deep-Water Marine Protected Area Monitoring Workshop 2

**June 26, 2017; 10:00 AM – 5:30 PM**

**June 27, 2017; 9:00 AM – 12:00 PM**

**Moss Landing Marine Laboratories**

**8272 Moss Landing Drive, Moss Landing, CA 95039**

***Meeting Purpose/Objectives:***

- Discuss various tool and analytical technique combinations for conducting deep-water MPA monitoring
  - Identify benefits and drawbacks
  - Articulate the tradeoffs between different approaches
- Describe the implications of using different tool and technical combinations for study design
- Describe how particular data gathering approaches are related to analytical approach

**Day 1: June 26, 2017**

TIME	ITEM	PRESENTER/ MATERIALS
9:30 AM	<i>Arrivals</i>	
10:00	<b>Welcome, Objectives, and Introductions</b> <ul style="list-style-type: none"> <li>• Welcome by MLML</li> <li>• Introductions</li> <li>• Review of meeting objectives, agenda, and ground rules</li> </ul>	<ul style="list-style-type: none"> <li>• Rick Starr</li> <li>• Eric Poncelet</li> </ul> <i>Materials: Agenda, Participant Roster</i>
10:15	<b>Background and Orientation</b> <ul style="list-style-type: none"> <li>• 2015 MBARI Visual Tools Workshop</li> <li>• CBNMS 2016 Benthic Survey Workshop</li> <li>• Deepwater MPA Workshop #1 results</li> <li>• Spatial Point Process Model</li> <li>• Comparison of ROV and Video Lander approaches</li> </ul>	<ul style="list-style-type: none"> <li>• Rick Starr</li> <li>• Nick Perkins</li> <li>• Christian Denney</li> </ul> <i>Materials: Workshop Reports, Tools Spreadsheet, Intro PPT</i>
11:00	<b>Breakout Session 1:</b> Discuss various tool and study design technique combinations for conducting deep-water MPA monitoring. <u>Discussion topics:</u> <ul style="list-style-type: none"> <li>• Identify how alternative tool and technique combinations fit the deep-water monitoring goals articulated in Workshop #1</li> <li>• Describe the tradeoffs between different tool-technique combinations</li> </ul> <p>Each group will discuss <i>best practices</i> for use of the following tools with the following techniques:</p>	<ul style="list-style-type: none"> <li>• 3 breakout groups (all with same assignment)</li> </ul>

	<ul style="list-style-type: none"> <li>Tools: a) Mini-ROV, b) ROV, and c) HOV</li> <li>Techniques: a) strip transects, b) line transects, c) photo quadrats</li> </ul>	
12:30	<i>Lunch (sandwiches will be brought in)</i>	
1:30	<b>Reports Back and Discussion</b>	<ul style="list-style-type: none"> <li>All</li> </ul>
2:30	<i>Break</i>	
2:45	<p><b>Breakout Session 2:</b> Discuss various tool and study design technique combinations for conducting deep-water MPA monitoring. <u>Discussion topics:</u></p> <ul style="list-style-type: none"> <li>Identify how alternative tool and technique combinations fit the deep-water monitoring goals articulated in Workshop #1</li> <li>Describe the tradeoffs between different tool-technique combinations</li> </ul> <p>Each group will discuss <i>best practices</i> for use of the following tools with the following techniques:</p> <ul style="list-style-type: none"> <li>Tools: a) Towed cameras, b) Sleds, c) Live-feed Landers, and d) Drop Cameras</li> <li>Techniques: a) Strip transects, b) Photo quadrats, c) Point counts</li> </ul>	<ul style="list-style-type: none"> <li>Same 3 breakout groups</li> </ul>
4:15	<b>Reports Back and Discussion</b>	<ul style="list-style-type: none"> <li>All</li> </ul>
5:15	<b>Wrap Up and Preview of Day 2</b>	
5:30 PM	<i>Adjourn; no-host dinner at The Haut Enchilada</i>	

**Day 2: June 27, 2017**

TIME	ITEM	PRESENTER
9:00 AM	<b>Overview and Reflections on Day 1</b>	<ul style="list-style-type: none"> <li>Eric Poncelet</li> </ul>
9:15 AM	<p><b>Plenary discussion:</b> Discuss various image analysis, data analysis, and statistical techniques for evaluating spatial and temporal changes in deep-water MPAs</p> <ol style="list-style-type: none"> <li>What is the best way to do image analysis?</li> <li>What is the best way to do data analysis?</li> <li>What are the best statistical techniques to allow change detection?</li> </ol>	<ul style="list-style-type: none"> <li>All</li> </ul> <p><i>Materials: CBNMS 2016 Benthic Survey Workshop, Intro PPT</i></p>
10:45	<i>Break</i>	
11:00	<b>Discuss trade-offs between monitoring a few MPAs intensively vs monitoring many MPAs less intensively</b>	<ul style="list-style-type: none"> <li>All (plenary)</li> </ul>
11:45	<b>Wrap Up and Next Steps</b>	<ul style="list-style-type: none"> <li>Rick Starr</li> <li>Eric Poncelet</li> </ul>
Noon	<i>Adjourn</i>	

**Meeting Materials**

- Agenda
- Workshop Roster of Participants
- Deep-water MPA Monitoring Workshop 1 outcome: List of goals for deep-water MPA monitoring
- MBARI Visual Tools Workshop - spreadsheet of tools
- MBARI Visual Tools Workshop - Report
- Cordell Bank National Marine Sanctuary 2016 Benthic Survey Workshop – Report
- List of relevant academic studies/articles



Appendix F:

**INDEX SITE SELECTION -  
DETAILED METHODS**



## Criteria 1: Marine protected area (MPA) design features

During the Marine Life Protection Act (MLPA) planning process, the MLPA Science Advisory Team (SAT) provided regional stakeholders with MPA science and design guidelines based on the best readily available science (CDFW 2008, MLPA SAT 2008, 2009, 2011). Regional stakeholder groups were advised to prioritize these guidelines in their design of MPAs; however, the MPAs proposed and eventually adopted vary in their level of compliance with SAT guidelines (Gleason et al. 2013, Saarman et al. 2013, CDFW 2016).

MPAs that meet scientific guidelines are expected to realize more significant conservation benefits, and therefore should be prioritized for long-term monitoring. To that end, coastal and island MPA sites were scored against SAT guidelines (MPA size, threshold of habitat representation and replication within an MPA), and overlap with Areas of Special Biological Significance (ASBS) and historically protected areas. For more information on methods for scoring estuary MPAs, see appendix F, page 220.

### MPA size

The SAT recommended that “for an objective of protecting adult populations, based on adult neighborhood sizes and movement patterns, MPAs should have an alongshore span of 5-10 kilometers (3-6 statute miles [sm]) of coastline, and preferably 10-20 km (6-12.5 sm)” (CDFW 2008). The SAT also recommended that MPAs extend from intertidal to offshore areas in order to a) protect the diversity of species that live at different depths and b) accommodate the movement of individuals to and from shallow nursery or spawning grounds to adult habitats offshore. The recommended offshore span is from the mean high tide line to the offshore state waters boundary, generally a distance of 3.45 sm (three nautical miles), except in some areas such as offshore rocks where state boundaries may extend farther. Taking into account these two guidelines, the SAT recommended a minimum area of 9 square statute miles (sm<sup>2</sup>) for each MPA, and preferably 18 sm<sup>2</sup> or larger.

Based on these recommendations, each MPA was scored for size as follows: two points if its size is greater than or equal to 18 sm<sup>2</sup>; one point if its size is greater than or equal to nine sm<sup>2</sup> and less than 18 sm<sup>2</sup>; zero points if its size is less than nine sm<sup>2</sup>.

### Threshold of habitat representation and replication within an MPA

The SAT recommended that “for an objective of protecting the diversity of species that live in different habitats and those that move among different habitats over their lifetime, every ‘key’ marine habitat should be represented in the MPA Network” (CDFW 2008). The key marine habitats described in the MLPA were subdivided by the SAT to reflect ecological differences at different depths. Twelve different habitats were classified and their spatial distribution within the MPAs was calculated. These habitat summaries include: rocky shores, hard bottom 0-30 meters (m), hard bottom 30-100 m, hard bottom 100-3000 m, beaches, soft bottom 0-30 m, soft bottom 30-100 m, soft bottom 100-3000 m, kelp, coastal marsh, eelgrass, and estuary.

The SAT also recommended that each of the above habitats be replicated within individual MPAs. To count as a replicate of any given habitat, an MPA must contain enough habitat to encompass 90% of the biodiversity associated with that habitat. The minimum size required to encompass 90% of the associated biodiversity varies by habitat and has been determined from biological surveys (CDFW 2008). A summary of the minimum size requirements for habitat replication, in linear miles or square miles, is provided in Table F1.

**TABLE F1:** The minimum size required to encompass 90% of biodiversity for key MPA habitats. Hard and soft bottom habitats include depth ranges in meters (m).

HABITAT	MEASUREMENT	MINIMUM SIZE
Rocky Shores	Linear miles	0.60
Hard 0 - 30m	Linear miles	1.10
Hard 30 - 100m	Square miles	0.20
Hard 100 - 3000m	Square miles	0.20
Beaches	Linear miles	1.10
Soft 0 - 30m	Linear miles	1.10
Soft 30 - 100m	Square miles	5.00
Soft 30 - 3000m	Square miles	7.00
Kelp	Linear miles	1.10
Coastal Marsh	Square miles	0.04
Eelgrass	Square miles	0.04
Estuary	Square miles	0.12

Based on these recommendations, each MPA was scored for habitat representation and replication as follows: one point per habitat type that met minimum size requirements, and zero points for habitat types that did not meet the minimum size requirement.

### Level of protection (LOP) within an MPA

For comparisons among alternative MPA proposals, the SAT assigned a level of protection (LOP) to each MPA based on the proposed method of take within its boundaries. LOPs were based on the likely impacts of proposed activities to the ecosystems within an MPA. Conceptually, the SAT sought to answer the following question in assigning LOPs: “How much might an ecosystem differ from an unfished or unharvested ecosystem if one or more proposed activities are allowed (CDFW 2008, MLPA SAT 2008, 2009, 2011, Saarman et al. 2013)?”

The SAT assigned an LOP of “very high” to MPAs in which no take was permitted (SMRs and no-take SMCAs). MPAs that allowed extractive activities received LOPs ranging from “high” for low-impact activities to “low” for high-impact activities (e.g., habitat alteration). Both direct impacts (those resulting directly from the gear used or the removal of target or non-target species) and indirect impacts (ecosystem level effects of species removal) were considered in LOP assignments. For example, multiplier values ranged from 0 to 1 in increments of 0.2. A low LOP received a multiplier of 0, whereas, a very high LOP received a multiplier of 1 (Table F2).

**TABLE F2:** Possible levels of protection (LOPs) for each MPA type, corresponding LOP multiplier assigned for long-term monitoring site selection analysis, and examples of associated activities. SMR=State Marine Reserve, SMCA=State Marine Conservation Area.

LOP	MPA TYPES	MULTIPLIER	ASSOCIATED LOP ACTIVITIES
<b>VERY-HIGH</b>	SMR; SMCA (no-take)	1.0	No take
<b>HIGH</b>	SMCA	0.8	Salmon (hook and line [H&L] or troll in waters >50m depth); coastal pelagic finfish (H&L, round-haul net, dip net); white seabass and bonito (spear)
<b>MOD-HIGH</b>	SMCA	0.6	Dungeness crab (trap, hoop-net, diving); salmon (troll in water <50m depth); pier-based fishing (H&L, hoop net)
<b>MODERATE</b>	SMCA	0.4	Spot prawn (trap); sea cucumber (scuba/hookah); surfperch (H&L from shore); salmon (H&L in waters <50m depth)
<b>MOD-LOW</b>	SMCA	0.2	Lingcod, cabezon, rockfishes, sheephead, and greenlings (H&L, spearfishing, trap); red abalone (free-diving); urchin (diving)
<b>LOW</b>	SMCA	0.0	Rock scallop (scuba); giant kelp (mechanical harvest); ghost shrimp (hand harvest); mussels (hand harvest); bull kelp (hand harvest)

<sup>1</sup> Final North Coast LOPs: [http://www.dfg.ca.gov/marine/pdfs/northcoastproposals/rec\\_description.pdf](http://www.dfg.ca.gov/marine/pdfs/northcoastproposals/rec_description.pdf)

<sup>2</sup> Final North Central Coast LOPs: [http://www.dfg.ca.gov/marine/pdfs/ipa\\_description.pdf](http://www.dfg.ca.gov/marine/pdfs/ipa_description.pdf)

<sup>3</sup> Final Central Coast LOPs: [http://www.dfg.ca.gov/marine/pdfs/comparison\\_mpas.pdf](http://www.dfg.ca.gov/marine/pdfs/comparison_mpas.pdf)

<sup>4</sup> Final South Coast LOPs: [http://www.dfg.ca.gov/marine/pdfs/scsr\\_description\\_ipa.pdf](http://www.dfg.ca.gov/marine/pdfs/scsr_description_ipa.pdf)

MPAs were scored for LOP by multiplying each MPA's habitat threshold points (described above) by its LOP multiplier.

## MPA overlap with Areas of Special Biological Significance (ASBSs)

Although the MLPA does not specifically mandate water quality management within MPAs, marine life is known to be adversely affected by poor water quality. Ocean pollution has been linked to changes in marine population growth, reproduction, and mortality rates; decreased abundance of marine life; and shifts in community composition (e.g., decreased diversity and loss of sensitive species) (Pastorok & Bilyard 1985, Laist 1987, Derraik 2002, Echeveste et al. 2010). For MPA Network design, the SAT recommended that proposed MPAs avoid areas of poor water quality and be co-located with state water quality protection areas (e.g. ASBS) because they benefit from water quality protection beyond that offered by standard waste discharge restrictions (Fox et al. 2013). MPAs were scored for overlap with ASBSs by assigning a point value from 0 to 1 representing percent of area overlap with ASBS. For example, if an ASBS overlapped with 72% of the MPA's area, point value was 0.72.

## MPA overlap with historically protected area

The MLPA mandated that the state redesign its existing MPAs to function as an interconnected statewide network. Prior to the MLPA, California's existing 63 MPAs were generally small and established in an ad hoc manner throughout the state over many decades and using at least nine different designations (McArdle 1997, 2002; Gleason et al. 2013). During the redesign process, several MPAs overlapped with historical MPA boundaries. To prioritize MPAs that include a portion of an MPA predating the MLPA, MPAs were scored by summing two different point values, defined as follows:

An MPA received historical MPA overlap credit equivalent to the percentage of area overlapping with the historically protected area. For example, if a historically protected area overlapped with 64% of the MPA's area, the overlap credit was 0.64.

In addition, similar to LOP scoring, a historical MPA protection credit was given. The MPA received one point if the historical MPA prohibited all take and zero points if the historical MPA allowed any type of take.

Total historical MPA points = historical MPA overlap credit + historical MPA protection credit

## Calculating final design scores

Each MPA received a design score based on the following equation:

*Design score = MPA size points + habitat threshold points + LOP points + ASBS points + historical MPA points*

As an example, here are the points awarded to Point Lobos State Marine Reserve (SMR):

- MPA size points = 0
  - » Point Lobos SMR is approximately 5.5 sm<sup>2</sup>, which falls below the recommended minimum threshold of nine sm<sup>2</sup> as recommended by the SAT.
- Habitat threshold points = 6
  - » Point Lobos SMR meets the minimum habitat thresholds for rocky shores, kelp, hard bottom habitat 0-30 m, hard bottom habitat 30-100 m, beaches, and soft bottom habitat 0-30 m.
- LOP points = 6
  - » Point Lobos SMR was assigned an LOP of "very high" since it prohibits all take, therefore the MPA received a LOP "multiplier" of 1. LOP points were calculated by multiplying the LOP "multiplier" by the total sum of habitats protected, in this case 1\*6 = 6.
- ASBS points = 0.2
  - » Point Lobos SMR overlaps with the Carmel Bay/Point Lobos Ecological Reserve ASBS, with approximately 23.8% of the MPA overlapping with the ASBS.
- Historical MPA points = 1.3
  - » The current Point Lobos SMR is an expansion of a historical MPA. Established in 1973, the historical Point Lobos SMR did not allow take (protection credit = 1 point) and comprised approximately 26% of the area encompassed by the new MPA (overlap credit = 0.3 points), so total historical MPA points = 1 + 0.3 = 1.3.
- Based on the above information, Point Lobos SMR receives a **final design score of 13.5**.

All final MPA design feature scores for each coastal and island MPA are in Table F3, and for each estuarine MPA are in Table F4.

## Criteria 2: MPA historical monitoring

Responses of targeted fished species to MPA implementation can occur on the order of years to decades, and community responses tend to occur over longer time scales (Babcock et al. 2010, Caselle et al. 2015, Starr et al. 2015). **For a more informative and successful network evaluation, it is essential to prioritize MPAs with the longest possible time series of available data. This provides a more statistically robust before-after/control-impact analyses - in other words, a greater understanding of change over time.**

In order to offer an unbiased assessment of the statewide monitoring we used very specific criteria in order to include monitoring as part of “historical monitoring.” Specifically, the monitoring had to occur consistently throughout the state both before and after MPA implementation. There are a multitude of programs that offer long-term monitoring data (see section 2.2 “Examples of Important Existing Programs”), but were ultimately not included due to either temporal or spatial limitations. The approach to only include historical monitoring consistently conducted statewide limited the analysis to only rocky substrate programs. However, data collected by spatially limited survey programs such as the National Park Service’s KFMP at the Channel Islands will be integrated in future analyses.

### **Rocky intertidal monitoring: Multi-Agency Rocky Intertidal Network (MARINe) biodiversity and fixed plot surveys**

MARINe has conducted surveys at a set of rocky intertidal monitoring sites for more than 15 years. MARINe conducts two types of intertidal monitoring surveys:

*Biodiversity surveys* are designed to gather detailed information about the diversity and community structure of rocky intertidal communities, and how these communities change over time across a large geographic area. During these surveys, researchers identify and count all algae and invertebrates in a wide swath of the intertidal; they also record topographical information in order to create three-dimensional species distribution maps. MARINe biodiversity surveys have been conducted in each bioregion every 2-5 years since 2001.

*Fixed plot surveys* are designed to measure population trends for important intertidal species such as sea stars and abalone. Each year, MARINe researchers survey a set of fixed plots, counting and measuring a subset of ecologically important species and recording percent cover of habitat-forming species such as mussels, rockweed, and barnacles. MARINe fixed plot surveys have been conducted in each bioregion every year since at least 2001, with the earliest surveys dating back to the 1980s.

### **Nearshore (0-30 m) subtidal kelp forest monitoring: Partnership for Interdisciplinary Study of Coastal Oceans (PISCO) and ReefCheck California (RCCA) SCUBA surveys**

PISCO and RCCA collect data on kelp forest ecosystems including macroalgae, invertebrates, and fishes via SCUBA diver surveys. PISCO’s sampling protocols and training methods are standardized across affiliated institutions and partners, including UC Santa Cruz and UC Santa Barbara, and have data dating back to 1999. Using protocols similar to PISCO, RCCA has trained volunteer recreational divers to conduct surveys statewide since 2006.

### **Mid-depth (30-100 m) remotely operated vehicle (ROV) monitoring: CDFW/Marine Applied Research and Exploration (MARE) surveys**

CDFW and MARE have performed extensive ROV surveys inside and outside of MPAs since 2004. Data derived from ROV imagery is particularly powerful because all observations are precisely georeferenced, meaning that scientists can more effectively model species distributions and their habitat associations.

## Calculating final historical monitoring points

All coastal and island MPAs were scored for level of historical monitoring according to the following rule: MPAs received a single point for each of the five surveys described above (MARINE biodiversity surveys, MARINE fixed plot surveys, PISCO surveys, RCCA surveys, and CDFW/MARE surveys) for each survey replicate that was conducted each year since the beginning of the survey program. As an example, here are the historical monitoring points awarded to Point Lobos SMR:

- MARINE biodiversity survey = 4
  - » There is only one rocky intertidal site surveyed within Point Lobos. It has been surveyed for biodiversity by MARINE in 2001, 2005, 2014, and 2017, so receives a point value of 4.
- MARINE fixed plot survey = 19
  - » There is only one rocky intertidal site surveyed within Point Lobos. It has been surveyed for fixed plot sampling every year from 1999-2017, so receives a point value of 19.
- Kelp forest monitoring, PISCO = 18
  - » Within Point Lobos SMR, PISCO has three sites: Monastery (surveyed 1999-2016), Bluefish (surveyed 1999-2016), and Weston (surveyed 2001-2016). While multiple sites with years of survey data are available, Point Lobos only receives credit for the site with the greatest number of surveys. In this case two sites have 18 years of surveys, so 18 points are awarded.
- Kelp forest monitoring, RCCA = 12
  - » Within Point Lobos SMR, RCCA has four sites: North Monastery (surveyed 2008, 2010-2017), South Monastery (surveyed 2007-2017), Middle Reef (surveyed 2006-2017), and Weston (surveyed 2006-2017). While multiple sites with years of survey data are available, Point Lobos only receives credit for the site with the greatest number of surveys. In this case two sites have 12 years of surveys, so 12 points are awarded.
- Mid-depth ROV monitoring = 2
  - » Point Lobos SMR has been surveyed by ROV twice, once in 2008 and once in 2015, so receives a point value of 2.
- Total score: Based on this information,  
**Point Lobos SMR receives a preliminary historical monitoring score of 55.**

A multiplier was then applied as a filter to more highly weight MPAs that are capable of supporting multiple types of monitoring. The purpose of this filter was to determine which MPAs may be best suited for long-term monitoring across different habitat types. An MPA with a long survey history, but only one habitat monitored, is less likely to be of value in long-term monitoring than an MPA in which multiple habitats have been monitored. Therefore, for each of the monitoring habitats identified (rocky intertidal, kelp forest, and mid-depth rock) MPAs received a monitoring multiplier value of either 0, 1, 2, or 3 for each type of habitat surveyed by any method (i.e., if RCCA surveyed an MPA, but PISCO did not, the MPA still received credit for supporting kelp forest monitoring). Monitoring multipliers were then used in final historical monitoring scores as follows:

***Historical monitoring score = (rocky intertidal biodiversity points + rocky intertidal fixed plot points + PISCO kelp forest monitoring points + RCCA kelp forest monitoring points + mid-depth ROV points) \* monitoring multiplier***

Based on the above information, Point Lobos SMR received a final historical monitoring score of 165 (all three types of habitats were surveyed, so monitoring multiplier = 3;  $55 \times 3 = 165$ ); final historical monitoring scores for each coastal MPA are in Table F3.

### Criteria 3: Habitat-based connectivity contribution modeling

California's MPAs were designed and are managed to function as an ecologically cohesive, statewide network, especially in terms of larval dispersal. For most nearshore marine species, planktonic larval transport is primarily driven by oceanographic factors such as currents and seasonal upwelling. Over the last decade, there have been significant advances in oceanographic modeling. One widely used approach is the Regional Oceanographic Modeling System (ROMS), which tracks particle movement in four dimensions (space over time) based on simulated nearshore oceanographic conditions (Moore et al. 2011).

ROMS was applied to examine the larval connectivity of key habitats in the MPA Network (rocky intertidal, kelp and rocky reef 0-30 m, rocky reef 30-100 m, sandy beach, soft bottom 0-30 m, and soft bottom 30-100 m). Particles representing larvae were "released" into the model and allowed to remain for a range of 30-60 days. This range represents the pelagic larval duration (PLD), or how long larvae remain in the water column before settling, for most nearshore species (Shanks 2009). The total larval output (i.e., donor, source) and settlement (i.e., recipient, sink) was assessed for all non-estuarine MPA sites in the network. Sites were then ranked based on their total contribution to the MPA Network as both source and sink.

#### General ROMS methods

- Simulated oceanographic conditions in ROMS were based on 15-year averages (1999-2013).
- General model expanse was U.S.-Mexican border to U.S.-Canadian border.
- Particles were released from 557 cells along the expanse. These cells included all coastal areas of California with one important exception – the Farallon Islands, located approximately 27 miles off San Francisco, were not included.
- Approximately 88,000 "larvae" were released from each cell (all releases through all years), with a total of 49 million larvae released. Total settlement depended on the PLD.
  - » There have been a series of sensitivity studies to determine the number of particles required to provide an accurate set of results (the number required such the further increases do not affect the results). The number used in this study (1000 larvae released per month per cell) is much more than needed, but the model output can and has been used for other questions where larvae number requirements are higher.
- Model results for 11 PLDs (5, 10, 15, 20, 30, 45, 60, 90, 120, 150, 180 days) were obtained.
- Larvae moved hourly, but with daily averaged currents. Every hour, the daily average currents from the ROMS model were interpolated in space and time to find the current at each particle location. Then each particle was moved with its appropriate current velocity at that location. Landward of a certain depth range (500 m), the larvae were also given a random "kick" simulating tidal currents of 5 cm/s. This kick was also given every hour in addition to the daily-averaged motion.
- Settlement could only occur within 10% of PLD (e.g., for PLD of 30 days: 27-33 days)
- The ROMS output can be considered a measure of connectivity among cells (locations) but should not be considered an estimate of one cell's contribution of larvae (propagules) to other cells. This is because cells in ROMS grids are only characterized by oceanographic factors. In order to estimate the level of larval contribution, propagule production for donor cell, and amount of suitable habitat for receiving cells, high resolution habitat information must be incorporated as a sub-model.



## Habitat sub-models

The area or linear extent of key nearshore habitats was estimated for each ROMS cell in California, including those within MPAs, using a suite of data sources (e.g., seafloor mapping and existing GIS data layers). Linear extent was used for sandy beaches and rocky intertidal habitats, and area was used for all other habitats.

## Integrating ROMS and the habitat sub-models

Habitat and ROMS sub-models were integrated as follows. Raw larval connectivity between locations (i.e. cells, MPAs) was measured based on suitable habitat in the donor and recipient locations.

- An equation was applied to ensure that donor locations without certain types of habitat could not contribute propagules from those habitats. It also ensured that propagules associated with habitats not found in a location could not settle in recipient locations lacking those habitats.
- For a given PLD, or set of PLDs, the sum of contributions was calculated for all location pairs by habitat. For most locations, this is the same as the actual value (no summation required). However, some MPAs are found in multiple ROMS cells so the separate values for each portion of the cells represented by the MPA was summed to produce an MPA value.
- This suite of values was then queried to produce contribution or connectivity (or both) estimates for all habitats. In addition, other contribution/connectivity attributes were calculated as follows:
  - » The number of links to and from all locations. For example – the number of other locations that contributed to a recipient location or the number of other locations a donor location contributed to. Here the links were restricted based on the level of contribution or connectivity, which removed links where contribution or connectivity were very low ( $<0.0001$ ).
  - » The diversity of links. This was calculated using the Shannon-Weiner Index ( $H'$ ). This index incorporates the number of links and also the contribution or connectivity values for each link. High values are driven by many links of relatively even contribution or connectivity.

Examples of other metrics that can be produced via these methods:

- The contribution, links, and diversity of links (calculated using the Shannon-Weiner Index [ $H'$ ]) of specific MPAs to all locations
- The contribution, links, and diversity of links of all locations to specific MPAs
- The contribution, links, and diversity of links of specific MPAs to other MPAs

The final combined connectivity value (number of links to and from all locations) for each coastal MPA are found in Table F3.

## Criteria 4: High resolution mapping of recreational fishing effort

Recovery trajectories of fished populations following MPA implementation are highly dependent on the level of fishing mortality (F) to which those populations were subjected prior to protection (Micheli et. al 2004, White et al. 2013, Caselle et. al 2015, Starr et al. 2015, White et al. 2016). **In other words, more pronounced ecological change should be expected inside MPAs where F was once high, and these sites should be prioritized for long-term monitoring.**

In cases where there are not sufficient data to estimate direct mortality due to fishing, a related measure, fishing effort, can provide a proxy of relative historical fishing pressure and guidance for where long-term monitoring could be focused. In order to attribute fishing effort at a spatial scale appropriate for determining influence on specific MPAs, data must include spatial attributes recorded at resolutions that support linking fishing location with MPA boundaries. CDFW's California Recreational Fisheries Survey (CRFS) program began in 2004, and employs fisheries technicians to interview recreational anglers about their catch and fishing activities from private/rental boats, on chartered commercial passenger fishing vessels (CPFVs, or "party boats") led by hired boat captains, and from beaches and manmade structures that include piers and jetties. The private and rental boat survey data collected includes spatial and sampling effort attributes recorded at scales that support summation of records within relatively high resolution mapping units, which are one-minute latitude by one-minute longitude in size, excluding estuaries. Ideally, similar resolution data would be used for analogous synthesis of commercial fishing effort or catch; however, current commercial landing records for similar targeted species only support summation of effort and catch at a resolution of ten-minutes latitude by ten-minutes longitude, which is too coarse for this analysis. As such, Criteria 4 presents an index of historical recreational bottom fishing pressure on MPAs prior to implementation, independent of fishing pressure from other modes of fishing. While this does not describe the complete state of all fishing effort, it does identify sites that historically received high recreational effort and thus are expected to have a measurable (biotic) response to MPA treatment. Using CRFS interviews from 2006 to the last year prior to MPA implementation for each MLPA planning region (2011 for North, 2009 for North Central, 2006 for Central, 2011 for South), estimates of relative recreational ocean fishing effort by private/rental boats were mapped. A relative index of historical fishing effort was calculated by standardizing the sampled number of angler boat trips over time and area at sites now located within MPAs (Table F3). The analyses here focus on boat trips on which anglers targeted bottomfish, and exclude trips representing seasonally high effort on salmon and pelagic species that are not expected to stay within MPA boundaries. A one-mile buffer was applied around intersections of MPAs with the gridded blocks. Results indicated that relative fishing effort prior to MPA implementation was concentrated in coastal areas surrounding major ports and cities and surrounding island areas closest to these ports. Across California, relative fishing effort was highest in the southern bioregion (for bottomfish), although there were hotspots in all three bioregions (Figures F1, F2, and F3). The maximum relative fishing block effort in an MPA ranged from 0 to 139 trips/year across the different regions.

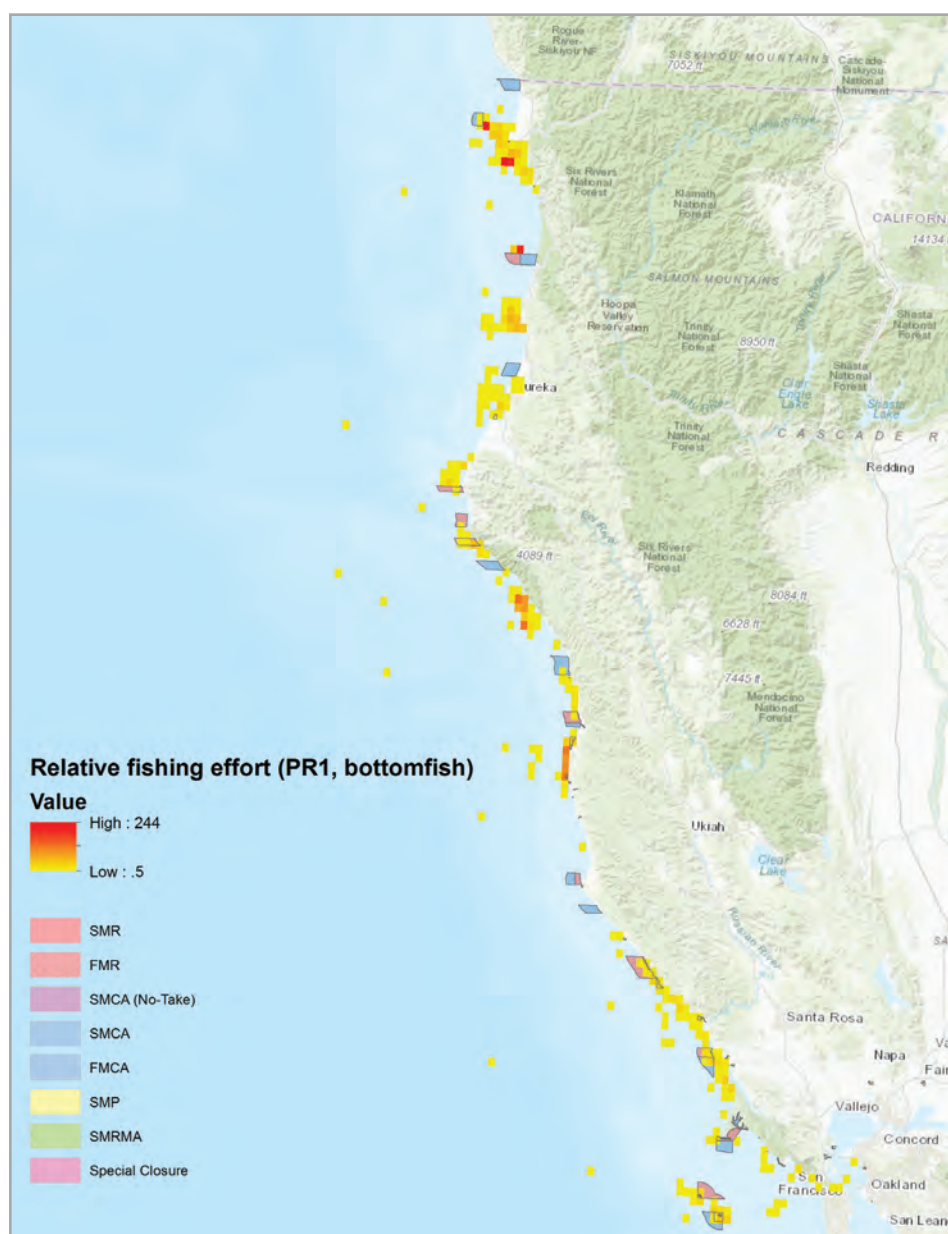
Historical recreational boat fishing hotspots for bottomfish emerged in the northern bioregion around Crescent City (Point St. George Reef Offshore State Marine Conservation Area [SMCA]), Reading Rock State Marine Reserve (SMR)/SMCA, and Fort Bragg (MacKerricher SMCA and Point Cabrillo SMR) (Figure F1). In the central bioregion, high relative fishing effort mapped to Point Buchon SMR/SMCA and MPAs between Halfmoon Bay and Santa Cruz (Montara SMR, Pillar Point SMCA, Año Nuevo SMR, Greyhound Rock SMCA) (Figure F2). Relatively high fishing effort prior to MPA implementation was also concentrated around Monterey (Pacific Grove Marine Gardens SMCA, and Asilomar SMR) (Figure F2). Along the southern bioregion mainland, Cabrillo SMR near San Diego had the highest relative fishing effort focused on bottomfish in the state. Dana Point SMCA, and the area around La Jolla (San Diego-Scripps Coastal SMCA, Matlahuayl SMR, and South La Jolla SMR/SMCA) were also important fishing grounds for bottomfish. In the Channel Islands, historical recreational hotspots targeting bottomfish were concentrated at Footprint SMR, Anacapa Island SMR/SMCA, and around Catalina

Island (Arrow Point to Lion Head Point SMCA, Long Point SMR, Casino Point SMCA, Lover's Cove SMCA, Blue Cavern Onshore/Offshore SMCAs, and Farnsworth Onshore/Offshore SMCAs) (Figure F3). The final relative fishing effort scores for each coastal MPA are found in Table F3.

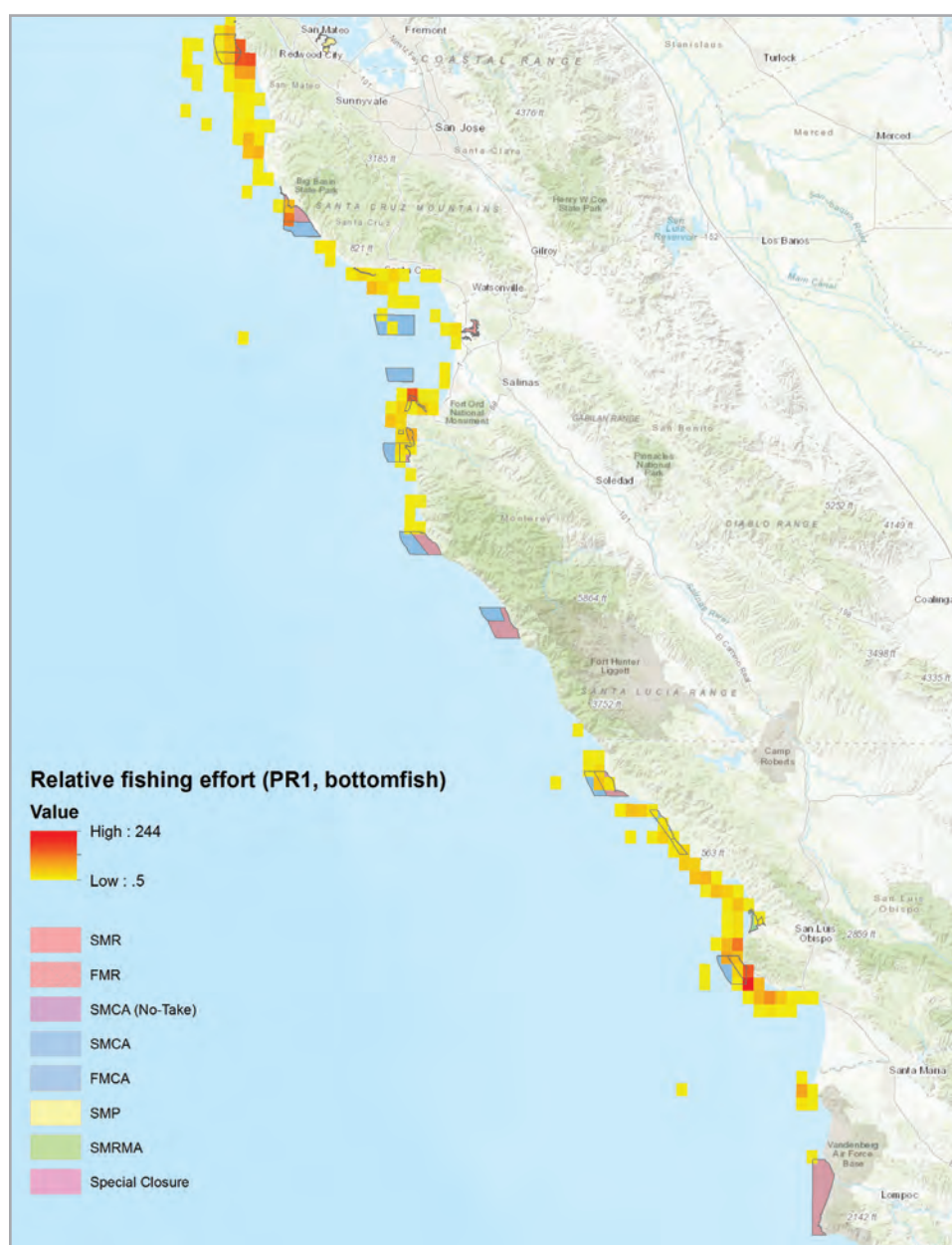
[1] <https://www.wildlife.ca.gov/Conservation/Marine/CRFS>

[2] Units are a relative index of effort (i.e., a result of 2.0 indicates twice as much effort relative to a result of 1.0). Values do not represent any measure of total effort.

[3] All species listed in the PPMC Pacific Coast Groundfish Fishery Management Plan (PPMC 2016) except leopard shark, California skate, sand sole and starry flounder; all species listed in the California Nearshore Fishery Management Plan (CDFW 2002); and unidentified bottomfish or groundfish, blacksmith, black croaker, white seabass, other flounders, sea chubs, groupers, grunts, Pacific halibut, sea basses (except spotted sand bass), kelpfishes, sculpins, wrasses, ocean whitefish, some surfperches (black, kelp, pink, rainbow, reef, sharpnose and striped) and other flatfish and sharks found in the nearshore over hard bottoms and offshore.

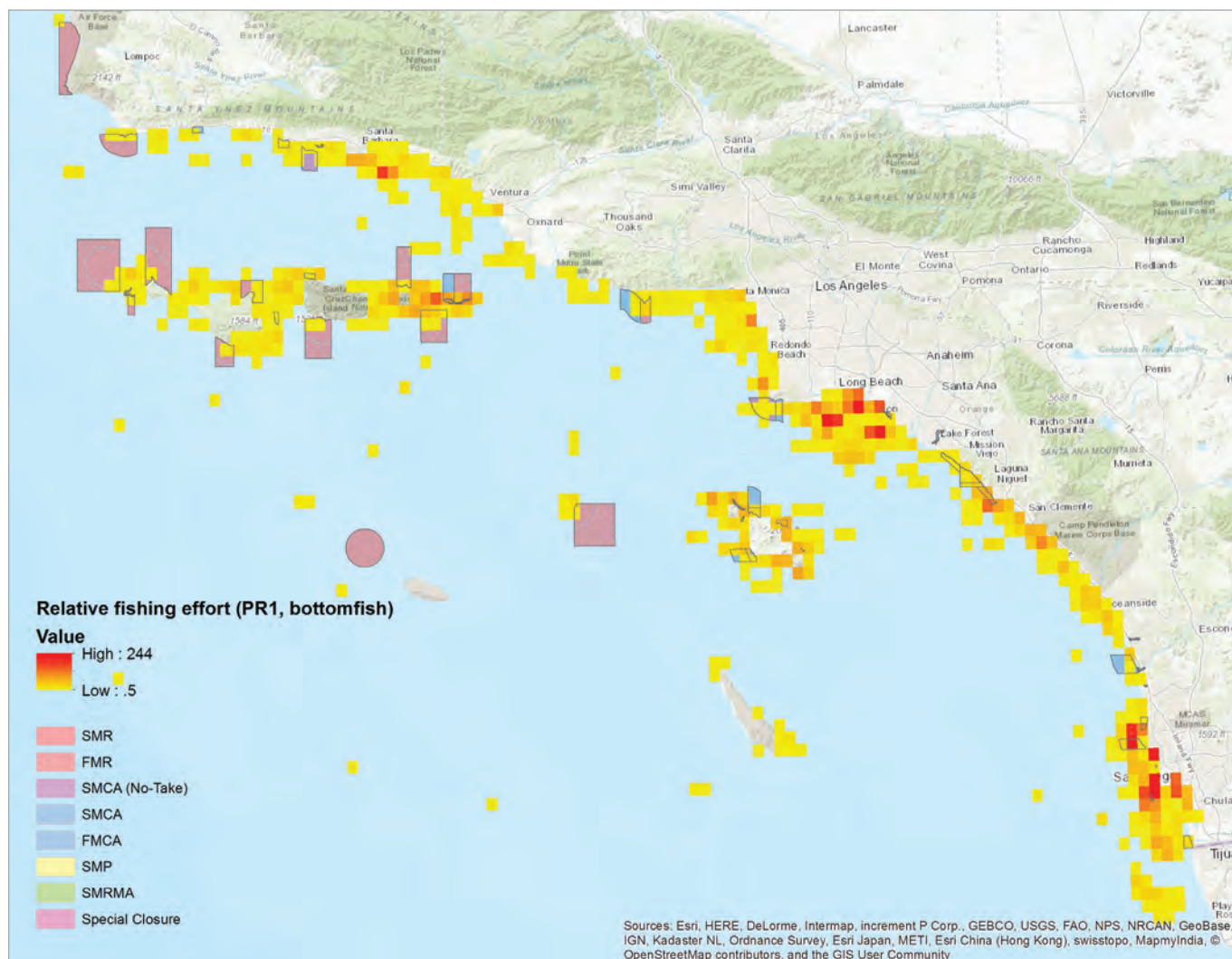


**FIGURE F1:** Distribution of maximum historical (pre-MPA) relative fishing effort by private/rental boat trips targeting bottomfish in the northern bioregion, based on California Recreational Fisheries Survey data. S[F]MR= state [federal] marine reserve, S[F]MCA=state [federal] marine conservation area, SMP=state marine park, SMRMA=state marine recreational management area.



**FIGURE F2:** Distribution of maximum historical (pre-MPA) relative fishing effort by private/rental boat trips targeting bottomfish in the central bioregion, based on California Recreational Fisheries Survey data. S[F]MR= state [federal] marine reserve, S[F]MCA=state [federal] marine conservation area, SMP=state marine park, SMRMA=state marine recreational management area.





**FIGURE F3:** Distribution of maximum historical (pre-MPA) relative fishing effort by private/rental boat trips targeting bottomfish in the southern bioregion, based on California Recreational Fisheries Survey data. S[F]MR= state [federal] marine reserve, S[F]MCA=state [federal] marine conservation area, SMP=state marine park, SMRMA=state marine recreational management area.

## MPA index site scores, rankings, and final tiered lists

### Integrating Quantitative Criteria into Tiered Approach for Index Site Selection

For each of the four criteria listed above, a rank-order list of MPAs (excluding estuarine MPAs) within each bioregion was generated based on final scores. The four individual rank-order values were then averaged to generate a final integrated rank-order value. MPAs were sorted into tiers based on these values, with cutoffs for each tier varying by bioregion to ensure equal bioregional representation of the MPAs within each of the three tiers. For example, the 34 North Coast MPAs were sorted so that 11 MPAs fell into Tier I, 11 MPAs fell into Tier II, and 12 MPAs fell into Tier III (Table F3).

**Tier I MPAs** received the highest integrated rank-order values. They meet many of the design criteria needed for effective protection, are well connected components of the MPA Network, and may have long time series of monitoring data and/or experienced high historical recreational fishing effort, which make these MPAs good candidates for detecting the potential effects of protection over time. Many of the MPAs on the Tier I index site list are state marine reserves.

**Tier II MPAs** received the second-highest integrated rank-order values. Many of these MPAs ranked high in one or two of the quantitative methods and may be considered valuable index sites for more specific research questions. Tier II MPAs can be considered for long-term monitoring when funding permits, when an MPA cluster is split between tiers, or to help answer more regionally focused questions.

**Tier III MPAs** received the lowest integrated rank-order values. Many of these MPAs are small, represent fewer habitats, are difficult to access, have limited or no long-term monitoring data, or have more allowable take within their boundaries. Tier III MPAs are recommended for long-term monitoring only to answer very specific or localized research questions.

Raw points and rank for each method (design features, monitoring history, connectivity modeling, and historical fishing effort), as well as final rank, are reported in Table F3 below.

**TABLE F3:** Recommended coastal MPA tiers within each bioregion (MPAs listed north to south) based on final rank. MPAs are ranked regionally within each category based on points awarded. Abbreviations: SMR = state marine reserve, SMCA = state marine conservation area

MPA AND DESIGNATION	MPA DESIGN FEATURES		MONITORING HISTORY		CONNECTIVITY MODELING		HISTORICAL FISHING EFFORT		FINAL RANK (AVERAGE)
	Points	Rank	Points	Rank	Points	Rank	Points	Rank	
NORTH COAST									
TIER I									
READING ROCK SMCA	3.7	21	2.0	24	7.1	9	60.3	2	14.0
READING ROCK SMR	3.0	24	3.0	21	4.6	13	60.3	2	15.0
SEA LION GULCH SMR	11.3	4	3.0	21	5.2	12	15.5	6	10.8
TEN MILE SMR	15.0	1	6.0	12	7.2	8	2.7	23	11.0
MACKERRICHER SMCA	3.3	23	6.0	12	2.3	19	36.9	4	14.5
SAUNDERS REEF SMCA	8.3	9	24.0	5	5.9	10	0.0	27	12.8
STEWARTS POINT SMR	12.0	3	12.0	9	19.0	2	7.9	14	7.0
SALT POINT SMCA	5.5	15	12.0	9	2.3	20	7.9	14	14.5
BODEGA HEAD SMR	12.1	2	56.0	1	10.0	5	12.0	10	4.5
BODEGA HEAD SMCA	5.8	13	4.0	14	10.6	4	12.5	9	10.0
POINT REYES SMR	9.3	5	14.0	7	14.0	3	4.2	18	8.3
TIER II									
POINT ST. GEORGE REEF OFFSHORE SMCA	4.0	18	2.0	24	1.1	24	73.7	1	16.8
SOUTH CAPE MENDOCINO SMR	9.0	6	1.0	30	4.0	16	9.6	11	15.8
BIG FLAT SMCA	6.3	12	1.0	30	5.5	11	6.0	17	17.5
DOUBLE CONE ROCK SMCA	9.0	6	0.0	32	8.9	6	3.4	21	16.3
POINT CABRILLO SMR	2.5	28	4.0	14	0.8	25	32.6	5	18.0
POINT ARENA SMR	8.2	10	42.0	2	2.0	22	0.0	27	15.3
POINT REYES SMCA	2.6	27	3.0	21	21.7	1	4.2	18	16.8
DUXBURY REEF SMCA	4.6	16	15.0	6	3.0	18	0.0	27	16.8
NORTH FARALLON ISLANDS SMR	8.4	8	2.0	24	ND*	32	9.2	12	19.0
SOUTHEAST FARALLON ISLAND SMR	5.7	14	4.0	14	ND*	32	12.5	7	16.8
SOUTHEAST FARALLON ISLAND SMCA	4.6	17	4.0	14	ND*	32	12.5	7	17.5
TIER III									
PYRAMID POINT SMCA	3.0	24	4.0	14	4.6	14	0.0	27	19.8
SAMOA SMCA	4.0	18	0.0	32	8.1	7	0.0	27	21.0
MATTOLE CANYON SMR	7.0	11	2.0	24	3.4	17	1.4	26	19.5
TEN MILE BEACH SMCA	0.0	34	0.0	32	2.0	23	2.3	24	28.3
RUSSIAN GULCH SMCA	1.4	31	4.0	14	0.7	26	8.3	13	21.0
VAN DAMME SMCA	0.4	33	11.0	11	0.1	31	0.0	27	25.5
POINT ARENA SMCA	3.6	22	4.0	14	4.5	15	0.0	27	19.5
SEA LION COVE SMCA	1.2	32	40.0	3	0.5	27	0.0	27	22.3
DEL MAR LANDING SMR	2.8	26	14.0	7	0.3	29	1.8	25	21.8
STEWARTS POINT SMCA	4.0	18	2.0	24	2.2	21	3.9	20	20.8
GERSTLE COVE SMR	1.7	29	34.0	4	0.1	30	6.3	16	19.8
RUSSIAN RIVER SMCA	1.4	30	2.0	24	0.4	28	3.2	22	26.0



MPA AND DESIGNATION	MPA DESIGN FEATURES		MONITORING HISTORY		CONNECTIVITY MODELING		HISTORICAL FISHING EFFORT		FINAL RANK (AVERAGE)
	Points	Rank	Points	Rank	Points	Rank	Points	Rank	
CENTRAL COAST									
TIER I									
MONTARA SMR	11.1	7	27.0	17	15.5	3	46.4	3	7.5
AÑO NUEVO SMR	13.9	3	40.0	15	11.5	6	37.0	7	7.8
GREYHOUND ROCK SMCA	5.2	13	52.0	11	12.8	5	37.0	7	9.0
CARMEL BAY SMCA	6.9	9	165.0	1	3.7	18	20.0	9	9.3
POINT LOBOS SMR	13.5	4	165.0	1	10.3	8	20.0	9	5.5
PIEDRAS BLANCAS SMR	15.0	2	90.0	5	10.2	9	14.3	13	7.3
POINT BUCHON SMR	10.0	8	66.0	8	10.0	10	67.6	1	6.8
POINT BUCHON SMCA	6.4	11	3.0	19	13.2	4	67.6	1	8.8
VANDENBERG SMR	15.1	1	76.0	7	29.9	1	1.0	23	8.0
TIER II									
PILLAR POINT SMCA	3.2	23	3.0	19	9.2	13	46.4	3	14.5
NATURAL BRIDGES SMR	4.0	21	78.0	6	3.1	19	17.0	12	14.5
SOQUEL CANYON SMCA	6.2	12	1.0	23	20.8	2	1.9	22	14.8
PACIFIC GROVE MARINE GARDENS SMCA	4.0	20	46.0	13	2.8	20	45.8	5	14.5
ASILOMAR SMR	6.5	10	60.0	9	3.7	16	45.8	5	10.0
POINT SUR SMR	13.0	5	111.0	3	9.5	11	3.0	20	9.8
BIG CREEK SMR	12.2	6	46.0	13	7.0	14	0.0	24	14.3
CAMBRIA SMCA	5.0	14	50.0	12	4.5	15	10.5	16	14.3
TIER III									
PORTUGUESE LEDGE SMCA	4.6	17	1.0	23	3.7	17	0.0	24	20.3
EDWARD F. RICKETTS SMCA	2.0	26	30.0	16	0.5	24	10.4	17	20.8
LOVERS POINT - JULIA PLATT SMR	4.7	16	110.0	4	0.7	23	10.4	17	15.0
CARMEL PINNACLES SMR	2.9	24	4.0	18	0.2	26	20.0	9	19.3
POINT LOBOS SMCA	4.2	19	2.0	22	0.4	25	7.7	19	21.3
POINT SUR SMCA	4.6	17	3.0	19	11.1	7	3.0	20	15.8
BIG CREEK SMCA	2.4	25	1.0	23	1.4	22	0.0	24	23.5
PIEDRAS BLANCAS SMCA	3.6	22	1.0	23	9.2	12	14.3	13	17.5
WHITE ROCK SMCA	5.0	14	58.0	10	1.5	21	11.5	15	15.0

MPA AND DESIGNATION	MPA DESIGN FEATURES		MONITORING HISTORY		CONNECTIVITY MODELING		HISTORICAL FISHING EFFORT		FINAL RANK (AVERAGE)
	Points	Rank	Points	Rank	Points	Rank	Points	Rank	
SOUTH COAST									
TIER I									
POINT CONCEPTION SMR	18.0	2	108.0	7	24.3	2	2.5	41	13.0
CAMPUS POINT SMCA	15.0	5	141.0	3	12.6	10	3.5	36	13.5
HARRIS POINT SMR	22.2	1	165.0	2	33.8	1	6.0	34	9.5
CARRINGTON POINT SMR	13.0	6	28.0	22	15.7	7	10.0	26	15.3
SCORPION SMR	8.5	13	90.0	8	13.4	9	15.8	21	12.8
ANACAPA ISLAND SMCA	4.8	24	62.0	12	10.8	11	24.4	9	14.0
ANACAPA ISLAND SMR	11.0	10	225.0	1	16.0	6	28.5	8	6.3
POINT DUME SMCA	8.4	14	57.0	13	18.8	3	9.4	27	14.3
POINT DUME SMR	10.2	11	120.0	4	8.6	14	9.4	27	14.0
BLUE CAVERN ONSHORE SMCA	11.1	8	74.0	9	1.9	29	18.3	15	15.3
LAGUNA BEACH SMR	11.0	9	117.0	5	14.4	8	18.2	19	10.3
DANA POINT SMCA	5.0	22	64.0	11	9.2	13	38.8	5	12.8
SWAMI'S SMCA	11.9	7	1.0	31	17.0	4	12.1	24	16.5
SOUTH LA JOLLA SMR	8.0	16	36.0	20	5.8	15	69.5	2	13.3
TIER II									
SOUTH POINT SMR	16.4	3	50.0	15	4.7	19	7.0	32	17.3
GULL ISLAND SMR	15.3	4	46.0	19	5.4	16	3.8	35	18.5
BEGG ROCK SMR	8.4	15	0.0	35	16.5	5	0.0	42	24.3
SANTA BARBARA ISLAND SMR	4.4	26	117.0	5	3.0	24	7.0	31	21.5
POINT VICENTE SMCA	5.0	23	27.0	24	5.0	18	19.4	10	18.8
ABALONE COVE SMCA	5.4	21	28.0	22	5.2	17	19.4	10	17.5
ARROW POINT TO LION HEAD POINT SMCA	5.9	20	0.0	35	2.0	28	18.3	15	24.5
LONG POINT SMR	8.0	16	12.0	26	1.5	35	18.7	14	22.8
CRYSTAL COVE SMCA	4.6	25	74.0	9	9.9	12	7.4	30	19.0
LAGUNA BEACH SMCA	2.0	37	50.0	15	4.4	20	18.2	19	22.8
SAN DIEGO-SCRIPPS COASTAL SMCA	2.5	34	56.0	14	3.3	22	38.6	6	19.0
MATLAHUAYL SMR	7.5	18	48.0	17	2.5	27	38.6	6	17.0
SOUTH LA JOLLA SMCA	1.8	39	1.0	31	2.7	26	69.5	2	24.5
CABRILLO SMR	2.1	36	31.0	21	1.0	37	139.0	1	23.8

MPA AND DESIGNATION	MPA DESIGN FEATURES		MONITORING HISTORY		CONNECTIVITY MODELING		HISTORICAL FISHING EFFORT		FINAL RANK (AVERAGE)
	Points	Rank	Points	Rank	Points	Rank	Points	Rank	
SOUTH COAST									
TIER III									
KASHTAYIT SMCA	3.0	33	0.0	35	1.7	32	2.8	39	34.8
NAPLES SMCA	4.0	27	48.0	17	2.8	25	6.1	33	25.5
RICHARDSON ROCK SMR	3.6	30	0.0	35	0.8	38	2.7	40	35.8
JUDITH ROCK SMR	3.8	29	1.0	31	1.8	30	3.1	37	31.8
SKUNK POINT SMR	9.9	12	6.0	29	1.4	36	2.9	38	28.8
PAINTED CAVE SMCA	3.4	32	16.0	25	3.2	23	12.0	25	26.3
FOOTPRINT SMR	1.1	40	0.0	35	1.7	33	44.6	4	28.0
BLUE CAVERN OFFSHORE SMCA	1.8	38	0.0	35	0.0	41	18.3	15	32.3
CASINO POINT SMCA	0.0	42	12.0	26	0.0	42	18.9	12	30.5
LOVER'S COVE SMCA	0.3	41	0.0	35	0.1	40	18.9	12	32.0
FARNSWORTH ONSHORE SMCA	7.2	19	8.0	28	1.6	34	12.7	22	25.8
FARNSWORTH OFFSHORE SMCA	3.9	28	3.0	30	1.8	31	12.7	22	27.8
CAT HARBOR SMCA	2.4	35	1.0	31	0.7	39	18.3	15	30.0
TIJUANA RIVER MOUTH SMCA	3.6	31	0.0	35	3.4	21	8.2	29	29.0

\* ROMS data from the Farallon Islands were not available due to spatial constraints.

In addition to the 102 new or redesigned coastal and island MPAs, the MPA design and siting process established 22 estuarine MPAs in California (see Action Plan, Section 2.3). Only one of the four quantitative methods (MPA Design Features) integrated into the tiered approach for index site selection could be applied to estuaries. Therefore, in order to assign estuarine MPAs into one of three tiers, they were separated from coastal MPAs and only evaluated on their ability to meet the SAT recommended MPA design features.

However, not all MPA design features evaluated by the SAT applied to estuaries. For example, estuarine MPAs were exempted from the size guidelines because MPA size was often constrained by estuarine boundaries, and spacing was not evaluated for the three estuarine habitats (Saarman et al. 2013). Additionally, ASBSs are only coastal features and do not apply to estuaries, and are therefore also excluded. Of the potential MPA design feature scores detailed earlier in this appendix, only habitat threshold points, LOP points, and historical MPA points apply to estuarine MPAs. Finally, since most estuaries are unique ecosystems, regardless of geographical location (see Action Plan, Section 2.3, Monitoring in Other Habitat Types, pages 41-42) estuarine MPAs were ranked relative to one another on a statewide rather than regional basis (Table F4).

**TABLE F4:** Recommended estuarine MPA tiers within each bioregion (MPAs listed north to south) based on final rank. MPAs are ranked statewide based on points awarded. Abbreviations: SMR = state marine reserve, SMCA = state marine conservation area, SMRMA = state marine recreational management area.

MPA and DESIGNATION	BIOREGION	MPA DESIGN FEATURES	
		Points	Rank
TIER I			
ESTERO DE LIMANTOUR SMR	North	10.5	1
DRAKES ESTERO SMCA	North	5.0	5
ELKHORN SLOUGH SMR	Central	5.5	4
GOLETA SLOUGH SMCA	South	4.9	7
BOLSA CHICA BASIN SMCA	South	6.2	2
BATIKITOS LAGOON SMCA	South	6.2	3
SAN ELIJO LAGOON SMCA	South	4.9	6
TIER II			
SOUTH HUMBOLDT BAY SMRMA	North	3.0	11
NAVARRO RIVER ESTUARY SMCA	North	2.0	13
RUSSIAN RIVER SMRMA	North	4.0	8
MORO COJO SLOUGH SMR	Central	2.0	13
MORRO BAY SMRMA	Central	4.0	8
MORRO BAY SMR	Central	4.0	8
UPPER NEWPORT BAY SMCA	South	2.8	12
TIER III			
TEN MILE ESTUARY SMCA	North	1.0	15
BIG RIVER ESTUARY SMCA	North	1.0	15
ESTERO AMERICANO SMRMA	North	0.0	20
ESTERO DE SAN ANTONIO SMRMA	North	0.0	20
ELKHORN SLOUGH SMCA	Central	1.0	15
BOLSA BAY SMCA	South	0.9	19
SAN DIEGUITO LAGOON SMCA	South	1.0	18
FAMOSA SLOUGH SMCA	South	0.0	20

**TABLE F5:** Soft bottom habitats - area or linear extent of coastline and percentage of available habitats within each bioregion - Tier I MPA sites.

MPA	BIOREGION	TOTAL AREA (mi <sup>2</sup> )	BEACHES (linear mi)	%	SOFT SUBSTRATE 0-30M (linear mi)	%	SOFT SUBSTRATE 30-100M (area mi <sup>2</sup> )	%	SOFT SUBSTRATE 100 - 3000M (area mi <sup>2</sup> )	%	ESTUARY (area mi <sup>2</sup> )	%	EELGRASS (area mi <sup>2</sup> )	%	COASTAL MARSH (area mi <sup>2</sup> )	%
READING ROCK SMCA	NORTH	11.96	2.96	0.8%	2.82	1.2%	3.77	0.5%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
READING ROCK SMR		9.60	0.00	0.0%	0.00	0.0%	9.43	1.1%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
SEA LION GULCH SMR		10.42	2.42	0.6%	2.01	0.9%	3.86	0.5%	1.09	1.4%	0.00	0.0%	0.00	0.0%	0.00	0.0%
TEN MILE SMR		11.95	2.63	0.7%	2.00	0.9%	8.13	1.0%	0.46	0.6%	0.00	0.0%	0.00	0.0%	0.01	0.0%
MACKERRICHER SMCA		2.48	4.40	1.1%	0.00	0.0%	0.06	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.01	0.0%
SAUNDERS REEF SMCA		9.36	1.83	0.5%	0.19	0.1%	5.25	0.6%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
STEWARTS POINT SMR		24.06	0.89	0.2%	0.18	0.1%	21.89	2.7%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
SALT POINT SMCA		1.84	0.59	0.1%	0.36	0.2%	0.37	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
BODEGA HEAD SMR		9.34	1.32	0.3%	0.26	0.1%	5.38	0.7%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
BODEGA HEAD SMCA		12.31	0.00	0.0%	0.00	0.0%	6.31	0.8%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
POINT REYES SMR		9.55	8.38	2.1%	2.07	0.9%	1.20	0.1%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
MONTARA SMR	CENTRAL	11.81	2.14	0.8%	0.95	0.4%	7.75	1.3%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.01	0.0%
AÑO NUEVO SMR		11.15	10.46	3.8%	3.34	1.4%	1.63	0.3%	0.00	0.0%	0.00	0.1%	0.00	0.0%	0.05	0.1%
GREYHOUND ROCK SMCA		12.00	2.79	1.0%	0.70	0.3%	8.61	1.4%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
CARMEL BAY SMCA		2.20	3.09	1.1%	1.58	0.7%	0.36	0.1%	0.07	0.0%	0.02	0.2%	0.00	0.0%	0.02	0.1%
POINT LOBOS SMR		5.50	2.10	0.8%	1.36	0.6%	2.05	0.3%	0.33	0.2%	0.00	0.0%	0.00	0.0%	0.01	0.0%
PIEDRAS BLANCAS SMR		10.44	5.48	2.0%	4.43	1.9%	2.25	0.4%	0.00	0.0%	0.01	0.2%	0.00	0.0%	0.06	0.1%
POINT BUCHON SMR		6.68	1.46	0.5%	0.73	0.3%	4.56	0.8%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
POINT BUCHON SMCA		12.19	0.00	0.0%	0.00	0.0%	8.11	1.3%	3.02	1.9%	0.00	0.0%	0.00	0.0%	0.00	0.0%
VANDENBERG SMR		32.91	13.33	4.9%	12.82	5.5%	10.11	1.7%	0.00	0.0%	0.04	0.6%	0.00	0.0%	0.09	0.2%
POINT CONCEPTION SMR		22.52	2.73	0.6%	1.83	0.5%	15.79	2.4%	3.26	0.8%	0.00	0.0%	0.00	0.0%	0.01	0.0%
CAMPUS POINT SMCA	SOUTH	10.56	3.02	0.7%	1.21	0.3%	7.08	1.1%	1.48	0.4%	0.01	0.0%	0.00	0.0%	0.01	0.0%
HARRIS POINT SMR		25.40	2.71	0.6%	5.60	1.5%	15.93	2.4%	2.54	0.6%	0.00	0.0%	0.00	0.0%	0.00	0.0%
CARRINGTON POINT SMR		12.78	0.82	0.2%	3.32	0.9%	3.82	0.6%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
SCORPION SMR		9.64	0.89	0.2%	2.28	0.6%	4.88	0.7%	0.18	0.0%	0.00	0.0%	0.01	0.0%	0.00	0.0%
ANACAPA ISLAND SMCA		7.30	0.19	0.0%	1.74	0.5%	6.21	0.9%	0.18	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
ANACAPA ISLAND SMR		11.55	1.12	0.3%	2.59	0.7%	7.25	1.1%	0.78	0.2%	0.00	0.0%	0.00	0.0%	0.00	0.0%
POINT DUME SMCA		15.92	4.09	0.9%	3.14	0.9%	5.95	0.9%	7.18	1.8%	0.00	0.0%	0.00	0.0%	0.00	0.0%
POINT DUME SMR		7.53	2.77	0.6%	1.81	0.5%	1.07	0.2%	4.30	1.1%	0.00	0.0%	0.00	0.0%	0.00	0.0%
BLUE CAVERN ONSHORE SMCA		2.61	1.66	0.4%	1.89	0.5%	0.79	0.1%	1.43	0.4%	0.00	0.0%	0.00	0.0%	0.00	0.0%
LAGUNA BEACH SMR		6.72	3.48	0.8%	3.65	1.0%	2.82	0.4%	1.79	0.5%	0.00	0.0%	0.00	0.0%	0.00	0.0%
DANA POINT SMCA		3.47	3.60	0.8%	1.90	0.5%	0.79	0.1%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
SWAMI'S SMCA		12.71	3.77	0.9%	1.29	0.4%	3.85	0.6%	5.52	1.4%	0.00	0.0%	0.00	0.0%	0.00	0.0%
SOUTH LA JOLLA SMR		5.04	2.33	0.5%	0.07	0.0%	0.85	0.1%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
<b>NORTH BIOREGION TOTAL</b>		1618.90	391.45		227.31		820.08		75.93		60.84		13.31		136.88	
<b>CENTRAL BIOREGION TOTAL</b>		1317.84	272.90		231.37		602.63		158.19		7.02		1.94		45.02	
<b>SOUTH BIOREGION TOTAL</b>		2350.87	441.29		362.57		672.08		392.73		43.30		19.64		60.78	

\*All miles are statute.

**TABLE F6:** Rocky habitats - area or linear extent of coastline and percentage of available habitats within each bioregion - Tier I MPA sites.

MPA	BIOREGION	TOTAL AREA (mi <sup>2</sup> )	ROCKY INTERTIDAL (linear mi)	%	KELP (linear mi)	%	HARD SUBSTRATE 0-30M (linear mi <sup>2</sup> )	%	HARD SUBSTRATE 30-100M (area mi <sup>2</sup> )	%	HARD SUBSTRATE 100-3000M (area mi <sup>2</sup> )	%
READING ROCK SMCA	NORTH	11.96	0.22	0.1%	0.00	0.0%	0.08	0.1%	0.00	0.0%	0.00	0.0%
READING ROCK SMR		9.60	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.16	0.2%	0.00	0.0%
SEA LION GULCH SMR		10.42	2.32	0.8%	0.19	0.2%	0.56	0.5%	2.86	3.6%	0.12	15.5%
TEN MILE SMR		11.95	6.77	2.2%	2.43	2.3%	1.10	1.0%	0.50	0.6%	0.00	0.0%
MACKERRICHER SMCA		2.48	3.91	1.3%	2.23	2.1%	0.00	0.0%	0.05	0.1%	0.00	0.0%
SAUNDERS REEF SMCA		9.36	4.29	1.4%	1.11	1.1%	2.52	2.2%	1.65	2.1%	0.00	0.0%
STEWARTS POINT SMR		24.06	4.57	1.5%	3.00	2.9%	3.03	2.6%	0.88	1.1%	0.00	0.0%
SALT POINT SMCA		1.84	4.03	1.3%	3.84	3.7%	2.46	2.1%	0.54	0.7%	0.00	0.0%
BODEGA HEAD SMR		9.34	2.74	0.9%	0.00	0.0%	2.27	2.0%	1.85	2.3%	0.00	0.0%
BODEGA HEAD SMCA		12.31	0.29	0.1%	0.00	0.0%	1.33	1.2%	5.11	6.5%	0.00	0.0%
POINT REYES SMR		9.55	5.37	1.8%	0.00	0.0%	1.49	1.3%	0.09	0.1%	0.00	0.0%
MONTARA SMR	CENTRAL	11.81	3.45	1.4%	0.55	0.4%	2.73	2.8%	0.72	1.6%	0.00	0.0%
AÑO NUEVO SMR		11.15	6.86	2.9%	0.24	0.2%	1.83	1.9%	0.79	1.7%	0.00	0.0%
GREYHOUND ROCK SMCA		12.00	3.39	1.4%	0.08	0.1%	2.38	2.5%	0.03	0.1%	0.00	0.0%
CARMEL BAY SMCA		2.20	2.66	1.1%	2.57	1.7%	1.15	1.2%	0.12	0.3%	0.02	0.1%
POINT LOBOS SMR		5.50	13.70	5.7%	4.61	3.1%	3.91	4.1%	1.38	3.0%	0.02	0.1%
PIEDRAS BLANCAS SMR		10.44	6.09	2.5%	4.18	2.8%	2.10	2.2%	0.54	1.2%	0.00	0.0%
POINT BUCHON SMR		6.68	2.71	1.1%	1.85	1.2%	2.59	2.7%	0.47	1.0%	0.00	0.0%
POINT BUCHON SMCA		12.19	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.32	0.7%	0.04	0.1%
VANDENBERG SMR		32.91	10.21	4.3%	0.63	0.4%	1.45	1.5%	0.08	0.2%	0.00	0.0%
POINT CONCEPTION SMR	SOUTH	22.52	3.13	1.1%	1.29	0.5%	1.84	1.0%	0.32	0.7%	0.10	1.6%
CAMPUS POINT SMCA		10.56	1.37	0.5%	1.62	0.6%	1.85	1.0%	0.04	0.1%	0.00	0.0%
HARRIS POINT SMR		25.40	8.18	2.9%	2.30	0.9%	1.96	1.0%	2.40	5.0%	0.25	4.1%
CARRINGTON POINT SMR		12.78	5.35	1.9%	1.24	0.5%	1.97	1.0%	0.27	0.6%	0.00	0.0%
SCORPION SMR		9.64	4.07	1.4%	0.05	0.0%	0.69	0.4%	0.33	0.7%	0.01	0.1%
ANACAPA ISLAND SMCA		7.30	3.50	1.2%	0.00	0.0%	0.54	0.3%	0.03	0.1%	0.00	0.0%
ANACAPA ISLAND SMR		11.55	6.50	2.3%	0.65	0.3%	0.65	0.3%	0.10	0.2%	0.00	0.0%
POINT DUME SMCA		15.92	0.44	0.2%	0.85	0.3%	1.05	0.5%	0.00	0.0%	0.00	0.0%
POINT DUME SMR		7.53	1.54	0.5%	0.57	0.2%	0.47	0.2%	0.00	0.0%	0.89	14.7%
BLUE CAVERN ONSHORE SMCA		2.61	1.68	0.6%	1.40	0.6%	0.88	0.5%	0.01	0.0%	0.00	0.0%
LAGUNA BEACH SMR		6.72	2.48	0.9%	0.00	0.0%	1.13	0.6%	0.00	0.0%	0.00	0.0%
DANA POINT SMCA		3.47	2.06	0.7%	0.80	0.3%	1.67	0.9%	0.00	0.0%	0.00	0.0%
SWAMI'S SMCA		12.71	1.20	0.4%	1.44	0.6%	1.43	0.7%	0.02	0.0%	0.04	0.7%
SOUTH LA JOLLA SMR		5.04	1.45	0.5%	0.72	0.3%	1.95	1.0%	0.50	1.0%	0.00	0.0%
<b>NORTH BIOREGION TOTAL</b>		1618.90	301.58		104.23		114.65		79.24		0.76	
<b>CENTRAL BIOREGION TOTAL</b>		1317.84	238.83		151.07		95.97		46.60		29.98	
<b>SOUTH BIOREGION TOTAL</b>		2350.87	280.71		253.51		191.62		47.79		6.05	

\*All miles are statute.

## LITERATURE CITED

- Babcock RC, Shears N, Alcala AC, Barrett NS, Edgar GJ, Lafferty KD, McClanahan TR, Russ GR. 2010. Decadal trends in marine reserves reveal differential rates of change in direct and indirect effects. *Proceedings of the National Academy of Sciences of the United States of America*. 107(43):18256-18261.
- California Department of Fish and Wildlife. 2002. Nearshore Fishery Management Plan. California Natural Resources Agency, California Department of Fish and Wildlife, Marine Region.
- California Department of Fish and Wildlife. 2008. Draft California Marine Life Protection Act Master Plan for Marine Protected Areas. Adopted by the California Fish and Game Commission in February 2008.
- California Department of Fish and Wildlife. 2016. California Marine Life Protection Act Master Plan for Marine Protected Areas. Adopted by the California Fish and Game Commission on August 24, 2016. Retrieved from [www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan](http://www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan).
- Caselle JE, Rassweiler A, Hamilton SL, Warner RR. 2015. Recovery trajectories of kelp forest animals are rapid yet spatially variable across a network of temperate marine protected areas. *Scientific Reports*. 5:1-14.
- Derraik JGB 2002. The pollution of the marine environment by plastic debris: a review. *Mar. Pollut. Bull.* 44(9):842-852.
- Echeveste PJ, Dachs J, Berrojalbiz N, Agusti S. 2010. Decrease in the abundance and viability of oceanic phytoplankton due to trace levels of complex mixtures of organic pollutants. *Chemosphere*. 81:161-168.
- Fox E, Hastings S, Miller-Henson M, Monie D, Ugoretz J, Frimodig A, Shuman C, Owens B, Garwood R, Connor D. 2013. Addressing policy issues in a stakeholder-based and science-driven marine protected area network planning process. *Ocean & Coastal Management*. 74:34-44.
- Gleason M, Fox E, Ashcraft S, Vasques J, Whiteman E, Serpa P, Saarman E, Caldwell M, Frimodig A, Miller-Henson M et al. 2013. Designing a network of marine protected areas in California: Achievements, costs, lessons learned, and challenges ahead. *Ocean & Coastal Management*. 74:90-101.
- Laist DW. 1987. Overview of the biological effects of lost and discarded plastic debris in the marine environment. *Marine Pollution Bulletin*. 18:319-326.
- McArdle DA. 1997. California Marine Protected Areas. California Sea Grant College System, La Jolla, California. Publication No. T-039.
- McArdle DA. 2002. California Marine Protected Areas: Past & Present. California Sea Grant College System Publication. La Jolla, California.
- Micheli F, Halpern BS, Botsford LW, Warner RR. 2004. Trajectories and correlates of community change in no-take marine reserves. *Ecological Applications*. 14(6):1709-1723.
- MLPA Science Advisory Team. 2008. Methods used to evaluate marine protected area proposals in the north central coast study region. Marine Life Protection Act Initiative, May 30, 2008 revised draft.
- MLPA Science Advisory Team. 2009. Methods used to evaluate marine protected area proposals in the north central coast study region. Marine Life Protection Act Initiative, October 26, 2009 revised draft.



- MLPA Science Advisory Team. 2011. Methods used to evaluate marine protected area proposals in the north central coast study region. Marine Life Protection Act Initiative, January 13, 2011 revised draft.
- Pacific Fishery Management Council. 2016. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery. August 2016.
- Pastorok RA, Bilyard GR. 1985. Effects of sewage pollution on coral-reef communities. *Marine Ecology Progress Series*. 21:175-189.
- Saarman ET, Gleason M, Ugoretz J, Airamé S, Carr MH, Fox E, Frimodig A, Mason T, Vasques J. 2013. The role of science in supporting marine protected area network planning and design in California. *Ocean Coast Manag.* 74:45-56.
- Starr RM, Wendt DE, Barnes CL, Marks CI, Malone D, Waltz G, Yochum N. 2015. Variation in Responses of Fishes across Multiple Reserves within a Network of Marine Protected Areas in Temperate Waters. *PLOS ONE*. 10(3):e0118502.
- White J, Scholz A, Rassweiler A, Steinback C, Botsford L, Kruse S, Costello C, Mitarai S, Siegal D, Drake P, Edwards C. 2013. A Comparison of Approaches Used for Economic Analysis in Marine Protected Area Network Planning in California. *Ocean & Coastal Management*. 74:77-89.
- White JW, Nickols KJ, Malone D, Carr MH, Starr RM, Cordoleani F, Botsford LW. 2016. Fitting state-space integral projection models to size-structured time series data to estimate unknown parameters. *Ecological Applications*. 26(8):2677-2694.

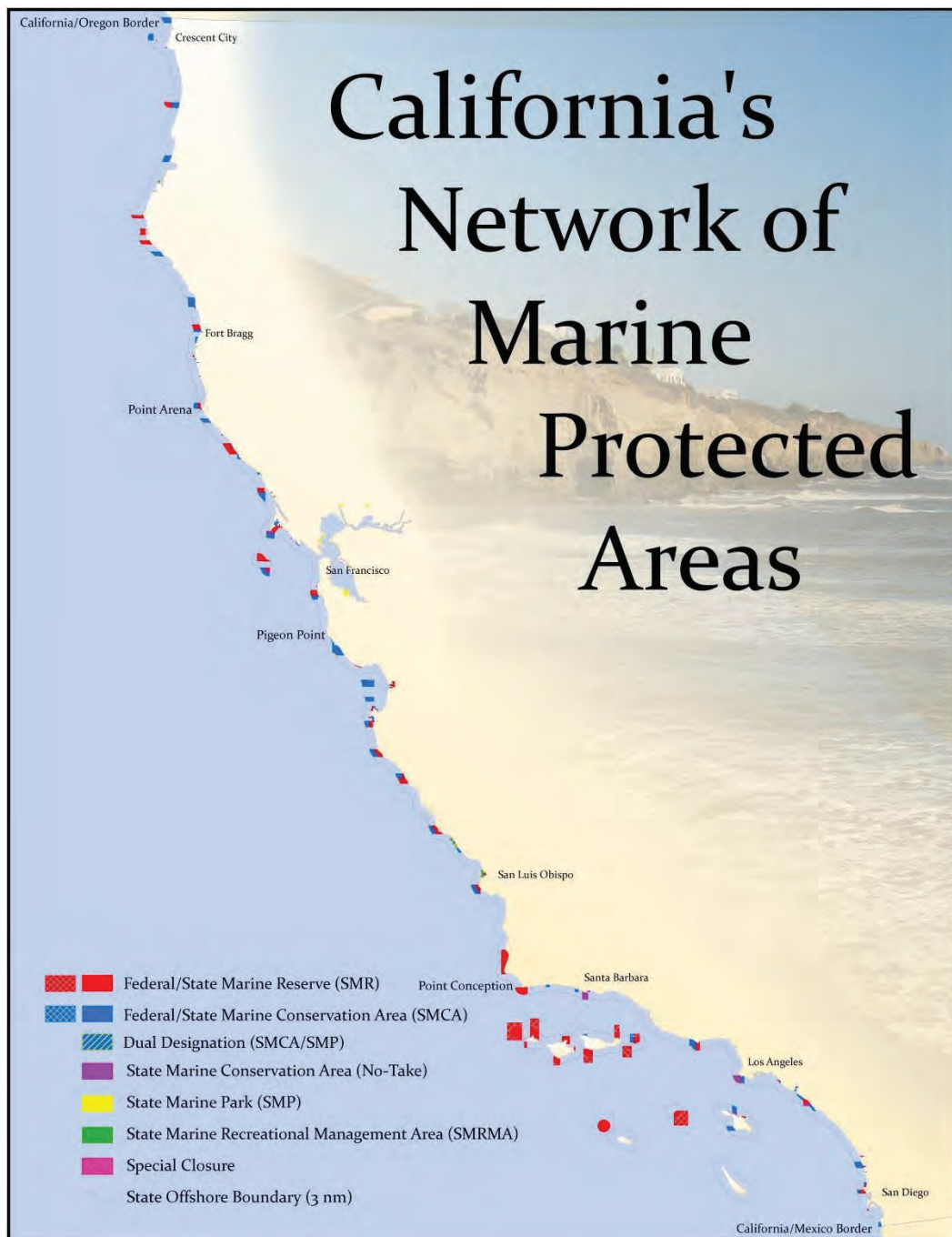
Appendix G:

**PROCEEDINGS OF  
THE MARINE PROTECTED  
AREA SITE SELECTION  
WORKSHOP**

# Proceedings of the Marine Protected Area Site Selection Workshop

January 12, 2018

Long Marine Lab, University of California, Santa Cruz



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## Executive Summary

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California’s marine protected areas (MPAs) were designed to function as a cohesive and ecologically connected network, pursuant to the Marine Life Protection Act (MLPA).<sup>1</sup> The MLPA also requires that the network be monitored to evaluate progress towards meeting the MLPA goals and to inform adaptive management.<sup>2</sup> As a first step, the state implemented Phase 1 of the Statewide MPA Monitoring Program (2007 – 2018) to conduct regional baseline monitoring near the time of MPA implementation. Baseline monitoring established a comprehensive benchmark of ecological and socioeconomic conditions across the state, and provided an important set of data against which future MPA performance can be measured.<sup>3</sup> Building on Phase 1, the California Department of Fish and Wildlife (CDFW) and California Ocean Protection Council (OPC) are developing priorities and strategies for Phase 2, statewide long-term monitoring. A Statewide MPA Monitoring Action Plan (Action Plan) is now under development by CDFW and OPC to prioritize MPA index sites, and ecological and socioeconomic indicators for long-term monitoring, and to help guide cost-effective spending and funding for future monitoring projects. The Action Plan will aggregate monitoring recommendations presented in Phase 1 regional MPA monitoring plans and technical reports with novel quantitative and expert informed approaches for long-term monitoring.

On January 12, 2018, CDFW and OPC convened a workshop titled “Marine Protected Area Site Selection” with collaborating researchers to discuss and develop recommendations and a shared understanding to inform the development of the Action Plan, including approaches for long-term monitoring design, detecting potential MPA effects, and predicting MPA effectiveness over time. Workshop participants identified core priorities for integrating discussed approaches to inform the Action Plan, and important next steps. Presentations and topics centered around:

- 1) Incorporating MPA design features and long-term monitoring datasets into site selection criteria
- 2) Monitoring that accounts for fisheries sustainability and ecosystem integrity goals
- 3) Using the state space integration projection model (SSIPM) to estimate fishing mortality rates to set expectations for population responses
- 4) Using spatial point process models for benthic visual survey and sampling design
- 5) Continued facilitation of a Regional Oceanographic Modeling System (ROMS) to estimate network connectivity

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<sup>1</sup> California Fish and Game Code (FGC) §2850-2863.

<sup>2</sup> FGC §2853(c)(3). See also FGC §2852(a) and §2856(a)(2)(H).

<sup>3</sup> CDFW. (2016). [California Marine Life Protection Act Master Plan for Marine Protected Areas](#). Adopted by the California Fish and Game Commission on August 24, 2016.





## Overview

California has adopted a two-phase approach to MPA monitoring through the statewide MPA Monitoring Program to track the ecological and socioeconomic conditions across the MPA network. Regional baseline monitoring (Phase 1) established a comprehensive benchmark of ecological and socioeconomic conditions at or near the time of MPA implementation in each of four regions across the state including the central coast, north central coast, south coast, and north coast (Table 1). Phase 1 monitoring occurred from 2007 – 2018, and included 37 state-funded regional projects across the state (Table 1).

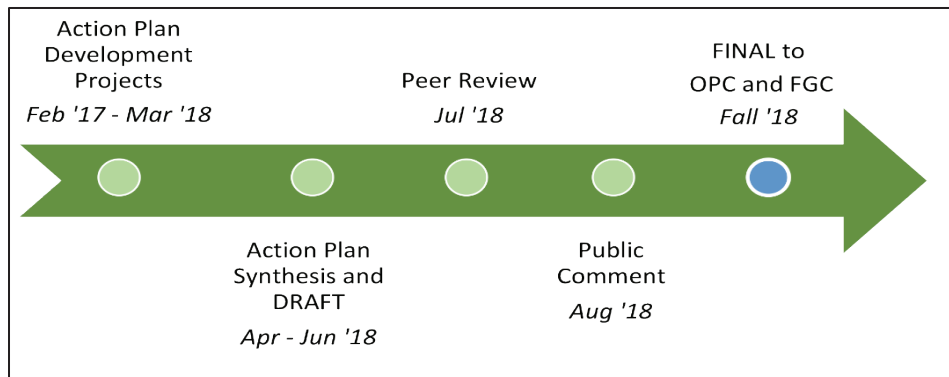
**Table 1. Phase 1 regional baseline monitoring, including the number of regional projects, data collection period, analysis and sharing information period, and initial 5-year management review.**

Coastal Region	Number of Projects	Collect Data	Analyze, Synthesize & Share Information	5-year Management Review
Central	5	2007 - 2010	2010 - 2013	2013
North Central	11	2010 - 2012	2012 - 2016	2016
South	10	2011 - 2013	2013 - 2017	2017
North	11	2014 - 2016	2016 - 2018	2018

Beginning in 2016, California is now designing and implementing statewide long-term monitoring (Phase 2) to reflect current priorities and management needs across agencies and mandates. Since it is unfeasible to monitor every one of California's MPAs each year due to limitations of cost and time, the MLPA calls for "monitoring, research, and evaluation at selected sites to facilitate adaptive management of MPAs..."<sup>4</sup> Reference planning for Phase 2 includes drawing from Phase 1 to stitch together data and priorities on a statewide scale. Building long-term datasets at monitoring index sites using practical, cost-efficient and standardized ecological indicators over sufficient time and geographic scale is necessary to evaluate MPA network performance, inform adaptive management decisions, and ensure that the MPA network is meeting the goals of the MLPA. To help further guide implementation of Phase 2 monitoring and cost-effective spending, CD and PWC are developing the Action Plan, beginning in early 2018 and anticipated for completion<sup>9</sup> Fall 2018 (Figure 1).

<sup>4</sup> FGC §2853(c)(3)





**Figure 1. Draft timeline for Action Plan development and review.**

The Action Plan will:

- 1) Be developed in a manner that is scientifically rigorous and builds on the local knowledge, capacity, and unique considerations from the MPA planning process and Phase 1 monitoring.
  - a. E.g. MPA scientific design factors: “State of the Region” summary reports<sup>5,6,7,8</sup> and CDFW’s management recommendations regarding the first five years of regional MPA implementation,<sup>9</sup> and final technical report for each of the 37 individual regional basins projects.<sup>10</sup>
- 2) Incorporate quantitative and expert informed approaches to help prioritize MPA in existing ecological and socioeconomic indicators and/or sampling design criteria for Phase 2.
  - a. E.g., University of California, San Cruz UCC ROMS to estimate network connectivity, and analysis by University of California Davis UC)/CDFW post-doc oral research and California Ocean Trust (OST) scientific integration follows
- 3) Guide cost-effectiveness and funding for future monitoring efforts.

Presentations and topics discussed at the January 12, 2018 “MPA Site Selection Workshop” included:<sup>11</sup>

- CDFW’s MPA design factors and monitoring metrics (Appendix B)
- Monitoring California’s MPA network based on multiple objectives for adaptive management (Appendix C)
- Estimating value of local fishing or shellfishery: needed for ocean fisheries (Marine Life Management Act; MLMA) and MPAs (MLPA) (Appendix D)
- Spatial optimization model for nested coastal survey and sampling design (Appendix E)
- Continuous development of the UCSC ROMS to estimate network connectivity

<sup>5</sup> OST and CDFW. (2013). *State of the California Central Coast: Results from Baseline Monitoring of Marine Protected Areas 2007-2012*. California, USA. February 2013. 45 p.

<sup>6</sup> OST and CDFW. (2015). *State of the California North Central Coast: A Summary of the Marine Protected Area Monitoring Program 2010-2015*. California, USA. November 2015. 26 p.

<sup>7</sup> OST, CDFW, and OPC. (2017). *State of the California South Coast: Summary of Findings from Baseline Monitoring of Marine Protected Areas, 2011-2015*. California, USA. March 2017. 60 p.

<sup>8</sup> CDFW, OST, and OPC. (2017). *State of the California North Coast: Summary of Findings from Baseline Monitoring of Marine Protected Areas, 2013-2017*. California, USA. November 2017. 32 p.

<sup>9</sup> Available on CDFW’s website: <https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Research-And-Monitoring>.

<sup>10</sup> Available on California Sea Grant’s website: <https://caseagrant.ucsd.edu/ongoing-projects/mpa-baseline-programs#ResearchSummaries>.

<sup>11</sup> See Appendix A for a more complete list of presentations and topics discussed, and workshop purpose/objectives.





## Presentations and Topics

### 1. CDFW's MPA Design Features and Monitoring Matrices

CDFW has developed matrices and an associated interactive mapping tool to facilitate the process of selecting and prioritizing long-term monitoring sites. Using a points-based system, CDFW demonstrated how priority MPAs were identified using key MPA design features (MPA Features Matrix) and information on historical monitoring conducted within MPAs prior to implementation (MPA Monitoring Matrix). The MPA Features Matrix includes criteria that were identified and evaluated during the MLPA initiative public planning process such as core science design guidelines (e.g., size, habitat representation and replication, levels of protection, etc.;<sup>12</sup> as well as proximity to Areas of Special Biological Significance, and whether MPAs had a historical protected area within its boundaries) (Table 2).

**Table 2. Example of records in the MPA Features Matrix. Abbreviations: level of protection (LOP), Areas of Special Biological Significance (ASBS).**

MPA Name	MPA Size	MPA Size points	Rocky Shores-0.60 Linear Miles	Level of Protection	LoP Multiplier	ASBS % of MPA	ASBS points	Historic v. current size	Historic MPA LoP	TOTAL POINTS
Sea Lion Cove SMCA	0.2	0	1	mod low	0.2	0	0.0	0.00	0	1.2
Saunders Reef SMCA	9.4	1	1	mod low	0.2	12	0.1	0.00	0	2.3
Del Mar Landing SMR	0.2	0	1	very high	1	38%	0.4	0.41	0	2.8
Stewarts Point SMCA	1.2	0	1	low	0	0	0.0	0.00	0	1.0
Stewarts Point SMR	2.1	2	1	very high	1	0	0.0	0.00	0	4.0
Salt Point SMCA	1.8	0	1	mod low	0.2	0	0.0	0.68	0	1.9
Gerstle Cove SMR	0.0	0	0	very high	1	8%	0.8	0.8	0	1.7
Russian River SMRMA	0.4	0	0	very high	1	0	0.0	0.00	0	0.0
Russian River SMCA	0.8	0	0	mod	0.4	0	0.0	0.00	0	0.0
Bodega Head SMR	9.3	1	1	very high	1	3%	0.0	0.0	1	4.1
Cluster - Bodega Head SMCA / Bodega Head SMR	21.7	2	1	mod high	0.6	1	0.0	0.02	0.5	4.1
Bodega Head SMCA	12.3	1	0	mod high	0.6	0	0.0	0.00	0	1.0
Estero Americano SMRMA	0.1	0	0	very high	1	0	0.0	0.00	0	0.0

The MPA Monitoring Matrix includes sampling history for long-term monitoring efforts targeting specific ecosystems, that were uniformly and consistently conducted statewide prior to MLPA implementation, including:

- Rocky intertidal monitoring (Multi-Agency Rocky Intertidal Network biodiversity and field plot data),
- Nearshore (0-30 meter [m] subtidal and kelp forest monitoring (PSC and Reef Check California CC and SCAA data) and
- Mid-depth (30-100 m) remotely operated vehicle (ROV) monitoring (CDFW and Marine Applied Research and Monitoring (MAR))

The years of prior monitoring were tabulated as a time series for a single site within each MPA, and a multiplier was added to each MPA to account for the number of monitoring effort types occurring in each of the three target ecosystems (Table 3)

<sup>12</sup> See Appendix A, Section 4.3 of CDFW. (2016). [California Marine Life Protection Act Master Plan for Marine Protected Areas](#). Adopted by the California Fish and Game Commission on August 24, 2016.



**Table 3. Example of records in the MPA Monitoring Matrix. Abbreviations: rocky intertidal monitoring (RIM), kelp forest monitoring (KFM), mid-depth remotely operated vehicle monitoring (ROV).**

MPA Name	RIM: PS C Diversity	RIM: PS C Fixed	KFM: RCCA	KFM: PS C	ROV	M nitoring His ory P ints	M nitoring Multiplier	TOTAL P INTS
Sea Lion Cove SMCA	3	12	3	2	0	20	2	40
Saunders Reef SMCA	2	2	0	3	1	8	3	2
Del Mar Landing SMR	2	3	0	2	0	7	2	1
Stewarts Point SMCA	0	0	0	2	0	2	1	2
Stewarts Point SMR	1	0	0	2	1	4	3	12
Salt Point SMCA	1	2	1	2	0	6	2	12
Gerstle Cove SMR	2	3	12	0	0	1	2	34
Russian River SMRMA	0	0	0	0	0	0	0	0
Russian River SMCA	1	1	0	0	0	2	1	2
Bodega Head SMR	7	1	0	0	4	28	2	56
Cluster - Bodega Head SMCA / Bodega Head SMR	3.5	8.5	0	0	4	1	2	32
Bodega Head SMCA	0	0	0	0	4	4	1	4
Estero Americano SMRMA	0	0	0	0	0	0	0	0

A third matrix (All Rankings Matrix) was presented which combines final scores from the MPA Features and MPA Monitoring Matrices. The All Rankings Matrix allows for sorting and filtering of either the MPA Features or Monitoring matrices individually and/or a combination of both to observe how MPAs compare against each other on both a regional and statewide basis (Table 4). Lastly, CDFW demonstrated a mapping tool designed to help visualize the matrices in a more user-friendly format. In conjunction with other quantitative tools and approaches presented at the workshop described in the following topics, the matrices and mapping tool will help facilitate long-term MPA monitoring site selection and a likely probability of detecting an ecosystem response to protection over time.

**Table 4. Example of records in the MPA Monitoring Matrix.**

MPA Name	Statewide MPA Features	Statewide MPA Monitoring	Statewide Combo	Regional MPA Features	Regional MPA Monitoring	Regional Combo
Sea Lion Cove SMCA	Group 4	Group 4	Group 4	Group 4	Group 2	Group 3
Saunders Reef SMCA	Group 4	Group 4	Group 4	Group 3	Group 3	Group 3
Del Mar Landing SMR	Group 4	Group 4	Group 4	Group 4	Group 3	Group 4
Stewarts Point SMCA	Group 4	Group 4	Group 4	Group 4	Group 4	Group 4
Stewarts Point SMR	Group 2	Group 4	Group 3	Group 1	Group 3	Group 2
Salt Point SMCA	Group 4	Group 4	Group 4	Group 4	Group 3	Group 4
Gerstle Cove SMR	Group 4	Group 4	Group 4	Group 4	Group 2	Group 3
Russian River SMRMA	Group 4	Group 4	Group 4	Group 4	Group 4	Group 4
Russian River SMCA	Group 4	Group 4	Group 4	Group 4	Group 4	Group 4
Bodega Head SMR	Group 2	Group 3	Group 3	Group 1	Group 1	Group 1
Cluster - Bodega Head SMCA / Bodega Head SMR	Group 3	Group 4	Group 4	Group 3	Group 2	Group 3
Bodega Head SMCA	Group 4	Group 4	Group 4	Group 3	Group 4	Group 4
Estero Americano SMRMA	Group 4	Group 4	Group 4	Group 4	Group 4	Group 4



## 2. Monitoring California's MPA Network Based Multiple Objectives for Adaptive Management

UCD/CDFW post-doctoral researcher and the applicant is leading the collaborative development of an approach for

a) **Timeline of expected fished population responses to California's MPAs:** to inform adaptive management, the applicant and others are setting expectations for species responses to MPAs and comparing those expectations to long-term monitoring data, in order to assess if MPAs are performing as expected. Determining a clear timeline for expectations can aid in the development of a monitoring program that evaluates expectations over realistic time frames for assessing populations responses to MPAs. The applicant and Amann et al. are working on projecting a timeline of fished population responses to MPAs, including 19 species to date (see table 5 and topic 3 below)

**Table 5. Species selected to project a timeline of responses to MPAs.**

Common name	Species name	Family	Maximum Age (years) <sup>13</sup>
Cabezon	<i>Scorpaenichthys marmoratus</i>	Cottidae	1
Elephant greenling	<i>Hexagramus decagrammus</i>	Hexagrammidae	18
Elephant rockfish	<i>Sebastes atrovirens</i>	Scorpaenidae	20
California scorpionfish	<i>Scorpaenopsis diabolus</i>	Scorpaenidae	21
Black & yellow rockfish	<i>Sebastes chrysolaus</i>	Scorpaenidae	22
Lingcod	<i>Ophiodon elongatus</i>	Hexagrammidae	2
Goopher rockfish	<i>Sebastes carnatus</i>	Scorpaenidae	30
Live rockfish	<i>Sebastes rosenblatti</i>	Scorpaenidae	30
Brown rockfish	<i>Sebastes auriculatus</i>	Scorpaenidae	34
Elephant bass	<i>Paralabrax clathratus</i>	Serranidae	34
Blue rockfish	<i>Sebastes mystinus</i>	Scorpaenidae	44
Black rockfish	<i>Sebastes melanops</i>	Scorpaenidae	50
Cocaccio	<i>Sebastes paucispinus</i>	Scorpaenidae	50
California sheephead	<i>Semicossyphus pulcher</i>	Labridae	53
Copper rockfish	<i>Sebastes caurinus</i>	Scorpaenidae	57
Hermion rockfish	<i>Sebastes miniatus</i>	Scorpaenidae	60
Yellowtail rockfish	<i>Sebastes flavidus</i>	Scorpaenidae	64
China rockfish	<i>Sebastes nebulosus</i>	Scorpaenidae	79
Red sea urchin	<i>Mesocentrus fasciatus</i>	Strongylocentrotidae	> 100 <sup>14</sup>

<sup>13</sup> Maximum reported age for the finfish species, according to FishBase (version 10/2017). <http://www.fishbase.org>.

<sup>14</sup> Tagging studies reveal that red sea urchins are long-lived, with large individuals possibly living beyond 100 years; according to Kalvass, P., Rogers-Bennett, L., Barsky, K., and C. Ryan. (2003). [Red sea urchin](#). In: *Status of the Fisheries Report: An Update through 2003* (Eds. Ryan, C. and M. Patyten). California Department of Fish and Game, Marine Region. p. 9-1 to 9-14.



Responses depend, in part, on the level of fishing mortality prior to MPA implementation. An age structured population model was applied to assess the time required to reach final abundance (ie, maximum MPA effect) for each fished species, and the length of time of a potential transient response was assessed using two different connectivity assumptions, an open and closed population model for each fished species. Additionally, populations with variable recruitment were assessed to provide a confidence interval around expected population responses with stochasticity considered. Preliminary estimated timelines are highly variable by species and their associated life history characteristics. For example, preliminary results indicate cabezon which have a maximum age of 13 years, may take 7 years to reach final abundance; while china rockfish which have a maximum lifespan of 9 years, may take 40 years to reach final abundance.

**b) Identifying community level metrics:** To identify indicators of community structure and function, a subsampling method was applied that correlates subsets of species to the full set of known species in the community. This method calculates the dissimilarities using the rarefy-Curtis dissimilarity index for all pairs of sites sampled along the California coast for a given habitat monitored, and then determines the links between sites to assess relationships in space. The minimum number of species that correlate at 95% to the full set of species can then be selected as indicators of community structure (i.e., the minimum number of species to predict 95% of the full community effect). This minimum list of species can be subsequently compared with previous indicators identified from key MPA design aspects (eg, species likely to benefit lists developed by the MLPA Science Advisory Team<sup>15</sup>) and supporting documents from Phase 1 baseline monitoring (eg, regional MPA monitoring plans and baseline technical reports) to effectively learn and adapt on previous work moving forward.

**c) Integrated tiered approach to inform development of the Action Plan:** A tiered approach to identify indicator species can be based on (Figure 2):

- Level of harvest: Species that are directly targeted for harvest or commonly in bycatch or indirectly damaged by fishing methods,
- Life history traits and vulnerability to fishing pressure: Species that may be more vulnerable to fishing pressure and benefit more from protection based on life history traits such as limited adult home range, long life span, and low fecundity,
- Indicators of community structure and function: Species role in the ecosystem as ecological interactors, biogenic habitat, or level of trophic importance, and
- Broad-scale metrics from scientific literature and expert input (eg, biodiversity and climate change indicators).

<sup>15</sup> See Appendix A, Section 4.3 of CDFW. (2016). [California Marine Life Protection Act Master Plan for Marine Protected Areas](#). Adopted by the California Fish and Game Commission on August 24, 2016.



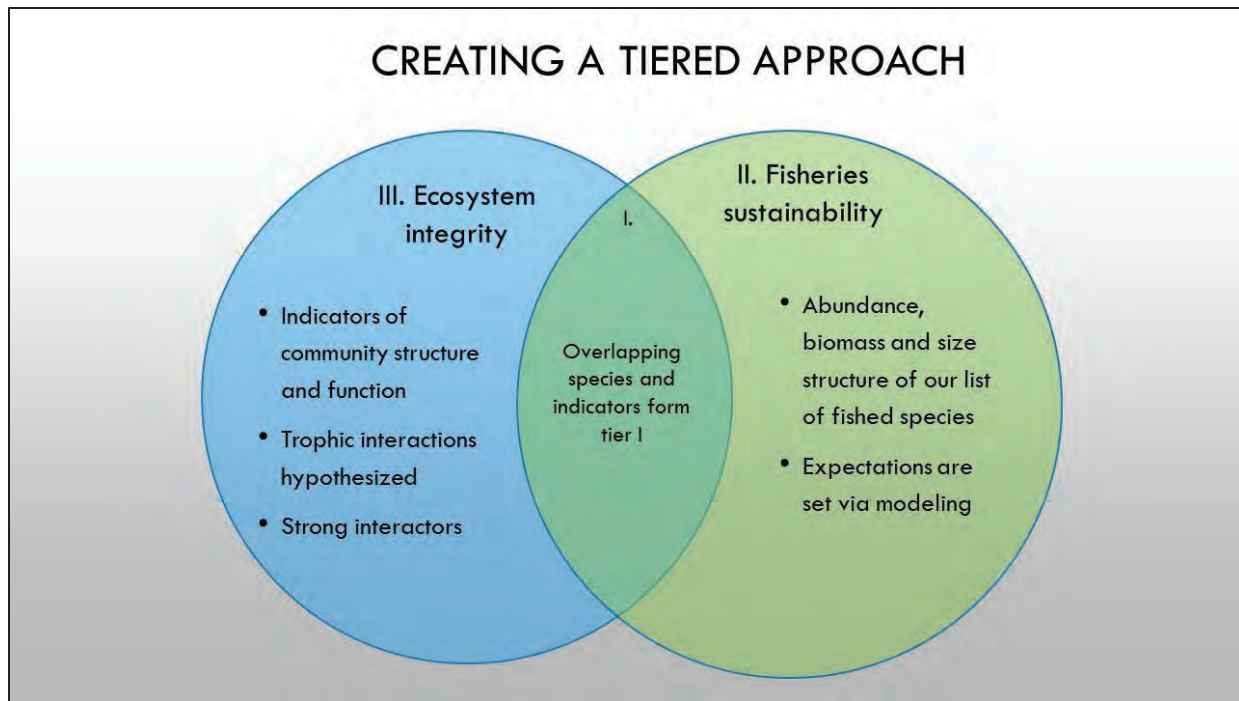


Figure 2. Conceptual schematic for creating an integrated tiered approach to identify indicator species. Tiers are defined in the “Key Outcomes and Next Steps” section.

### 3. Estimating Values of Local Fishing Mortality: Needed for Both Fisheries Management and MPAs

CD /CDFW post-doctoral researcher Lauren Amame is leading the collaborative development of an approach to estimate fishing pressure prior to MPA implementation to provide a better understanding of which species are likely to benefit from protection, and where MPA monitoring would most likely detect the greatest recovery due to protection. Original estimates used blue rockfish as the model indicator species at central coast sites,<sup>16</sup> while recent work has expanded to include south coast sites and more model species. A key challenge for this type of work is getting sufficiently large sample sizes and long data time-series lengths. The following tiered approach was used to determine fishing pressure and inform management decisions:

**a Data-rich scenario:** This scenario applies to species and sites for which the SS PM can be applied to estimate local fishing mortality rates (local  $F$ ). Amame et al. are estimating pre-MPA local  $F$  using the SSPM applied to fisheries-independent data (e.g., PS C, R CCA) for fished species (Table 5). This scenario is useful for identifying indicator species that may be appropriate for evaluation purposes. In general, it is expected that areas with greater historic fishing pressure would yield the highest biomass increases in response to MPAs. Higher local  $F$  generally correlates to increased truncation of size structure and therefore an increased ability to detect the filling in of size structure (Figure 3). Species characteristics resulting in the most precise estimates of local  $F$  include lower natural mortality ( $M$ ) rates

<sup>16</sup> Blue rockfish is the most abundant monitored species, and has a long data time-series length of 9 years pre-MPA implementation.





ii. Higher  $M$  can lead to underestimates of local  $F$  and greater error at growth rate ( $k$ ) exceeding  $M$  (eg,  $k > M$ ), and fished in early life history stages

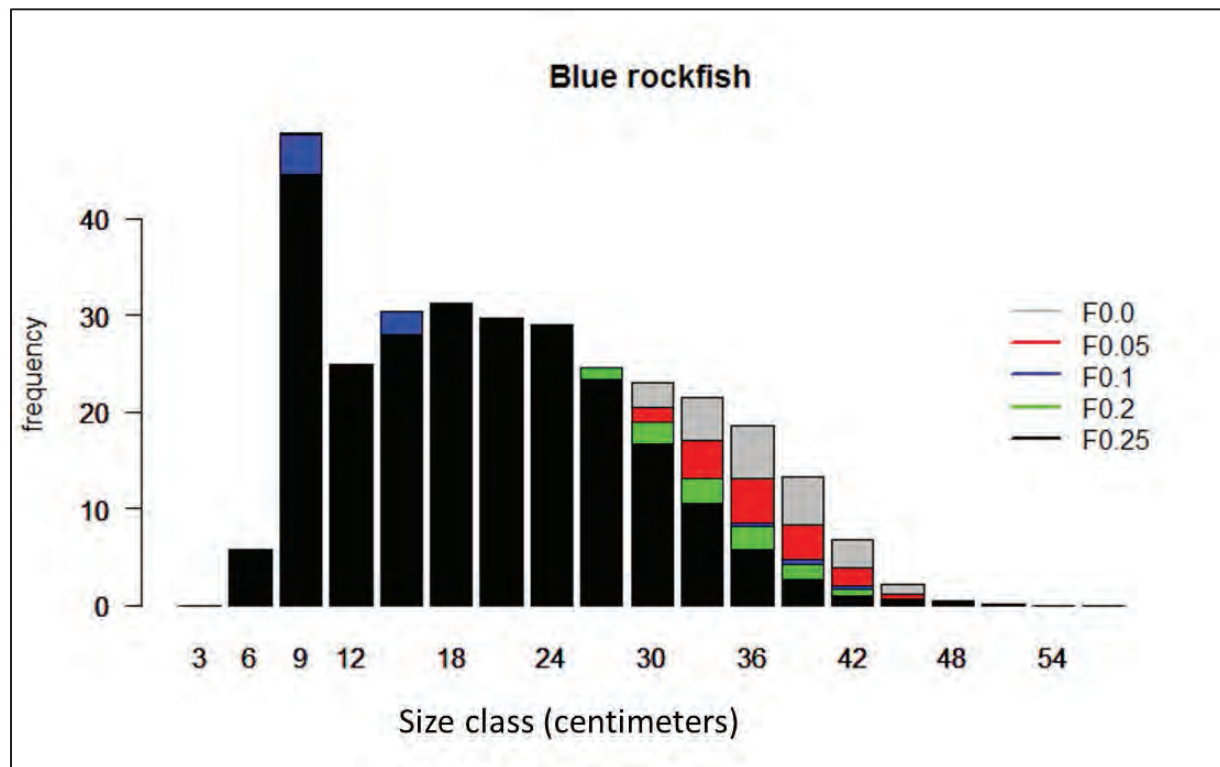


Figure 3. An example of the filling in of size structure for blue rockfish as local increases.

Preliminary results indicate data-rich species with the most reliable estimates of local  $F$  based on biological characteristics include rockfishes (blue, vermillion, copper, yellowtail, kelp, china and red sea urchin); and those with the least reliable estimates of local  $F$  are California scorpionfish, lingcod, cabezon, and kelp greenling. In addition, sites with larger sample sizes (ie, number of fish lengths recorded per MPA and time step) and longer data time-series lengths lead to greater precision of local  $F$  estimates.

**b) Data-moderate scenario:** For those species and datasets which are not conducive for use with the SSPM (eg, important recreational species such as lingcod, cabezon, California scorpionfish, and kelp bass), Amante et al. are estimating more general historical fishing effort across the state with fisheries-dependent data at relatively fine spatial scales. A primary example was presented by Olivia Rhoades, Sfefflow, who is completing an analysis of relative historical fishing effort of private and rental skiff fisheries at a one minute of latitude by one minute of longitude scale using CDFW California Recreational Fisheries Survey data. The project will describe the level of relative fishing effort applied by recreational fishing boats throughout California from 2006 to 2011. This scenario is useful for informing site selection that may be appropriate for evaluation purposes.

**c) Data-poor scenario:** This scenario applies to sites where data-rich or data-moderate information is not available (eg, the California north coast). Amante et al. are estimating regional proxies for historical fishing (eg, proxies such as distance to port, and using data-rich cases to understand data-poor cases), which is potentially useful for informing site selection.



#### 4. Spatial Point Process Model for Benthic Visual Survey and Sampling Design

CD /CDFW post-doctoral researcher Nick Perkins is leading the collaborative development of approaches to analyze and integrate an extensive ROV dataset collected by CDFW and MAR , including:

**a Methods for analyzing ROV data:** Statistical analysis of ROV data is challenging due to data collection along transects and not accounting for spatial autocorrelation, which can lead to bias and errors. However, analysis approaches are rapidly evolving which may lead to robust estimates of species abundance. For example, Perkins et al. are exploring the use of spatial point process models to estimate species abundances within ROV sites and across subtidal rocky reef habitats (e.g., Odegard Head, Año Nuevo, and Pillar Point being developed as case studies). These models incorporate bathymetry-derived covariates (e.g., depth, slope, curvature, rugosity, and other substrate and habitat complexity layers at varying scales) combined with species presence/absence data (Figure 4). This approach can be compared with outputs from other approaches such as design-based estimates, non-spatial generalized linear models and generalized additive models.

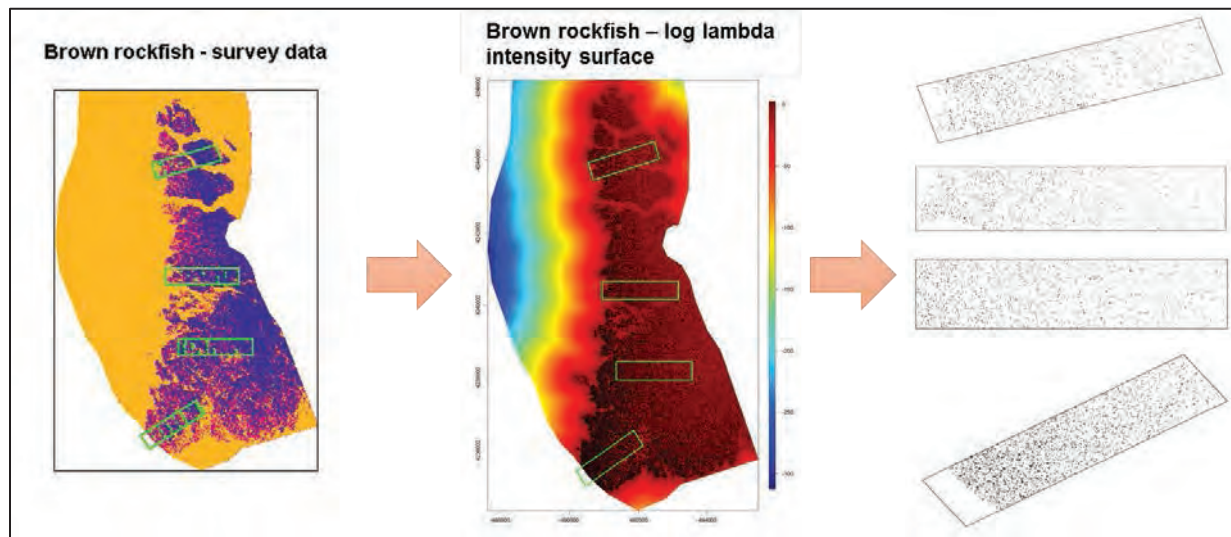


Figure 4. An example of using a spatial point process model to account for the occurrence of brown rockfish individuals in the Bodega Head area (left image), the intensity (i.e., number) of brown rockfish expected to occur in the area given the combination of covariates (middle image), and predicted abundance across the area (right image).

**b) ROV sampling and survey design:** To ensure ROV sampling designs provide high enough statistical power to detect changes, Perkins et al. are incorporating outputs from spatial point process models (see Figure #4a above) to simulate species distributions across sites. These simulations will allow testing of the various sampling designs and levels of effort to evaluate and improve precision of surveys. Also, simulations of changing abundance and/or spatial distributions through time (e.g., using model species and data time-series of expected MPA recovery being worked on by Applin and Amame et al.) will allow exploration of the interaction between sampling design and the statistical power needed to detect change. This will allow the trade-offs between sampling effort and an expected timeline to detect predicted changes to be explored.





**c) Eco-regionalization of subtidal communities:** Previous work has demonstrated that incorporating bioregions into analyses can improve estimates of species recovery, such as providing higher statistical power to detect MPA effects by using R and SC BA datasets, oceanographic (e.g., sea surface temperatures and indices, fronts, chlorophyll a, etc.) and habitat data in 1 kilometer cells; Perkins et al. are developing a regions of common profile (RCP) model to identify which species contribute most out of species groupings and important environmental drivers. The RCP model may be potentially useful for informing site selection by incorporating sampling effects, deriving data-driven maps of eco-regions across the state, and placing MPAs and reference sites in a broader environmental context. Furthermore, the RCP model may aid developing expectations for whether bioregions with similar species assemblages and environmental drivers have similar MPA responses, and whether there is potential to link changes in communities and environmental conditions over time and ensure MPA and reference sites are comparable over time.

## 5. Continued Development of a Regional Oceanographic Modeling System to Integrate Network Connectivity

UCSC researchers Pete Raimondi and Mark Carr are tailoring a ROMS to evaluate larval connectivity of rocky intertidal, shallow rocky reef/kelp forest (0-30m) and deep rock (30-100 m) habitats. The ROMS simulates the movement of planktonic larvae from each 5 kilometer cell under different temporal scenarios with respect to dispersal times, planktonic larval durations (PLDs), and oceanographic conditions, and can be used to determine the effect of PLD on source-sink dynamics, including the relative contribution of larval production and degree of connectivity (Figure 5).

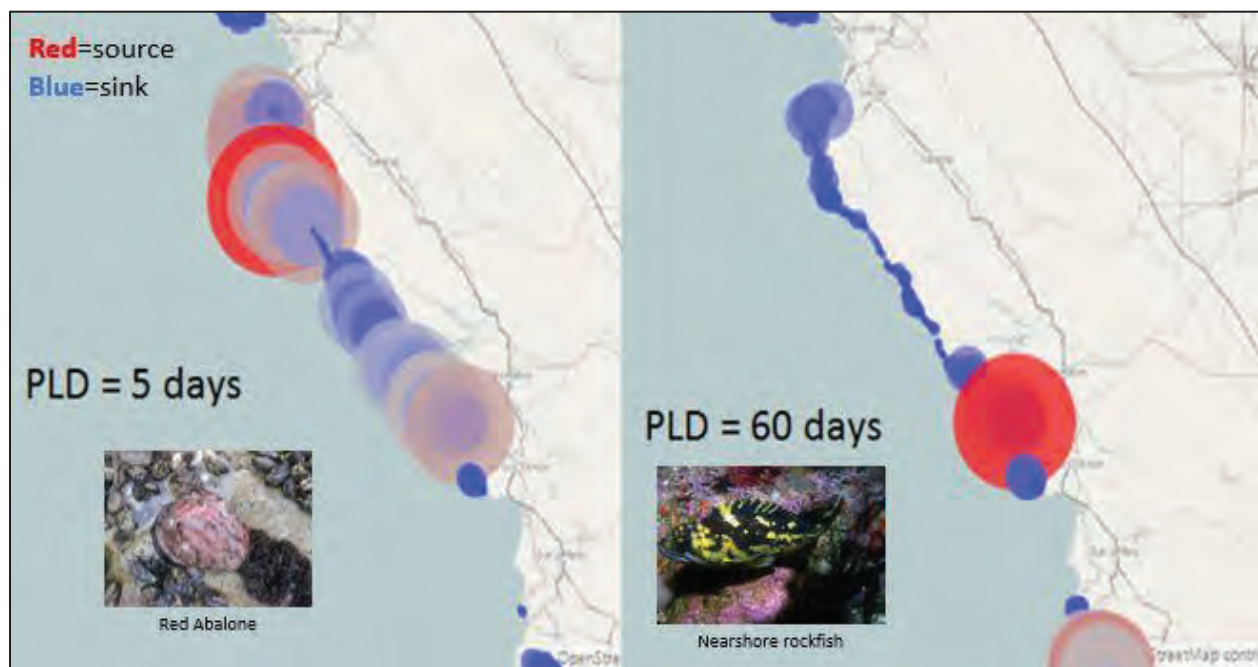


Figure 5. Preliminary results demonstrate the effect of PLD on regional connectivity in central California shallow 0-30m rocky reef/kelp forest habitats for species with a short PLD of 5 days, such as Red Abalone (left), and species with a longer PLD of 60 days, such as Nearshore rockfish (right). Bubble size indicates the degree of connectivity between cells (i.e., relative effect/contribution of larval production), with large bubbles indicating areas of greater connectivity (i.e., source populations). Red bubbles represent larval sources, and blue bubbles represent larval sinks.



Several modifications and improvements were made to the ROMS since a focused ROMS workshop in August 2017.<sup>17</sup> First, in collaboration with CDFW, the mapping and habitat data used in the ROMS has been improved by filling in the shallow, nearshore 0-1 m depth seafloor (“white zone”) along the entire California coast with interpolated data (encompasses a 50-500m wide band of previously unmapped seafloor). Other small or missing areas of unmapped seafloor are now complete. In addition, the topology of ROMS cell relative to MPA boundaries was edited allowing better analysis of MPA vs. non-MPA sites. Continued development of the ROMS includes evaluating the current sensitivity of the model (ie, determine what counts as a connected link), incorporating various levels of protection and geomorphological attributes, and expanding habitat inputs particularly from Oregon and Mexico).

## Key Outcomes & Next Steps

The key outcome is that the January 12, 2018 workshop, convened by CDFW and UCP, provided an important venue to discuss, inform, and facilitate a variety of long-term monitoring approaches and analyses underway. Using these approaches and analyses, the Action Plan will have prioritized long-term monitoring metrics and sites, and guide resource allocation for Phase 2. Workshop participants also determined a tiered approach for determining indicator species, first based on a classification scheme using three groupings. *Group 1* includes fished species exhibiting SSP M high predictability and high response, *Group 2* includes fished species exhibiting SSPM high and medium predictability, high response, and/or a commercially and recreationally important species, and *Group 3* includes ecologically important species.<sup>18</sup> Identifying these groups helped inform a tiered species prioritization method developed following the workshop. Identifying select indicator species will be based on the following three tiers:

- **Tier 1:** Species that experience some level of take, may be good MPA indicators due to certain life history traits, and play a role in ecosystem function
- **Tier 2:** Species that experience some level of take and may be good MPA indicators
- **Tier 3:** Species that experience no level of take, but play a role in ecosystem function

Next steps include vetting species lists through a peer review process, and incorporating expert input. Additionally, UCD/CDFW post-doctoral researchers are tasked with generating estimates of local F for 19 species to see how well they perform by February – early March 2018. Workshop participants will continue to discuss and resolve the tiered approach for determining indicator species, such as fleshing out the vulnerability aspect of *Group 3*. Finally, CDFW was tasked with providing insights for current questions regarding the ROMS model, including:

- Is bioregional representation necessary?
  - CDFW response: Yes. It is important to have good coverage of priority MPAs for long-term monitoring in each bioregion.
- Should regional representation be proportional or not?

<sup>17</sup> CDFW. (2017). *Proceedings of the Regional Ocean Model System Overview Workshop*. University of California, Santa Cruz, August 10-11, 2017. 17 pages.

<sup>18</sup> Identifying *Group 3* species should primarily focus on whether they are functionally important (e.g., high interaction strength, habitat forming, have direct effects on community structure), but also on whether they are vulnerable (e.g., susceptible to climate change, environmental, and fishing impacts).



- CDFW response Our current approach is to pick representative set of MPAs in each bioregion so that the 1 MPAs are distributed relatively evenly across the entire network.
- Should a particular metric be developed to gauge the relative importance of individual locations to supplying propagules of MPAs, to MRS, or to cell lineages?
  - CDFW response To start we would like to see the uppl to els in ene . Once we have the result we can target specific locations inside and outside MPAs.
- Should there be a mix of index sites that include places that are characterized as sources, sinks, and/or a combination of both sources and sinks?
  - CDFW response Ideally, we will prioritize a mix of both sources and sinks in any given region.



## Appendix A: Workshop Agenda

### Marine Protected Areas Site Selection Workshop

January 12, 2018; 8 AM to 4 PM

Long Marine Lab, UC Santa Cruz

Classroom 118, Center for Ocean Health

115 McAllister Way, Santa Cruz CA 95060

#### Workshop Purpose/Objectives:

- Inform the development of MPA site selection for Statewide Monitoring Action Plan. To this effect:
  - Receive updates on analytical approaches to spatial sampling design
  - Discuss and identify the best approaches for detecting MPA effects and predict effectiveness through monitoring
  - Develop recommendations for integrating discussed approaches to inform the Statewide MPA Monitoring Action Plan

Time	ITEM	PRESENTER
8:00 AM	Introductions and Workshop Purpose	Becky Ota Cyndi Dawson
8:15	Presentation and Discussion: update on MLPA Initiative planning and habitat matrix and interactive map	Amanda Van Diggelen
8:45	Presentation and Discussion: update on Regional Oceanographic Modeling System	Peter Raimondi
9:05	Presentation and Discussion: update on spatial point process model for benthic visual survey and sampling design	Nick Perkins
9:25	Presentation and Discussion: update on state space integration projection model	Lauren Yamane
9:45	Presentation Discussion: approaches for monitoring species responses to MPAs and community level metrics	Katie Kaplan
10:05	BREAK	
10:20	Group Discussion and Brainstorm: integration of information	All (plenary)
12:00 PM	LUNCH (lunch will be brought in; bring \$10 cash for food)	
12:30	Continued Group Discussion and Brainstorm	All (plenary)
2:15	BREAK	
2:30	Continued Group Discussion and Brainstorm	All (plenary)
3:30	Overview, reflections, and next steps	Becky Ota
4:00	Adjourn	



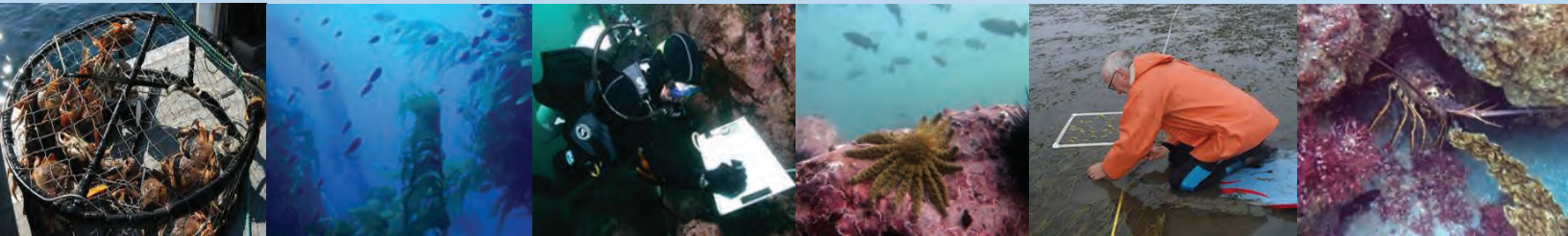




# (Appendix B) CDFW's MPA Features and Monitoring Matrices



Amanda Van Diggelen, Environmental Scientist  
MPA Site Selection Workshop, Santa Cruz, CA  
January 12, 2018



## Matrices

### 1) KeMarine Protected Areas PP ADe sign Features

- MPA size
- Habitat thresholds
- Level of protection (LOP)
- Areas of Special Biological Significance (ASBS)
- Historical MPAs

MPA Name	MPA Size	MPA Size (acres)	Rocky Shores-0.60 Linear Miles	Level of Protection	LOP Multiplier	ASBS % of MPA	ASBS (acres)	Historic v. current size	Historic MPA LoP	TOTAL POINTS
Sea Lion Cove SMCA	0.2	0	1	mod low	0.2	0%	0.0	0.00	0	1.2
Saunders Reef SMCA	9.4	1	1	mod low	0.2	12%	0.1	0.00	0	2.3
Del Mar Landing SMR	0.2	0	1	very high	1	38%	0.4	0.41	0	2.8
Stewarts Point SMCA	1.2	0	1	low	0	0%	0.0	0.00	0	1.0
Stewarts Point SMR	24.1	2	1	very high	1	0%	0.0	0.00	0	4.0
Salt Point SMCA	1.8	0	1	mod low	0.2	0%	0.0	0.68	0	1.9
Gerstle Cove SMR	0.0	0	0	very high	1	84%	0.8	0.87	0	1.7
Russian River SMRMA	0.4	0	0	very high	1	0%	0.0	0.00	0	0.0
Russian River SMCA	0.8	0	0	mod	0.4	0%	0.0	0.00	0	0.0
Bodega Head SMR	9.3	1	1	very high	1	3%	0.0	0.05	1	4.1
Cluster - Bodega Head SMCA / Bodega Head SMR	21.7	2	1	mod high	0.6	1%	0.0	0.02	0.5	4.1
Bodega Head SMCA	12.3	1	0	mod high	0.6	0%	0.0	0.00	0	1.0
Estero Americano SMRMA	0.1	0	0	very high	1	0%	0.0	0.00	0	0.0



# Matrices

## MPA Monitoring

- Rocky Intertidal (RIM)
  - Partnership for the Interdisciplinary Study of Coastal Oceans (PISCO)
- Kelp Forest (0-30m; KFM)
  - Reef Check California (RCCA)
  - PISCO
- Mid-depth rock (30-100m; ROV)
  - Department of Fish and Wildlife
  - Marine Applied Research and Monitoring

MPA Name	RIM: PS C Diversity	RIM: PS C Fixed	KFM: RCCA	KFM: PS C	ROV	Monitoring History Points	Monitoring Multiplier	TOTAL POINTS
Sea Lion Cove SMCA	3	12	3	2	0	20	2	40
Saunders Reef SMCA	2	2	0	3	1	8	3	24
Del Mar Landing SMR	2	3	0	2	0	7	2	14
Stewarts Point SMCA	0	0	0	2	0	2	1	2
Stewarts Point SMR	1	0	0	2	1	4	3	12
Salt Point SMCA	1	2	1	2	0	6	2	12
Gerstle Cove SMR	2	3	12	0	0	17	2	34
Russian River SMRMA	0	0	0	0	0	0	0	0
Russian River SMCA	1	1	0	0	0	2	1	2
Bodega Head SMR	7	17	0	0	4	28	2	56
Cluster - Bodega Head SMCA / Bodega Head SMR	3.5	8.5	0	0	4	16	2	32
Bodega Head SMCA	0	0	0	0	4	4	1	4
Estero Americano SMRMA	0	0	0	0	0	0	0	0



# Matrices

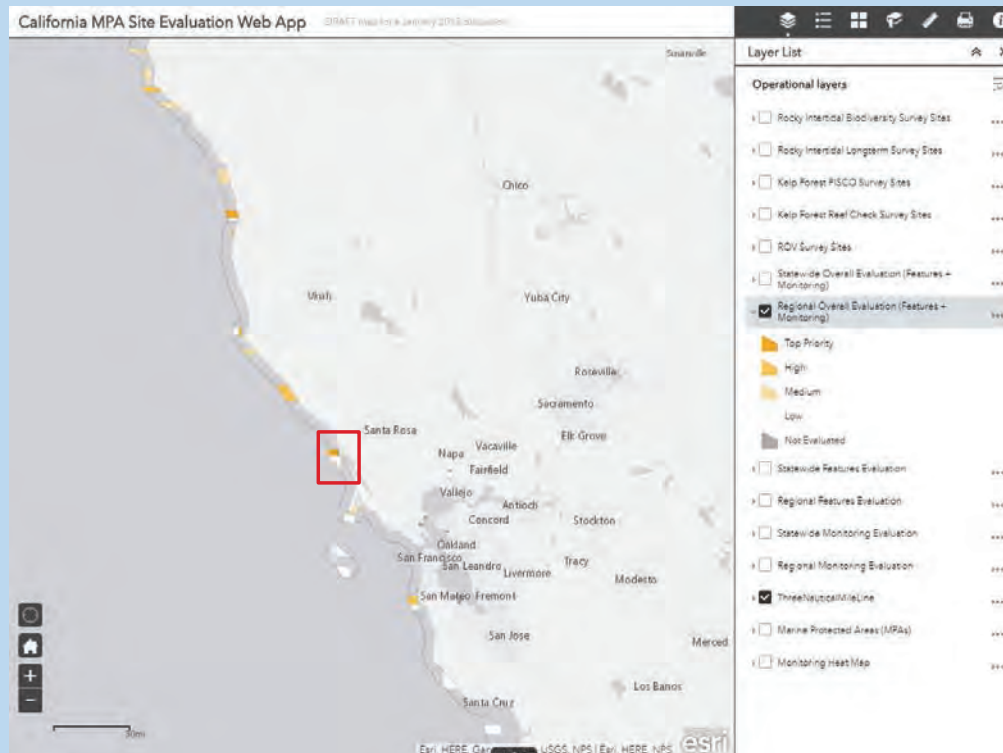
1) MPA Features + 2) MPA Monitoring = 3) Aligning

- Final MPA siting priorities

MPA Name	Statewide MPA Features	Statewide MPA Monitoring	Statewide Combo	Regional MPA Features	Regional MPA Monitoring	Regional Combo
Sea Lion Cove SMCA	4 Low	4 Low	4 Low	4 Low	2 High	3 Medium
Saunders Reef SMCA	4 Low	4 Low	4 Low	3 Medium	3 Medium	3 Medium
Del Mar Landing SMR	4 Low	4 Low	4 Low	4 Low	3 Medium	4 Low
Stewarts Point SMCA	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low
Stewarts Point SMR	2 High	4 Low	3 Medium	1 Priority	3 Medium	2 High
Salt Point SMCA	4 Low	4 Low	4 Low	4 Low	3 Medium	4 Low
Gerstle Cove SMR	4 Low	4 Low	4 Low	4 Low	2 High	3 Medium
Russian River SMRMA	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low
Russian River SMCA	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low
Bodega Head SMR	2 High	3 Medium	3 Medium	1 Priority	1 Priority	1 Priority
Cluster - Bodega Head SMCA / Bodega Head SMR	3 Medium	4 Low	4 Low	3 Medium	2 High	3 Medium
Bodega Head SMCA	4 Low	4 Low	4 Low	3 Medium	4 Low	4 Low
Estero Americano SMRMA	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low

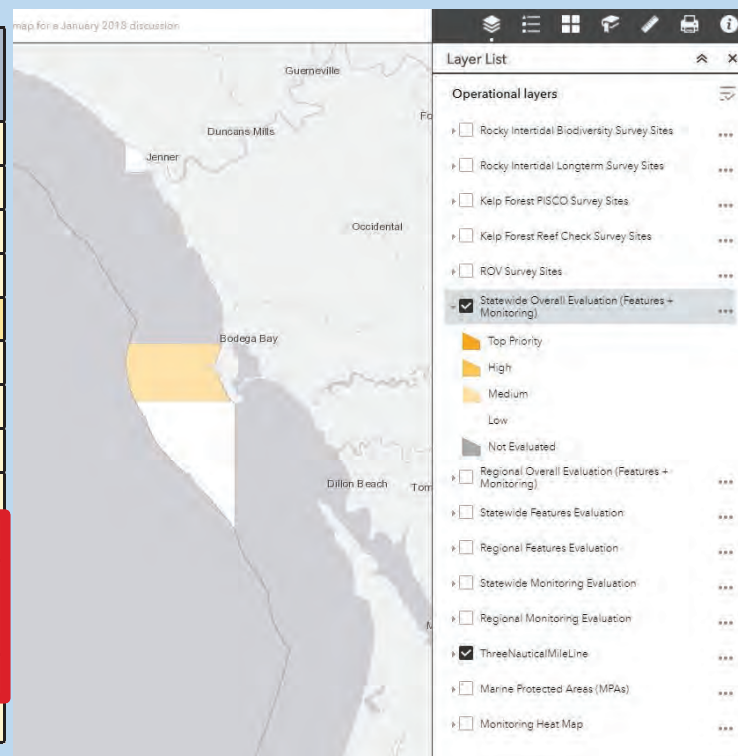


# Interactive Mapping Tool



## Mapping Tool and Matrix

MPA Name	Statewide Features	Statewide Monitoring	Statewide Combo
Sea Lion Cove SMCA	4 Low	4 Low	4 Low
Saunders Reef SMCA	4 Low	4 Low	4 Low
Del Mar Landing SMR	4 Low	4 Low	4 Low
Stewarts Point SMCA	4 Low	4 Low	4 Low
Stewarts Point SMR	2 High	4 Low	3 Med
Salt Point SMCA	4 Low	4 Low	4 Low
Gerstle Cove SMR	4 Low	4 Low	4 Low
Russian River SMRMA	4 Low	4 Low	4 Low
Russian River SMCA	4 Low	4 Low	4 Low
Bodega Head SMR	2 High	3 Med	3 Med
Cluster - Bodega Head SMCA / Bodega Head SMR	3 Med	4 Low	4 Low
Bodega Head SMCA	4 Low	4 Low	4 Low
Estero Americano SMRMA	4 Low	4 Low	4 Low

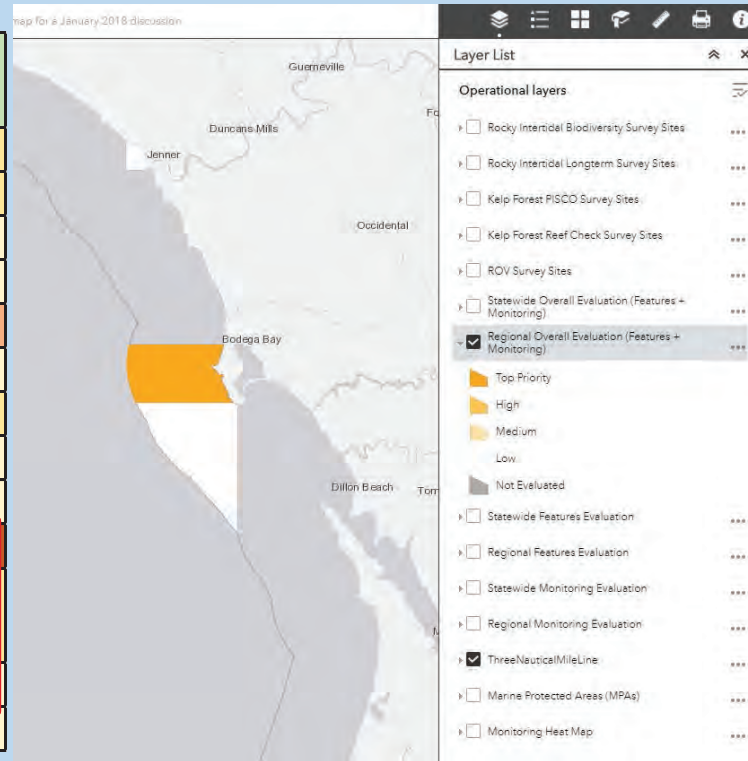






# Mapping Tool and Matrix

MPA Name	Regional Features	Regional Monitoring	Regional Combo
Sea Lion Cove SMCA	4 Low	2 High	3 Med
Saunders Reef SMCA	3 Med	3 Med	3 Med
Del Mar Landing SMR	4 Low	3 Med	4 Low
Stewarts Point SMCA	4 Low	4 Low	4 Low
Stewarts Point SMR	1 Priority	3 Med	2 High
Salt Point SMCA	4 Low	3 Med	4 Low
Gerstle Cove SMR	4 Low	2 High	3 Med
Russian River SMRMA	4 Low	4 Low	4 Low
Russian River SMCA	4 Low	4 Low	4 Low
Bodega Head SMR	1 Priority	1 Priority	1 Priority
Cluster - Bodega Head SMCA / Bodega Head SMR	3 Med	2 High	3 Med
Bodega Head SMCA	3 Med	4 Low	4 Low
Estero Americano SMRMA	4 Low	4 Low	4 Low



# Potential Sites Example

CONFIDENTIAL Do Not Distribute		IMPORTANT: ALWAYS SORT THIS A TO Z AFTER OTHER FILTERS ARE USED IN ORDER TO LOOK AT PRIORITIES BY REGION																
MPA Name	Region	MPA Group	MPA Survey Group	MPA type	Final_Monitoring Priority STATEWIDE (Priority: top 10; high: top 20; medium: top 40; low: remaining)	Final_MPA Features Priority STATEWIDE (Priority: top 10; high: top 20; medium: top 40; low: remaining)	Final_Combio Priority STATEWIDE (Priority: Priority & Priority; High Priority & High & High & High; Medium: High & Med or Med & Med; Low: Med & Low or Low & Low)	Final_Monitoring Priority REGIONAL (Priority: top 2; high: top 5; medium: top 15; low: remaining)	Final_MPA Features Priority REGIONAL (Priority: top 2; high: top 5; medium: top 15; low: remaining)	Final_Combio Priority REGIONAL (Priority: Priority & Priority; High Priority & High or High & High; Medium: High & Med or Med & Med; Low: Med & Low or Low & Low)	ROV Monitoring	KF Monitoring	RI Monitoring	Site Selection Justification				
Cluster - Point Arena SMCA / Point Arena SMR	2 North Central	Cluster	NCC1	Coastal	4 Low	3 Medium	4 Low	3 Medium	3 Medium	3 Medium	Yes	Yes	Yes	This cluster is limited for SMR vs SMC. This SMCA will only support ROV res location and monitor only the SMR site. Small MPA adjacent to an SMR that based kelp forest and rocky intertidal. Choose this site since it closes the gap this is a potential site that can be suit Same as row 11 information.				
Point Arena SMCA	2 North Central	Single	NCC1	Coastal	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low	Yes	No	No					
Sea Lion Cove SMCA	2 North Central	Single	NCC1	Coastal	4 Low	4 Low	4 Low	2 High	4 Low	3 Medium	No	Yes	Yes					
Salt Point SMCA	2 North Central	Single	NCC2	Coastal	4 Low	4 Low	4 Low	3 Medium	4 Low	4 Low	No	Yes	Yes					
Gerstle Cove SMR	2 North Central	Single	NCC2	Coastal	4 Low	4 Low	4 Low	3 Medium	4 Low	4 Low	No	Yes	Yes					
Bodega Head SMR	2 North Central	Single	NCC3	Coastal	3 Medium	2 High	3 Medium	1 Priority	1 Priority	1 Priority	Yes	No	Yes	This is the highest ranking MPA in the region, but doesn't have any KFM data. The Bodega cluster will be useful for comparison.				
Cluster - Bodega Head SMCA / Bodega Head SMR	2 North Central	Cluster	NCC3	Coastal	4 Low	3 Medium	4 Low	2 High	3 Medium	3 Medium	Yes	No	Yes					
Bodega Head SMCA	2 North Central	Single	NCC3	Coastal	4 Low	4 Low	4 Low	4 Low	3 Medium	4 Low	Yes	No	No	The SMCA is primarily offshore and doesn't have KFM data available as well, this is a potential site that can be suit Same as row 11 information.				
Montara SMR	2 North Central	Single	NCC4	Coastal	4 Low	3 Medium	4 Low	2 High	2 High	2 High	Yes	Yes	Yes	This MPA has had previous monitoring. The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Cluster - Pillar Point SMCA / Montara SMR	2 North Central	Cluster	NCC4	Coastal	4 Low	3 Medium	4 Low	3 Medium	2 High	3 Medium	Yes	Yes	No	May consider dropping the cluster as a medium priority in the region. Same as row 17 information.				
Pillar Point SMCA	2 North Central	Single	NCC4	Coastal	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low	Yes	No	No					
Natural Bridges SMR	3 Central	Single	CC1	Coastal	2 High	4 Low	3 Medium	3 Medium	4 Low	4 Low	No	Yes	Yes	This site will help close the spacing gap. This MPA has had previous monitoring. The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Carmel Bay SMCA	3 Central	Single	CC2	Coastal	1 Priority	4 Low	3 Medium	1 Priority	3 Medium	2 High	Yes	Yes	Yes	The PI Sur cluster will be useful for comparison. The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Point Lobos SMR	3 Central	Single	CC2	Coastal	1 Priority	2 High	2 High	1 Priority	3 Medium	2 High	Yes	Yes	Yes	The PI Sur cluster will be useful for comparison. The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Cluster - Point Lobos SMCA / Point Lobos SMR	3 Central	Cluster	CC2	Coastal	2 High	2 High	2 High	3 Medium	3 Medium	3 Medium	Yes	Yes	Yes	This is a highest state priority site, has the PI Sur cluster will be useful for comparison. The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Point Lobos SMCA	3 Central	Single	CC2	Coastal	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low	Yes	No	No	The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Point Sur SMR	3 Central	Single	CC3	Coastal	1 Priority	2 High	2 High	2 High	3 Medium	3 Medium	Yes	Yes	Yes	This is a highest state priority site, has the PI Sur cluster will be useful for comparison. The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Cluster - Point Sur SMCA / Point Sur SMR	3 Central	Cluster	CC3	Coastal	3 Medium	2 High	3 Medium	3 Medium	2 High	3 Medium	Yes	Yes	Yes	The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Point Sur SMCA	3 Central	Single	CC3	Coastal	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low	Yes	No	No	The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Piedras Blancas SMR	3 Central	Single	CC4	Coastal	2 High	1 Priority	2 High	2 High	2 High	2 High	Yes	Yes	Yes	This SMR has all three types of monitoring. The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Cluster - Piedras Blancas SMCA / Piedras Blancas SMR	3 Central	Cluster	CC4	Coastal	4 Low	1 Priority	3 Medium	4 Low	1 Priority	3 Medium	Yes	Yes	Yes	This cluster is limited for SMR vs SMC. The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Piedras Blancas SMCA	3 Central	Single	CC4	Coastal	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low	Yes	No	No	The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Point Buchon SMR	3 Central	Single	CC5	Coastal	3 Medium	3 Medium	3 Medium	3 Medium	3 Medium	3 Medium	Yes	Yes	Yes	This SMR has all three types of monitoring. The SMCA is offshore and doesn't have KFM data available as well, this is a potential site that can be suit Adjacent to an SMR that prohibits tal forest and rocky intertidal monitoring. This is a highest state priority site, has the PI Sur cluster will be useful for comparison.				
Cluster - Point Buchon SMCA / Point Buchon SMR	3 Central	Cluster	CC5	Coastal	4 Low	2 High	3 Medium	4 Low	2 High	3 Medium	Yes	Yes	Yes	Recommend keeping this cluster to suit. Flagging for Sara, this is an offshore site. Monitoring data for all three surveys in 2019. Justify site selection. Does not have RIM data available but 2019 data.				
Point Buchon SMCA	3 Central	Single	CC5	Coastal	4 Low	4 Low	4 Low	4 Low	4 Low	4 Low	Yes	No	Yes					
Campus Point SMCA	4 South	Single	SC1	Coastal	1 Priority	1 Priority	1 Priority	2 High	3 Medium	3 Medium	Yes	Yes	Yes					
Harris Point SMR	4 South	Single	SC2	Coastal	1 Priority	1 Priority	1 Priority	1 Priority	1 Priority	1 Priority	Yes	Yes	Yes					
Anacapa Island SMCA	4 South	Single	SC3	Coastal	3 Medium	4 Low	4 Low	3 Medium	4 Low	4 Low	Yes	Yes	No					



## Questions?



Amanda Van Diggelen  
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(Appendix C)

# MONITORING CALIFORNIA'S MPA NETWORK BASED ON MULTIPLE OBJECTIVES FOR ADAPTIVE MANAGEMENT

JANUARY 12<sup>TH</sup>, 2018

MPA WORKSHOP

# OUTLINE

- I. INTRODUCTION
- II. MLPA GOAL: FISHERIES SUSTAINABILITY
  - RESPONSE OF AN OPEN POPULATION
  - RESPONSE OF A CLOSED POPULATION
- III. MLPA GOAL: ECOSYSTEM STRUCTURE, FUNCTION INTEGRITY
  - DIRECT EFFECTS: TARGETED SPECIES THAT ALSO PLAY A STRONG ROLE IN ECOSYSTEM STRUCTURE/FUNCTION
  - INDIRECT EFFECTS: SPECIES IMPACTED BY FISHED SPECIES (I.E. FOOD WEB DYNAMICS)
  - INDICATORS OF COMMUNITY STRUCTURE THAT ARE NOT AFFECTED BY FISHED SPECIES (I.E. HABITAT FORMING SPECIES)
  - BROAD-SCALE METRICS FROM THE LITERATURE (BIODIVERSITY INDICATORS)
- IV. PUTTING IT ALL TOGETHER INTO ONE APPROACH

## DESIGNING AND IMPLEMENTING A MONITORING PLAN FOR ADAPTIVE MANAGEMENT

- FIRST STEP IS TO DETERMINE EXPECTATIONS OF SPECIES RESPONSES TO MPAS
- THEN LONG-TERM MONITORING EVALUATES IF EXPECTATIONS WERE MET



Figure credit: [http://www.dfg.ca.gov/erp/adaptive\\_management.asp](http://www.dfg.ca.gov/erp/adaptive_management.asp)

## OBJECTIVES

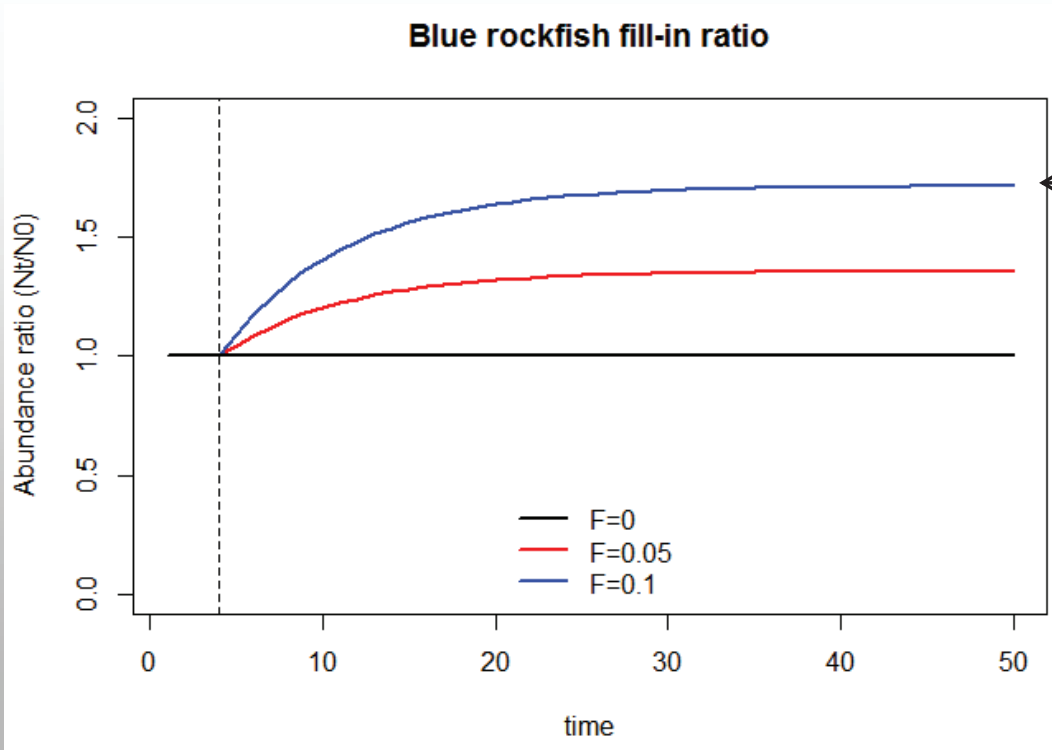
- PROBLEM: EXISTING WORK ON MONITORING SELECTED TOO MANY SPECIES AND INDICATORS TO MONITOR WITHOUT A CLEAR DIRECTION FOR PRIORITIZATION GIVEN A LIMITED BUDGET
- SOLUTION: PROVIDE A METHOD FOR PRIORITIZING INDICATORS BASED ON OVERLAPPING OBJECTIVES OF THE MLPA

## RESPONSES OF FISHED POPULATIONS TO THE IMPLEMENTATION OF THE MLPA

- APPROACH: PROJECT TIMELINE OF FISHED SPECIES RESPONSES TO MPAS
- RESPONSES DEPEND ON LEVEL OF FISHING MORTALITY BEFORE MPA IMPLEMENTATION
  - LAUREN IS USING SSIPM MODEL TO GET SPATIALLY EXPLICIT FISHING MORTALITY RATES
- CURRENTLY ASSESSING TIMELINE OF FISHED POPULATION RESPONSES BASED ON FISHING MORTALITY RATES USED IN STOCK ASSESSMENTS FOR THE 90S AND 2000S



## Final responses depend of prior fishing



Natural mortality rate

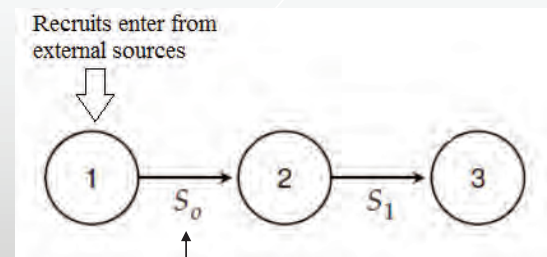
Fishing mortality rate

$$\left\{ \frac{M + F}{M} \right\}$$

## MODELING AN OPEN POPULATION

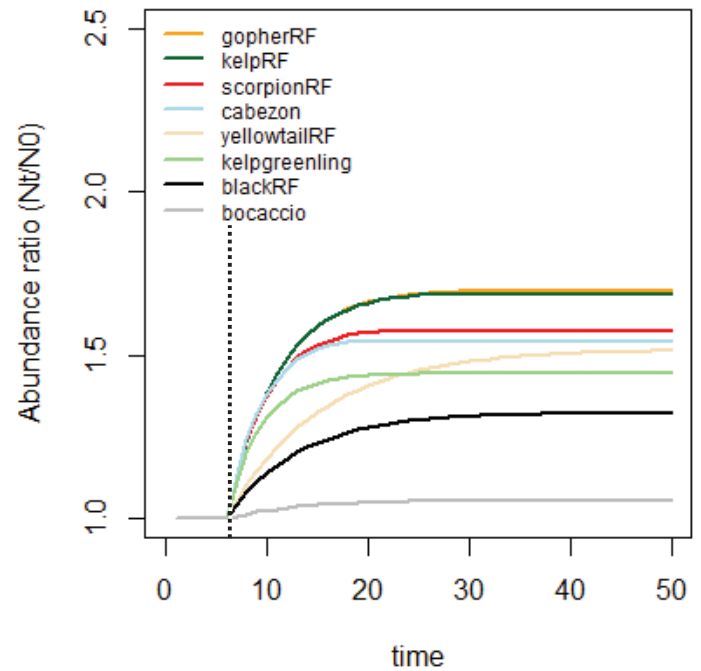
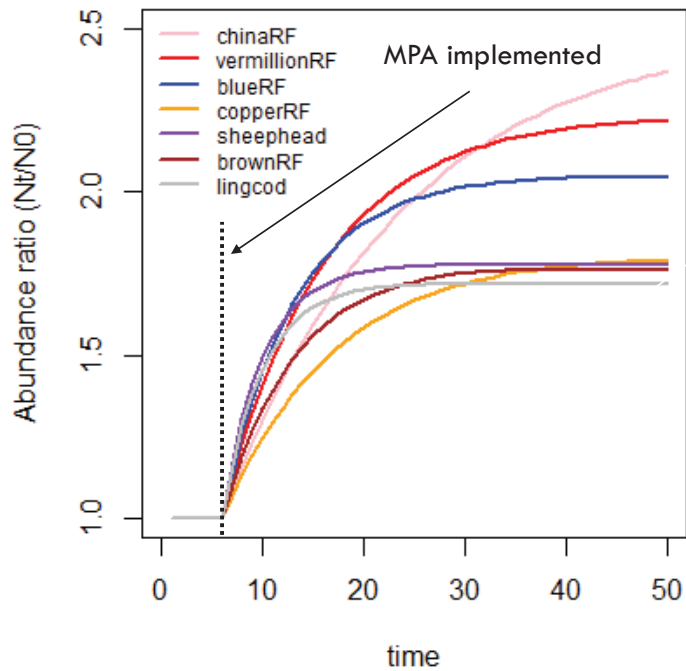
- CONSTRUCT LESLIE MATRIX
- CONSTANT RECRUITMENT ADDED TO THE POPULATION
  - CAN ADD VARIABILITY TO RECRUITMENT
- TO DETERMINE THE POPULATION RESPONSE WE REMOVE  $F$  (FISHING MORTALITY) AND SEE HOW THE ABUNDANCE CHANGES OVER TIME

$$\mathbf{N}_{t+1} = \mathbf{A}\mathbf{N}_t + \mathbf{R},$$

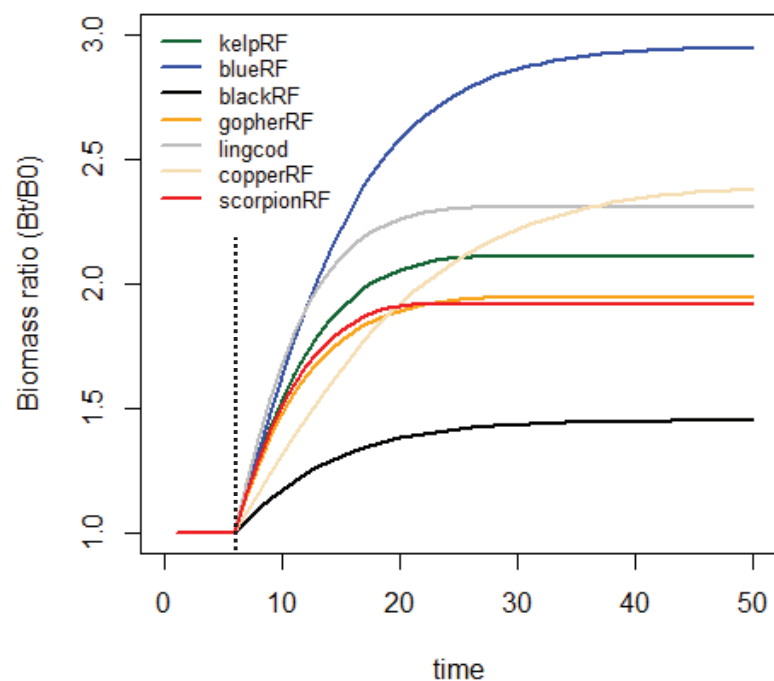
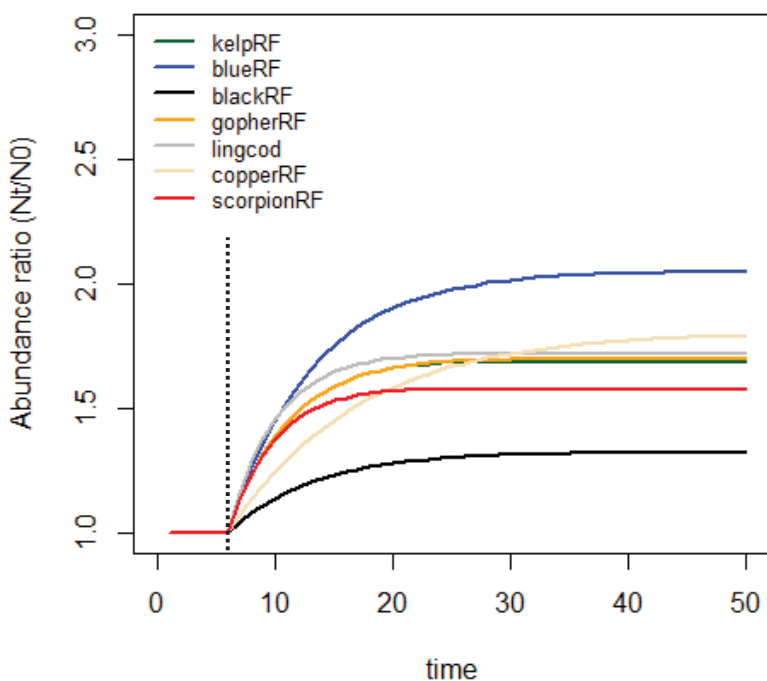


Survivorship to the next age class is based on the fishing mortality ( $F$ ) and natural mortality rate ( $M$ )

## MODELING MPA RESPONSES: ABUNDANCE CHANGES OVER TIME FOR AN OPEN POPULATION

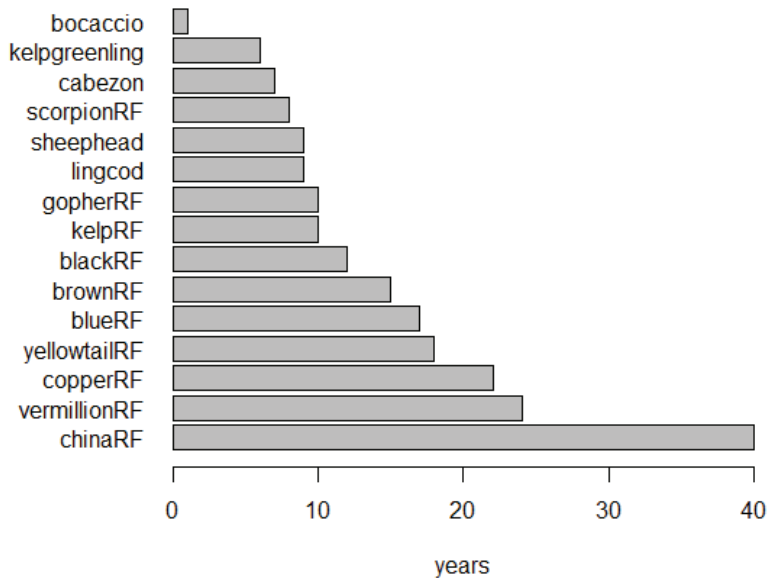


## BIOMASS RATIO INCREASE IS GREATER THAN ABUNDANCE

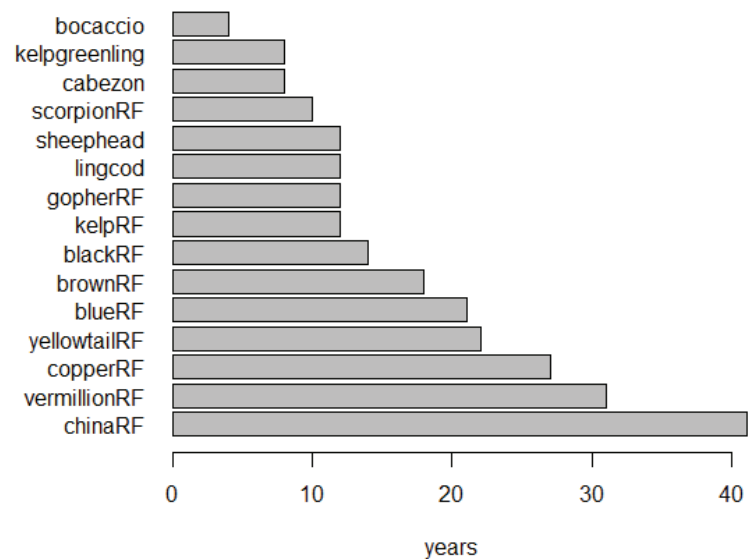


# TIMELINES FOR ABUNDANCE AND BIOMASS USING OPEN POPULATION DETERMINISTIC MODEL

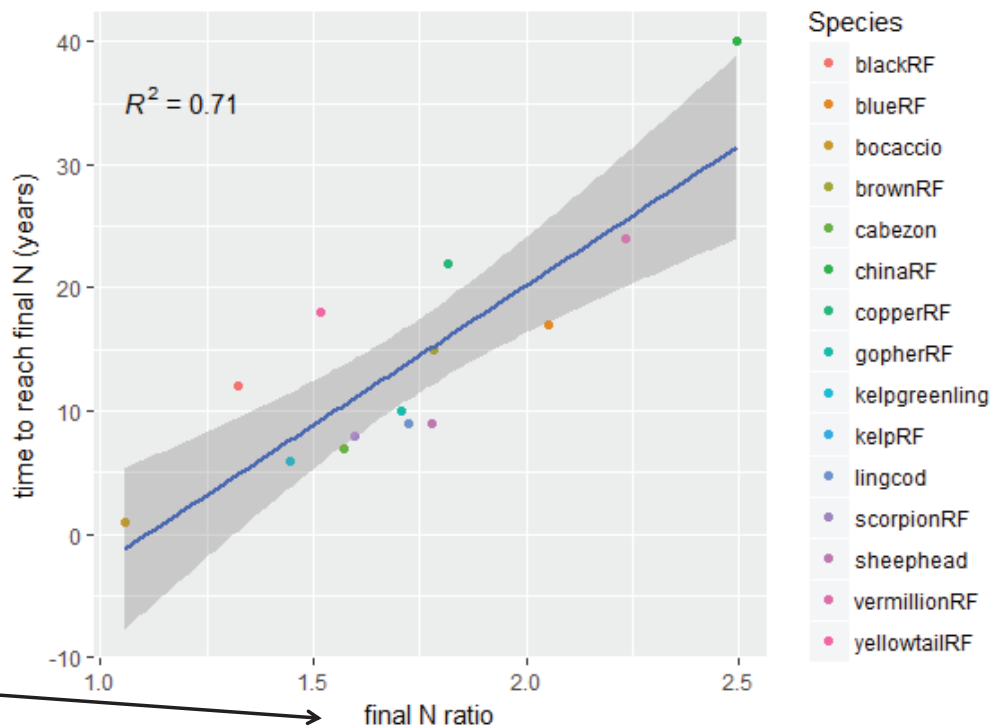
time to reach 95% final abundance ratio



time to reach 95% final biomass ratio



## TIME TO REACH FINAL ABUNDANCE IS CORRELATED TO THE FINAL ABUNDANCE RATIO

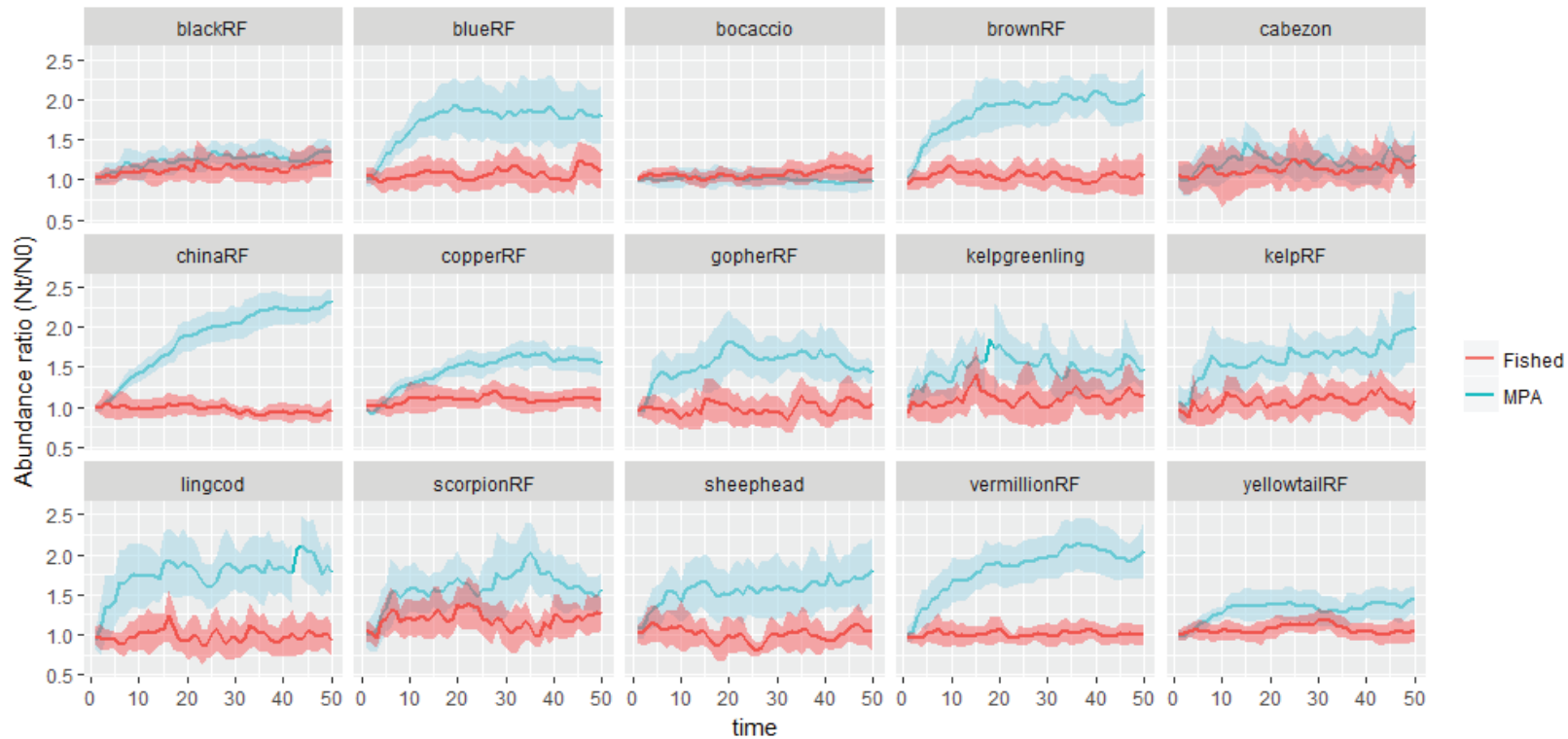


$$\left. \frac{M + F}{M} \right\}$$

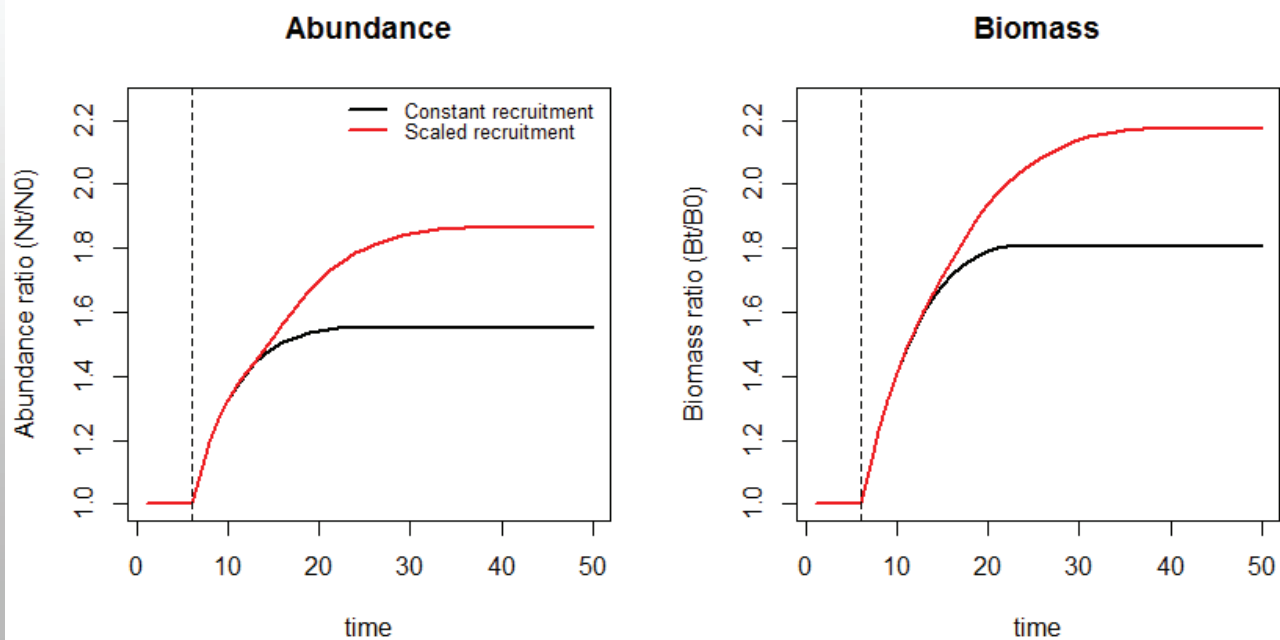
final N ratio



## MODELING STOCHASTICITY IN RECRUITMENT (preliminary result)



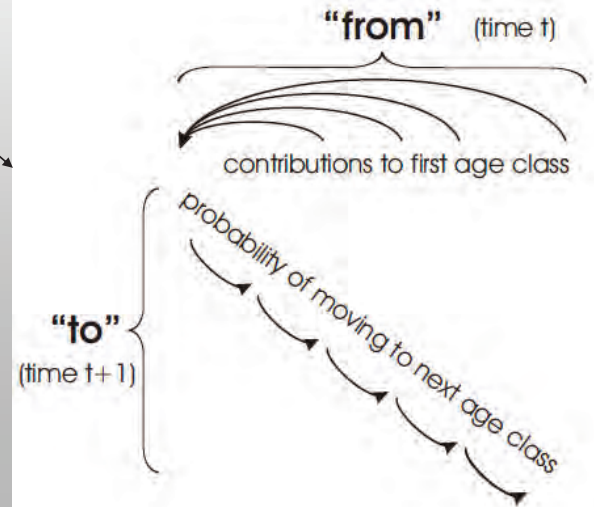
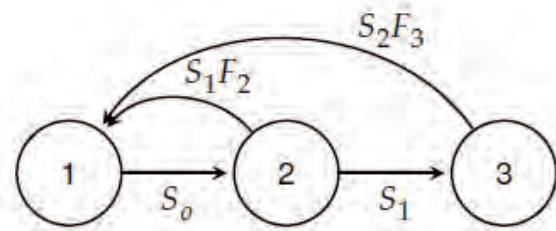
## MODELING RESPONSE RATIOS WITH CHANGES IN RECRUITMENT DUE TO MPA IMPLEMENTATION



## MODELING A CLOSED POPULATION

- CAN DETERMINE TIME SCALE OF TRANSIENT RESPONSE
- STEP 1: DETERMINE STABLE AGE DISTRIBUTION FOR FISHED POPULATION
- STEP 2: DETERMINE RATIOS OF INCREASE ONCE FISHING MORTALITY IS REMOVED

$$\mathbf{N}_{t+1} = \mathbf{A}\mathbf{N}_t,$$



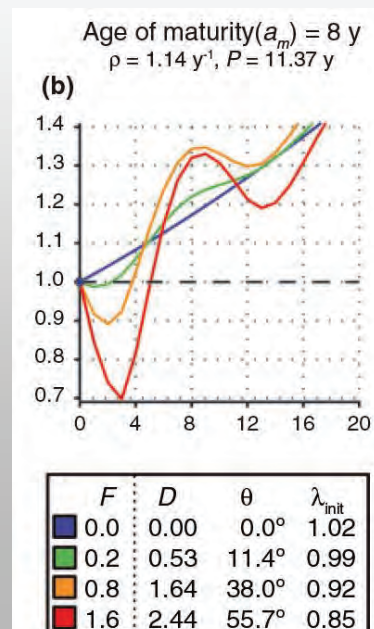
## DETERMINING TRANSIENT RESPONSES FOR A CLOSED POPULATION

- THE TRANSIENT RESPONSE OF THE CLOSED POPULATION IS A SINE WAVE OF THE PERIOD (P), THAT DIES OUT AS DAMPING RATIO (RHO)

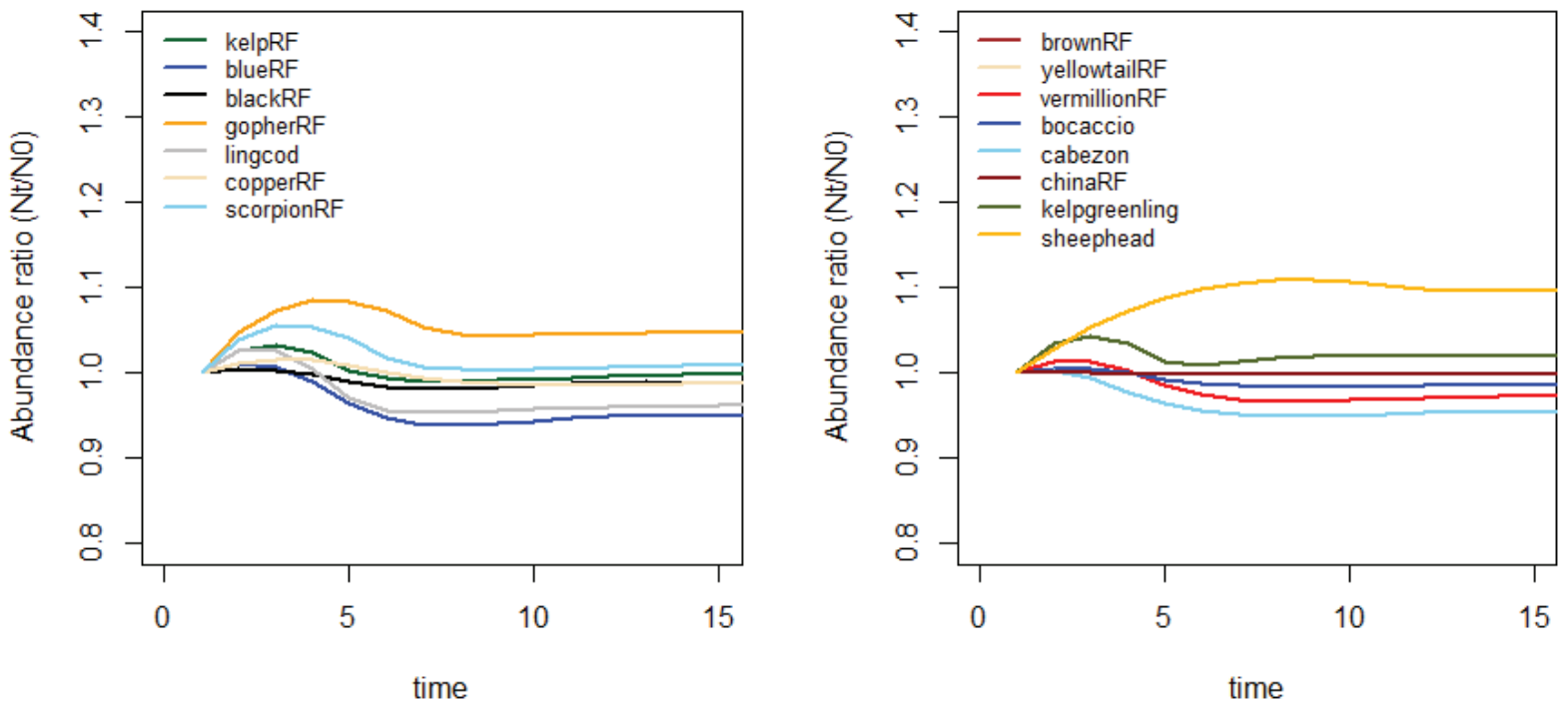
$$\rho \approx \lambda_1 / |\lambda_2|$$

$$P = 2\pi / \arctan \left( \frac{\text{Im}(\lambda_2)}{\text{Re}(\lambda_2)} \right)$$

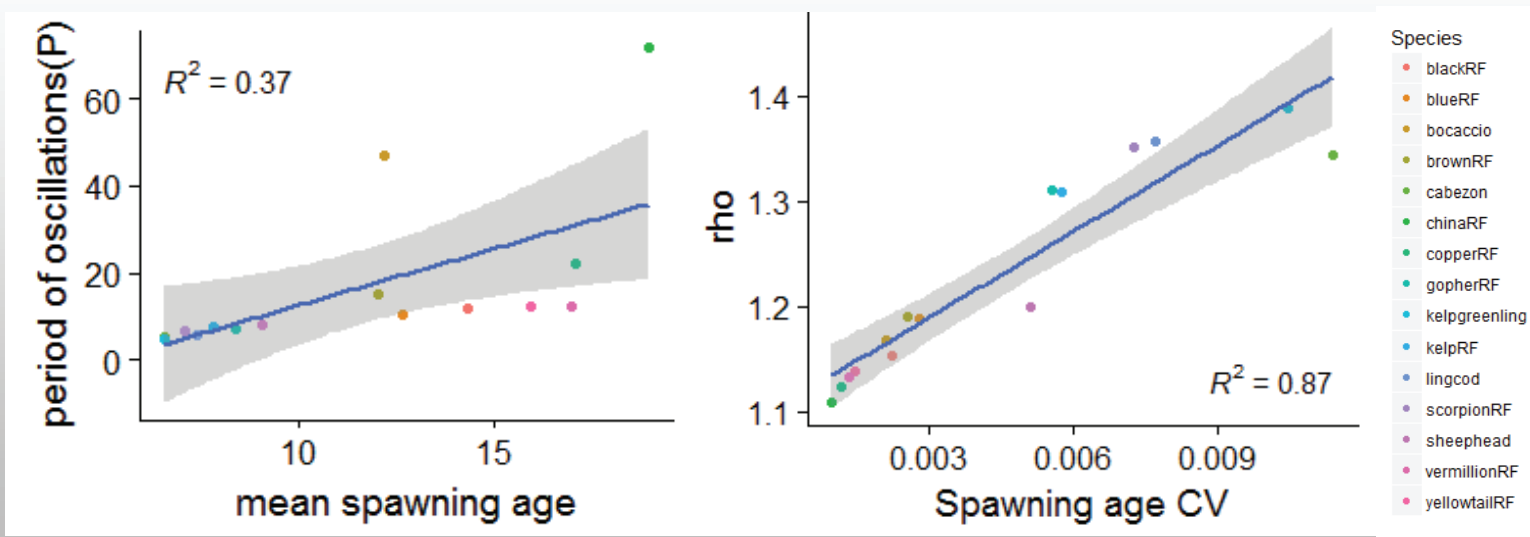
White et al. 2013



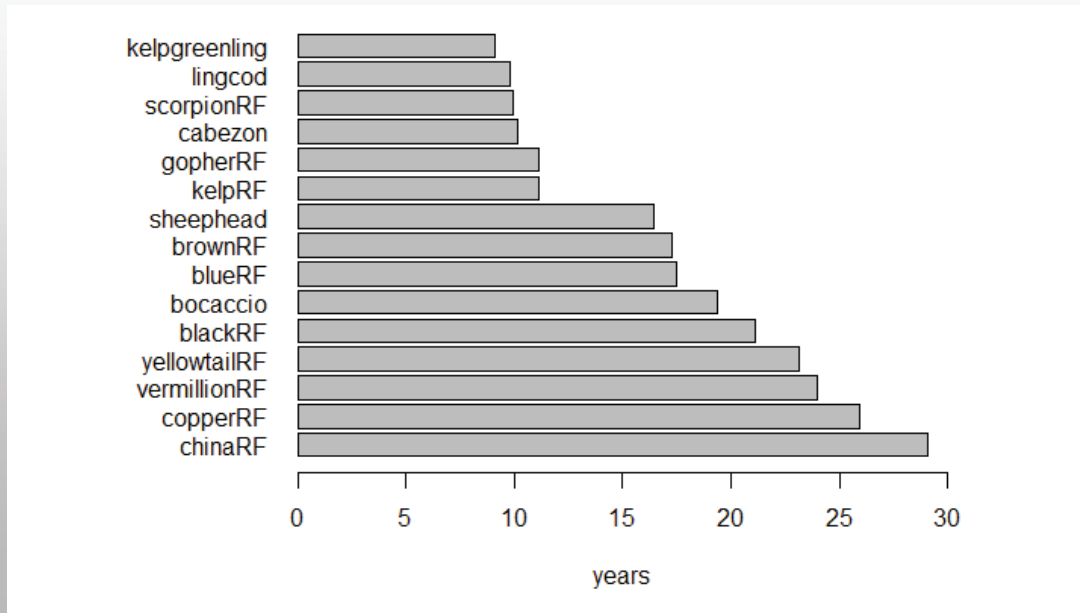
## CLOSED POPULATIONS HAVE OSCILLATORY TRANSIENT DYNAMICS



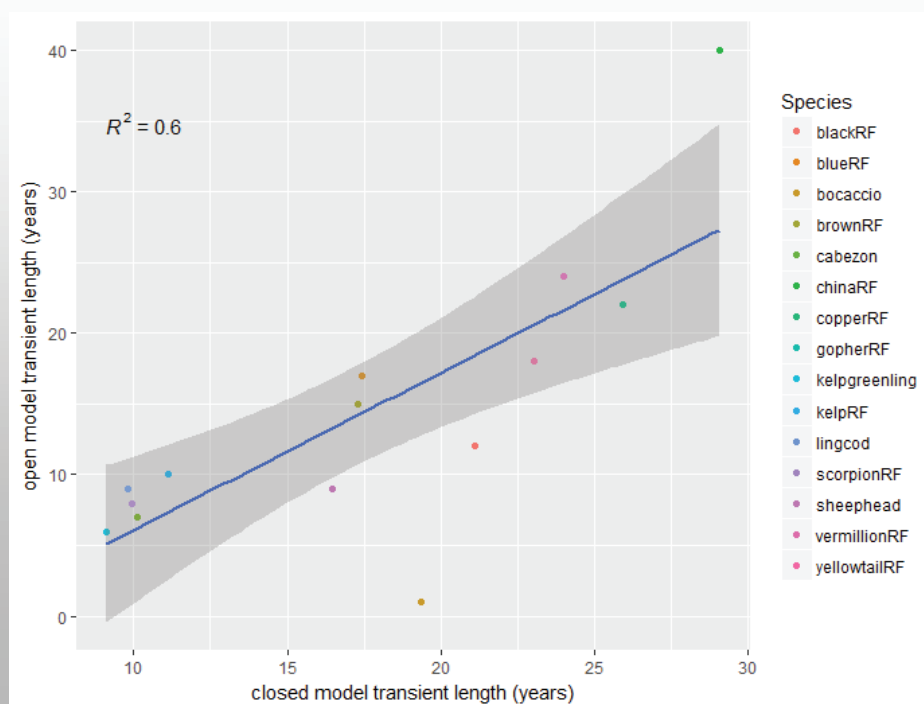
## GENERAL TRENDS OF TRANSIENT RESPONSE METRICS BASED ON LIFE HISTORIES



# LENGTH OF TRANSIENCE IN CLOSED POPULATION CASE



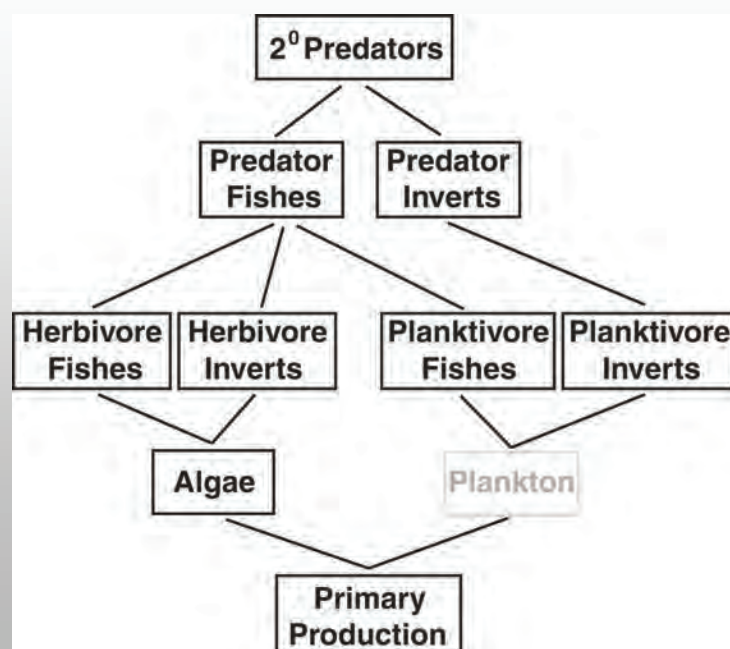
## OPEN POPULATION V. CLOSED POPULATION LENGTH OF TRANSIENT PERIODS



## PART II: ECOSYSTEM STRUCTURE, FUNCTION AND INTEGRITY GOAL

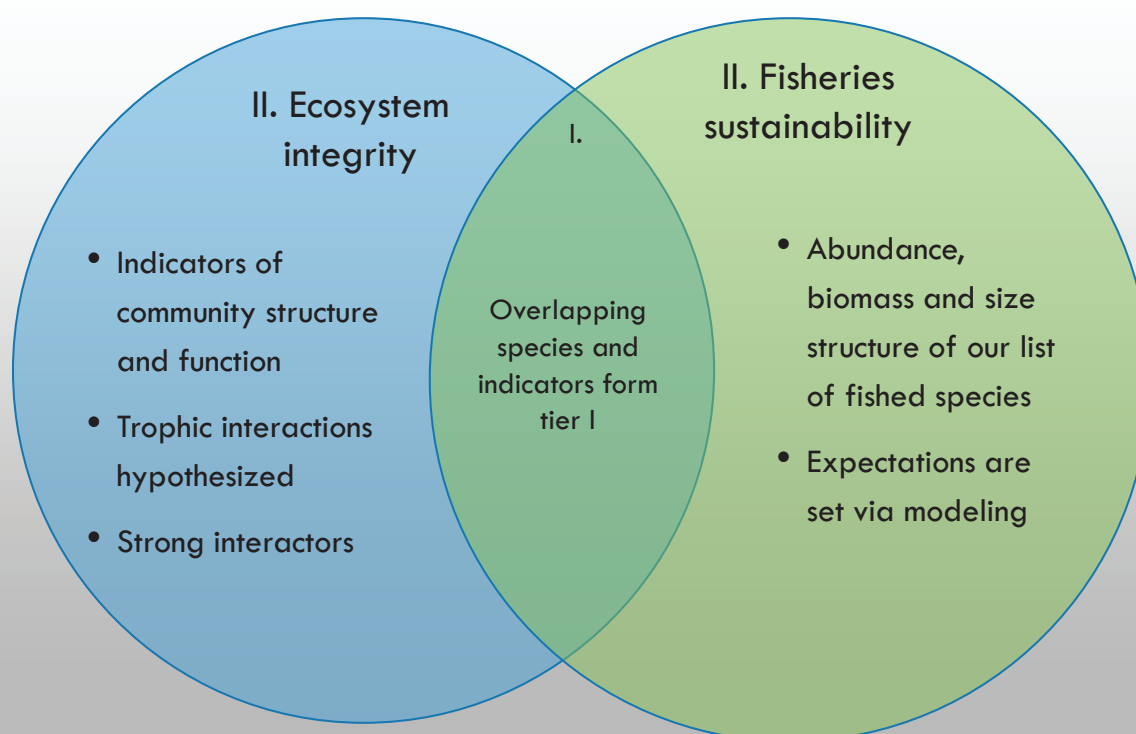
### INDICATORS BASED ON:

- I. DIRECT EFFECTS: TARGETED SPECIES THAT ALSO PLAY A STRONG ROLE IN ECOSYSTEM STRUCTURE/FUNCTION
- II. INDIRECT EFFECTS: SPECIES IMPACTED BY FISHED SPECIES (I.E. FOOD WEB DYNAMICS)
- III. INDICATORS OF COMMUNITY STRUCTURE THAT ARE NOT AFFECTED BY FISHED SPECIES (I.E. HABITAT FORMING SPECIES)
- IV. BROAD-SCALE METRICS FROM THE LITERATURE (BIODIVERSITY INDICATORS)



Halpern et al. 2006

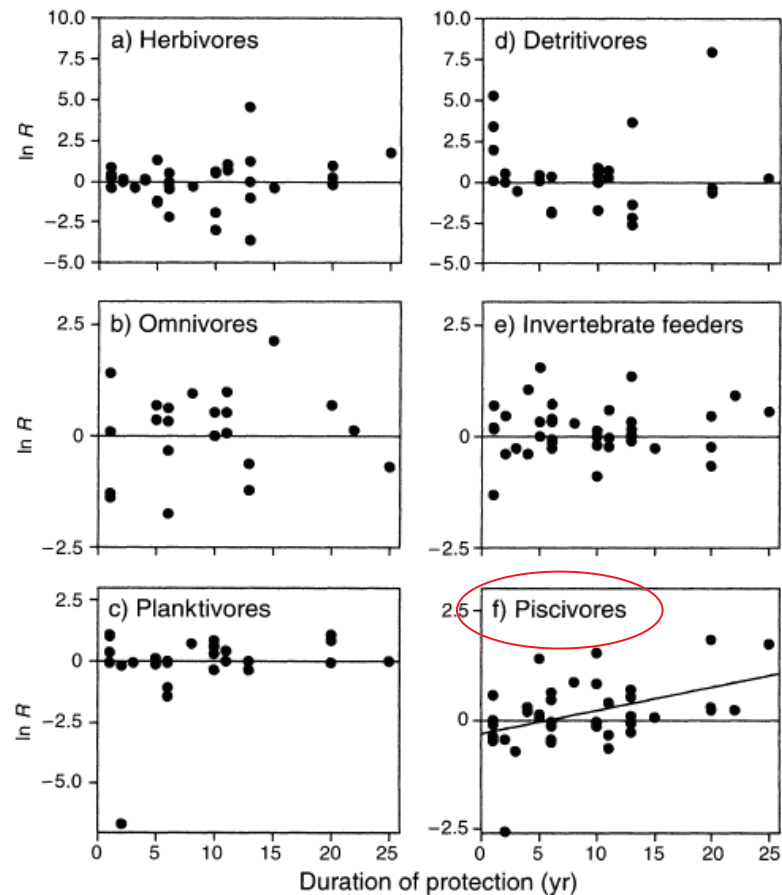
## CREATING A TIERED APPROACH



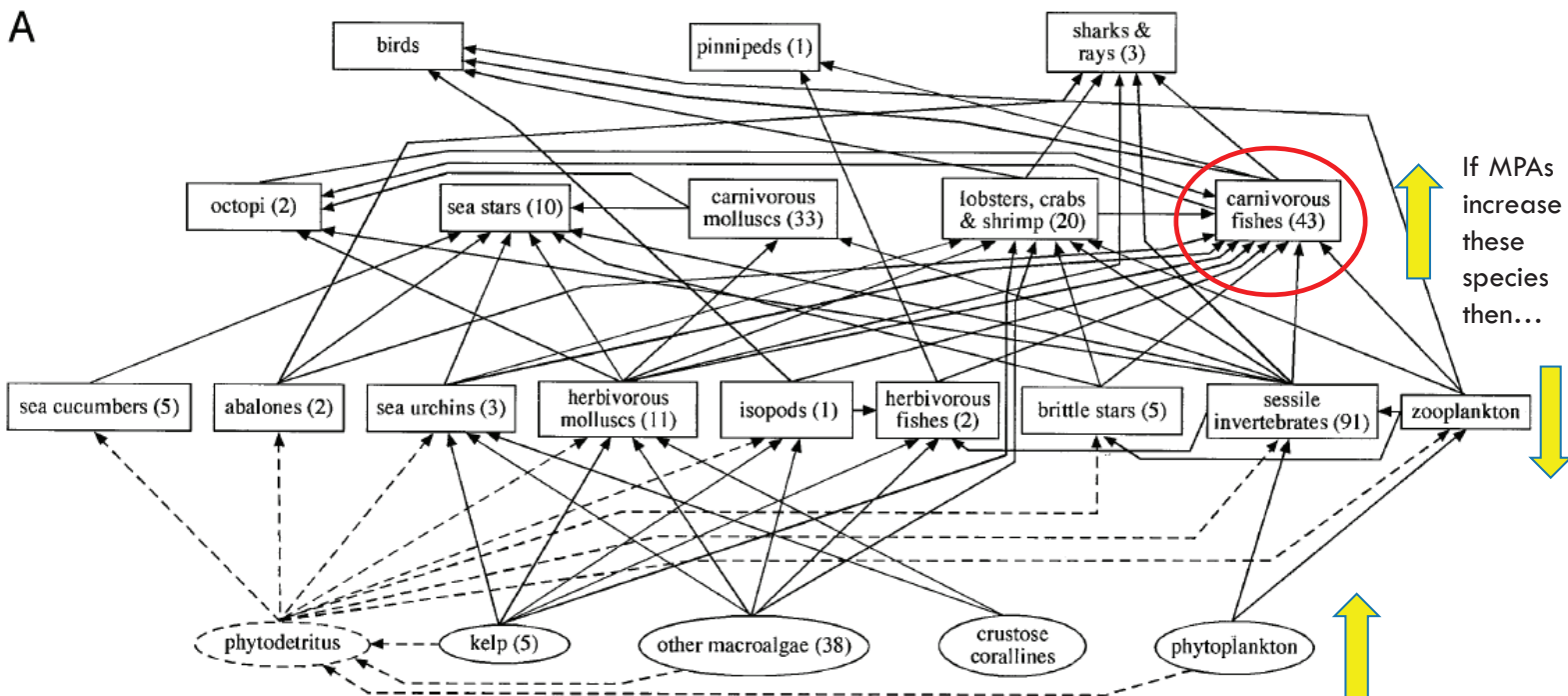
## II. INDIRECT EFFECTS: TROPHIC LEVELS SHOW DIFFERENT RESPONSES TO MARINE RESERVES

- INCREASING POSITIVE EFFECTS FOR HIGHER TROPHIC LEVELS
- MARINE RESERVES EFFECTIVE IN INCREASING **ABUNDANCES** OF EXPLOITED SPECIES AND RESTORING COMMUNITY STRUCTURE, THOUGH CHANGES OCCUR THROUGH A SERIES OF TRANSIENT STATES OVER LONG TIME FRAMES

Micheli, F; Halpern, BS; Botsford, LW; and Warner, RR. 2004



## II. INDIRECT EFFECTS: DYNAMICS OF A KELP FOREST ECOSYSTEM





Babcock et al. 2010:

Average indirect effect is 13 years or longer

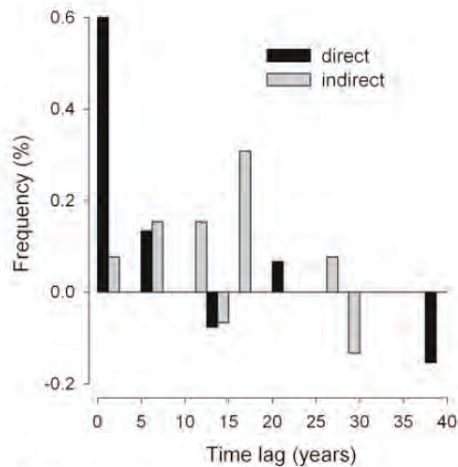
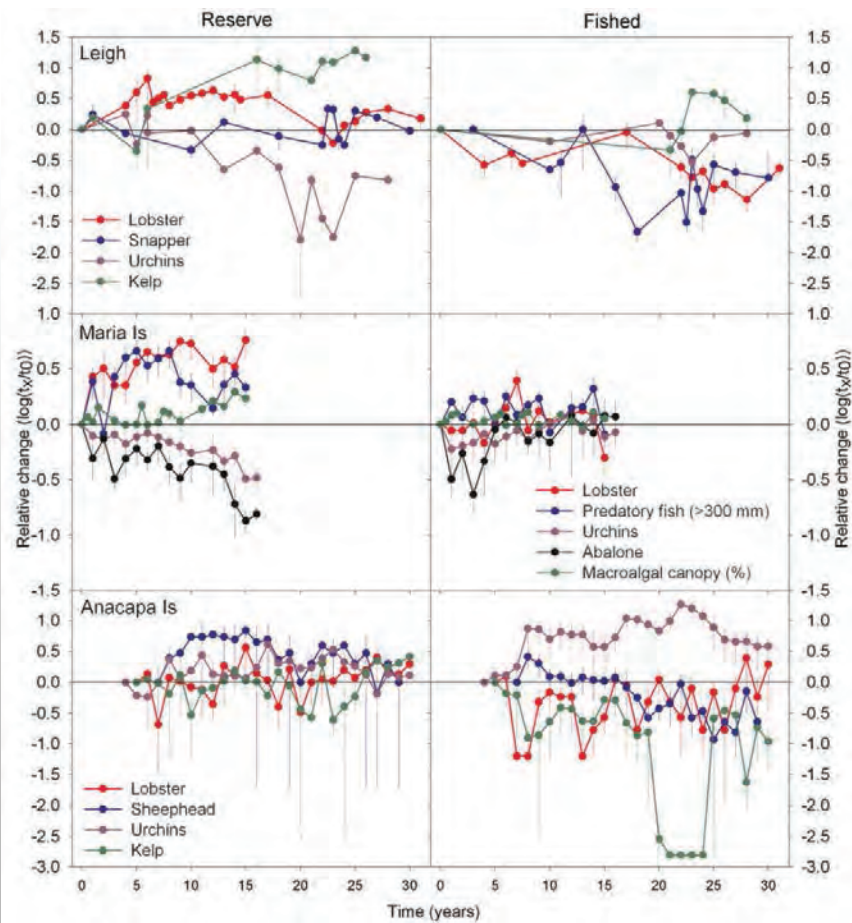


Fig. 3. Time to first detection of direct and indirect responses to marine reserve protection. Positive data indicate the proportion of observed species displaying direct and indirect effects, negative values indicate taxa for which no effect was observed.  $n = 28$ .



### III. INDICATORS OF COMMUNITY STRUCTURE

- APPROACHES
  - DETERMINE SUBSET OF COMMUNITY INDICATORS THAT CORRELATE TO FULL COMMUNITY
  - COMPARE TO REGIONAL MONITORING PLANS INDICATOR/FOCAL SPECIES LIST



# APPROACH

Raw data - >300 species

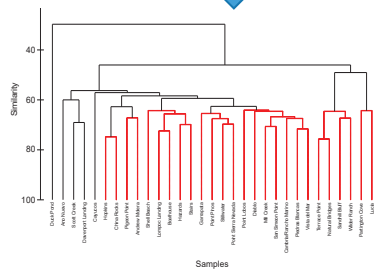
	anthopleura	bossiella spp	chthamalus s.c
Pigeon Point	4.4151E-2	6.7442E-2	0.12998
Ano Nuevo	0.10622	3.7556E-2	9.1993E-2
Scott Creek	8.0553E-2	0.12305	0.13154
Davenport Landing	0.10003	8.1677E-2	8.9473E-2
Sandhill Bluff	7.5512E-2	2.6698E-2	0.17302
Wilder Ranch	2.8296E-2	6.3271E-2	0.12005
Terrace Point	3.8028E-2	2.689E-2	0.27024

Start with all species

Similarity matrix

	Pigeon Point	Ano Nuevo	Scott Creek	Davenport L
Pigeon Point				
Ano Nuevo	58.102			
Scott Creek	55.827	57.16		
Davenport Landing	53.051	62.838	69.044	
Sandhill Bluff	35.721	42.813	50.279	53.62

Calculate similarity/dissimilarity for all pairs of sites



Link sites to assess relationships in space or time

# APPROACH

Raw data - >300 species

	anthopleura	bossiella spp	chthamalus s.c
Pigeon Point	4.4151E-2	6.7442E-2	0.12998
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Terrace Point	3.8028E-2	2.689E-2	0.27024

Create random subsets of species  
(e.g. sets of 100, 99, 98, ..., 3, 2, 1 species)

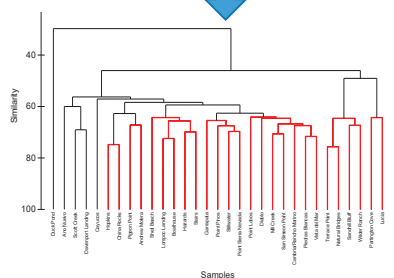
Similarity matrices (millions of combinations)

	Pigeon Point	Ano Nuevo	Scott Creek	Davenport L
Pigeon Point				
Ano Nuevo	58.102			
Scott Creek	55.827	57.16		
Davenport Landing	53.051	62.838	69.044	
Sandhill Bluff	35.721	42.813	50.279	53.62

Similarity matrix

	Pigeon Point	Ano Nuevo	Scott Creek	Davenport L
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Davenport Landing	53.051	62.838	69.044	
Sandhill Bluff	35.721	42.813	50.279	53.62

Compare fit of original matrix (all species) to new (reduced # species) matrices

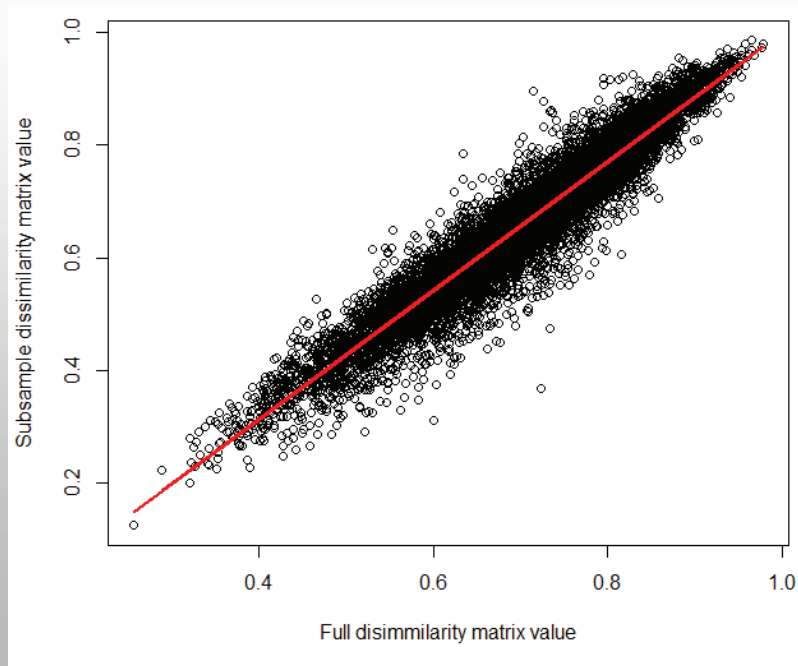


	Pigeon Point	Ano Nuevo	Scott Creek	Davenport L
Pigeon Point				
Ano Nuevo	58.102			
Scott Creek	55.827	57.16		
Davenport Landing	53.051	62.838	69.044	
Sandhill Bluff	35.721	42.813	50.279	53.62

VS

	Pigeon Point	Ano Nuevo	Scott Creek	Davenport L
Pigeon Point				
Ano Nuevo	58.102			
Scott Creek	55.827	57.16		
Davenport Landing	53.051	62.838	69.044	
Sandhill Bluff	35.721	42.813	50.279	53.62

## COMPARE REDUCED MODEL TO FULL MODEL



Bray-Curtis  
dissimilarity matrix  
for all site pairs

## III. KELP FOREST COMMUNITY INDICATORS

### Species with 95% correlation to full list

*Chromis punctipinnis*  
*Oxyjulis californica*  
*Sebastes mystinus*  
*Sebastes melanops*  
*Sebastes atrovirens*  
*Sebastes carnatus*  
*Sebastes chrysomelas*  
*Sebastes nebulosus*  
*Sebastes serranoides*  
*Embiotoca jacksoni*  
*Embiotoca lateralis*



blacksmith



black rockfish



Black and yellow rockfish



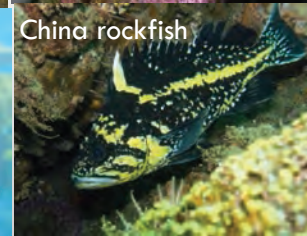
Striped surfperch



Señorita



kelp rockfish



China rockfish



blue rockfish



Gopher rockfish



Black surfperch



## III. Rocky intertidal sedentary species

## Species with 95% correlation to full list

*Balanus glandula*Blue green algae *callothrix**Chondracanthus canaliculatus**Chthamalus dalli/fissus**Corallina* spp*Egregia menziesii**Endocladia muricata**Fucus* spp*Gelidium coulteri**Mastocarpus* spp*Mazzaella cordata* / *Mazzaella splendens**Odonthalia floccosa**Petrocelis**Phragmatopoma sabellaria* spp*Phyllospadix scouleri**Phyllospadix torreyi**Silvetia compressa**Tetraclita rubescens**Ulva*.spp/*Enteromorpha*.spp/*Monostroma*.spp

## III. MOBILE INTERTIDAL SPECIES

## Species with 95% correlation to full list

Periwinkle (*Littorina keenae*)Checkered periwinkle (*Littorina plena scutulata*)*Littorina* spp*Lottia austrodigitalis digitalis*

Small limpet

*Pisaster ochraceus*

## II. COMPARISON: KELP FOREST INDICATORS SELECTED IN REGIONAL MONITORING PLANS

Central coast example

### ECOSYSTEM FEATURE ASSESSMENT

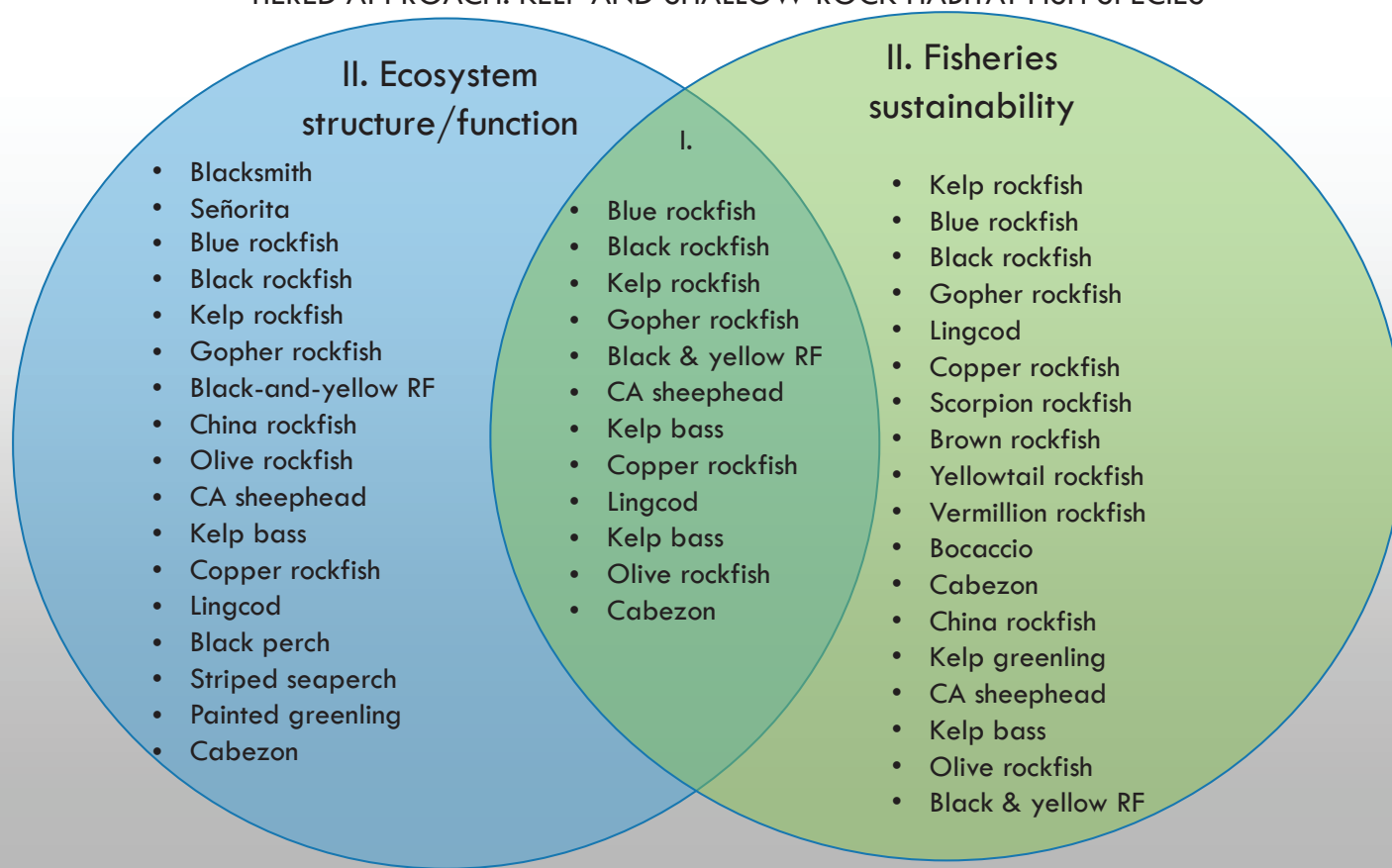
Key Attribute	Indicator/Focal Species
Biogenic Habitat: Macroalgal assemblage	Areal extent of surface kelp canopy (e.g., <i>Macrocystis pyrifera</i> , <i>Nereocystis luetkeana</i> ) Number of kelp stipes: ➤ Bull kelp ( <i>Nereocystis luetkeana</i> ) ➤ Giant kelp ( <i>Macrocystis pyrifera</i> ), stipes per plant
Trophic Structure: Omnivorous Invertebrates	Density & size structure of focal species: ➤ Black abalone ( <i>Haliotis cracherodii</i> ) ➤ Purple sea urchin ( <i>Strongylocentrotus purpuratus</i> ) ➤ Red abalone ( <i>Haliotis rufescens</i> ) ➤ Red sea urchin ( <i>Strongylocentrotus franciscanus</i> )
Trophic Structure: Detritivorous Invertebrates	Density & size structure of sea stars (e.g., <i>Patiria miniata</i> )
Trophic Structure: Predatory Invertebrates	Density & size structure of sea stars (e.g., <i>Pisaster</i> spp., <i>Pycnopodia helianthoides</i> )
Trophic Structure: Planktivorous fishes	Density & size structure <sup>1</sup> of blue rockfish ( <i>Sebastes mystinus</i> )
Trophic Structure: Omnivorous fishes	Density & size structure <sup>1</sup> of focal species: ➤ Black & yellow rockfish ( <i>Sebastes chrysomelas</i> ) ➤ Cabezon ( <i>Scorpaenichthys marmoratus</i> ) ➤ Gopher rockfish ( <i>Sebastes carnatus</i> ) ➤ Kelp rockfish ( <i>Sebastes atrovirens</i> ) ➤ Painted greenling ( <i>Oxylebius pictus</i> ) ➤ Striped seaperch (e.g., <i>Embiotica lateralis</i> ) ➤ Black perch (e.g., <i>Embiotica jacksoni</i> )
Trophic Structure: Piscivorous fishes	Density & size structure <sup>1</sup> of focal species: ➤ Black rockfish ( <i>Sebastes melanops</i> )

Indicators from subsample matrices	South coast regional list	Central coast regional list	North coast regional list
blacksmith ( <i>Chromis punctipinnis</i> )	Giant kelp ( <i>Macrocystis pyrifera</i> )	Bull kelp ( <i>Nereocystis luetkeana</i> )	Stalked kelp ( <i>Pterygophora californica</i> )
Señorita ( <i>Oxyjulis californica</i> )	Red sea urchin ( <i>Strongylocentrotus franciscanus</i> )	Sea stars ( <i>Patiria miniata</i> )	California sea cucumber ( <i>Parastichopus californicus</i> )
Blue rockfish ( <i>Sebastes mystinus</i> )	Purple sea urchin ( <i>Strongylocentrotus purpuratus</i> )	Painted greenling ( <i>Oxylebius pictus</i> )	
Black rockfish ( <i>Sebastes melanops</i> )	Spiny lobster ( <i>Panulirus interruptus</i> )	Striped seaperch ( <i>Embiotica lateralis</i> )	
Kelp rockfish ( <i>Sebastes atrovirens</i> )	California sheephead ( <i>Semicossyphus pulcher</i> )	Black perch ( <i>Embiotica jacksoni</i> )	
Gopher rockfish ( <i>Sebastes carnatus</i> )	Kelp bass ( <i>Paralabrax clathratus</i> )	Copper rockfish ( <i>Sebastes caurinus</i> )	
Black-and-yellow rockfish ( <i>Sebastes chrysomelas</i> )	Cabezon ( <i>Scorpaenichthys marmoratus</i> )	Lingcod ( <i>Ophiodon elongatus</i> )	
China rockfish ( <i>Sebastes nebulosus</i> )	Kellett's whelk ( <i>Kelletia kelletii</i> )	Sea otters ( <i>Enhydra lutris</i> )	
Olive rockfish ( <i>Sebastes serranoides</i> )	Sea stars ( <i>Pisaster</i> spp., <i>Pycnopodia helianthoides</i> )		
Black surfperch ( <i>Embiotoca jacksoni</i> )	Abalone ( <i>Haliotis</i> spp.)		
Striped surfperch ( <i>Embiotoca lateralis</i> )	Giant keyhole limpet ( <i>Megathura crenulata</i> )		
	Wavy turban snail ( <i>Megastrea undosa</i> )		

FINAL KELP  
AND SHALLOW  
ROCK  
INDICATORS  
FOR  
COMMUNITY  
STRUCTURE  
SELECTED  
FROM  
COMBINATION  
OF METHODS



## TIERED APPROACH: KELP AND SHALLOW ROCK HABITAT FISH SPECIES



## IV. BROAD-SCALE COMMUNITY LEVEL METRICS AND BIODIVERSITY INDICATORS

**Table 2. Indicators of community-level response to marine protected area establishment recommended for use by managers.**

<i>Category</i>	<i>metric (s)</i>
Biomass	total biomass
Abundance	total abundance & log normal $\mu$
Dominance	McNaughton & relative dominance
Evenness	eCDF slope
Rarity	log skew
Richness	log series $\alpha$
Diversity	Shannon & Simpson diversity

Soykan et al. 2015

## HOW TO FOCUS ASSESSMENT OF ECOSYSTEM CONDITION?

- HIRE FIELD STAFF THAT ARE EXPERTS IN SPECIES IDENTIFICATION WHO CAN MONITOR EVERYTHING AT KEY SITES?
  - METRICS FOR EVENNESS, RICHNESS, RARITY ETC. WILL REQUIRE INTENSIVE MONITORING EFFORT
- FOCAL SPECIES LISTS CAN BE USED TO GUIDE CITIZEN SCIENCE PROGRAMS AND/OR ANALYSIS OF KEY SPECIES OF INTEREST?
  - FULL LIST OR SUBSET OF INDICATOR SPECIES?

## DISCUSSION QUESTIONS

- SHOULD WE MONITOR COMMUNITY INDICATORS SUCH AS HABITAT-FORMING SPECIES THAT ARE NOT DIRECTLY IMPACTED BY MPAS?
  - IS IT AN OBJECTIVE OF THE MPA MONITORING PROGRAM TO EVALUATE BROADER ECOLOGICAL PATTERNS AND CHANGE INDEPENDENT OF MPA EFFECTS?

## REFERENCES

- BABCOCK RC, SHEARS NT, ALCALA AC, BARRETT NS, EDGAR GJ, LAFFERTY KD, MCCLANAHAN TR, RUSS GR. 2010. DECADAL TRENDS IN MARINE RESERVES REVEAL DIFFERENTIAL RATES OF CHANGE IN DIRECT AND INDIRECT EFFECTS. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES **107**:18256–18261.
- HALPERN BS, COTTENIE K, BROITMAN BR (2006) STRONG TOP-DOWN CONTROL IN SOUTHERN CALIFORNIA KELP FOREST ECOSYSTEMS. SCIENCE 312:1230–1232 . DOI: 10.1126/SCIENCE.1128613
- MICHELI F, HALPERN BS, BOTSFORD LW, WARNER RR. 2004. TRAJECTORIES AND CORRELATES OF COMMUNITY CHANGE IN NO-TAKE MARINE RESERVES. ECOLOGICAL APPLICATIONS **14**:1709–1723.
- SOYKAN CU, LEWISON RL (2015) USING COMMUNITY-LEVEL METRICS TO MONITOR THE EFFECTS OF MARINE PROTECTED AREAS ON BIODIVERSITY. CONSERVATION BIOLOGY 29:775–783 . DOI: 10.1111/COBI.12445
- WHITE JW, BOTSFORD LW, HASTINGS A, ET AL (2013) TRANSIENT RESPONSES OF FISHED POPULATIONS TO MARINE RESERVE ESTABLISHMENT. CONSERVATION LETTERS 6:180–191 . DOI: 10.1111/J.1755-263X.2012.00295.X

### (Appendix D)

## Estimating Local Values of F: Needed for both Fisheries (MLMA) and MPAs (MLPA)

Lauren Yamane





# Local fishing mortality provides a way to integrate MLMA and MLPA for adaptive management

Fishing mortality (F) = instantaneous rate of mortality due to fishing

- Has a direct effect on population dynamics! Which means you can set expectations of population response

MLMA : Stock assessments often include only broad, regional estimates of fishing mortality (F)

- Spatial heterogeneity in F can influence yield (Ralston and O'Farrell 2008)
- Lobster FMP identifies F as an EFI of the highest priority:  
*"F directly links to the MLMA objectives (Table 5-1), to reference points determined or used by the FMP models, and to any control rule described by the FMP."*

MLPA : Expect greater biomass increases for MPAs/species with high historical F

## Tiered methods to determine fishing pressure

**Data-rich:** Estimating pre-MPA local F with SSM

- Fit PIS OR eef Chec size data to ode l
- First step: e n does the odel produce reliable estimates of F
- Estimated local F's (entral as t future focus: South as t)

**Data-moderate:** estimate fine-scale historical fishing effort with fisheries-dependent data

- Use spatially explicit FF S data (200 -present) to visualize fishing effort across state
- river ental oa ts (future focus party oa ts)

**Data-poor:** use regional proxies for historical fishing

*Use data-rich to inform data-poor?*

# Management decisions informed by fishing pressure analyses

## Data-rich: Estimating local Fishing Pressure (SSIPM)

- Biological characteristics = *Who* to monitor? **Done** **Indicator species**
- Sample size = *How many* to monitor? **In progress**
- Time series length = *How much* and *where* to monitor? **In progress** **Site selection**

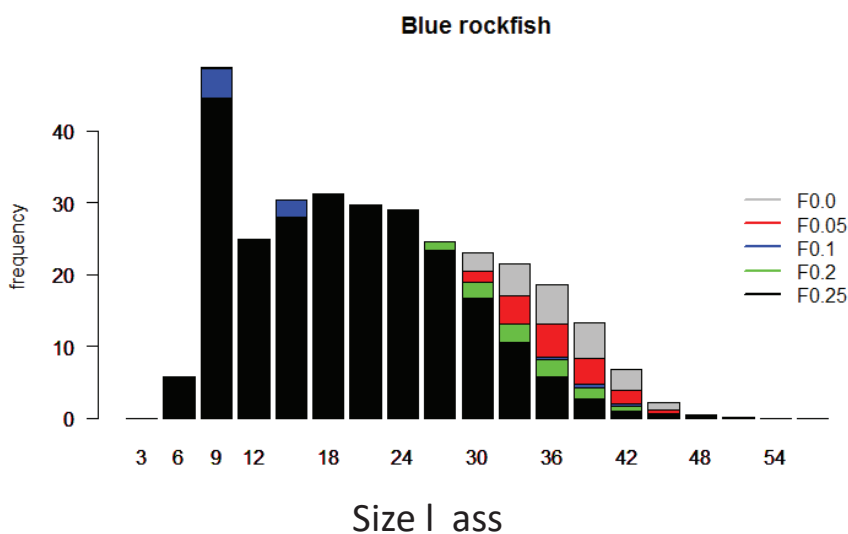
## Data-moderate: Estimate fine-scale historical fishing effort

- **Can't plug these in to Katie's estimates of fill-in rates** **Site selection**
- *Who* and *where* to monitor **Olivia O'Connell**

## Data-poor: Regional proxy of historical fishing effort

- Best guess on *where* to monitor (North as a start) **Still needed** **Site selection**

Reminder: higher F's mean greater truncation of size structure and greater ability to detect fill-in response

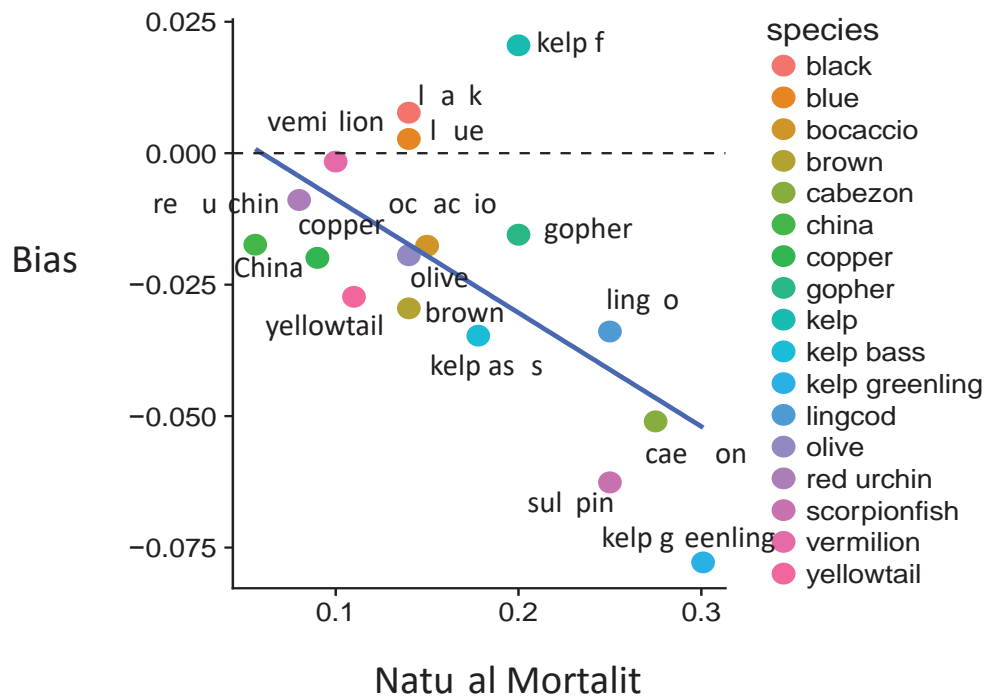


Linf	38.15
K	0.172
t	-1.145
M	0.14
aa t	27.086
Lfish	21.02
Reruit size	4
YOY	<10

Even species has different biological characteristics

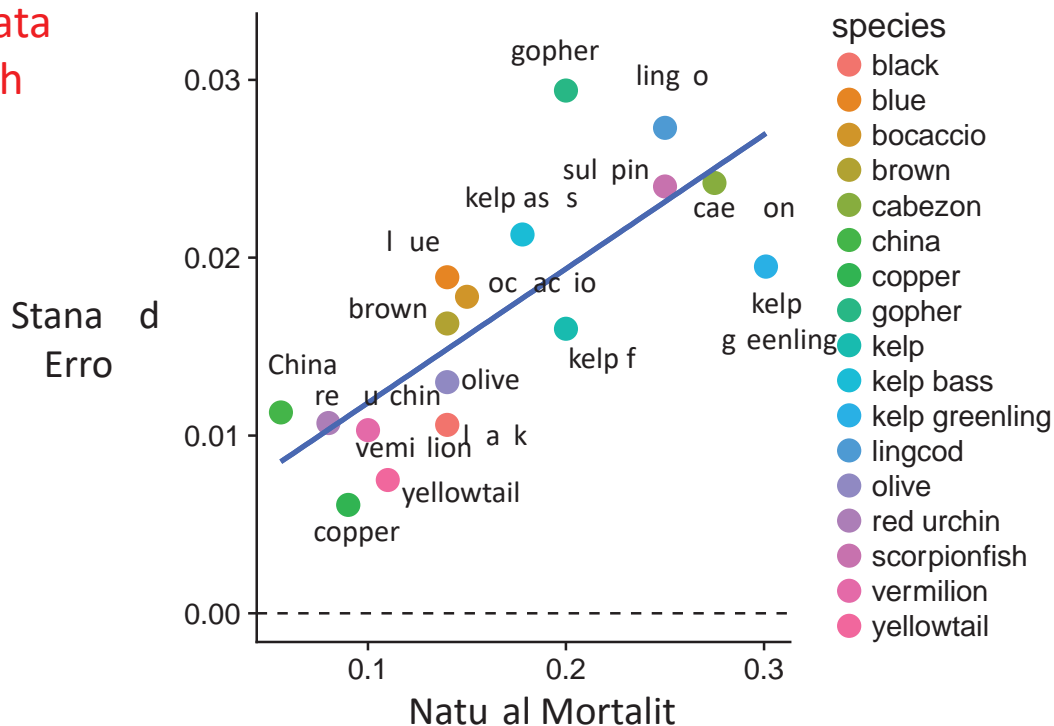
# As natural mortality increases model underestimates F

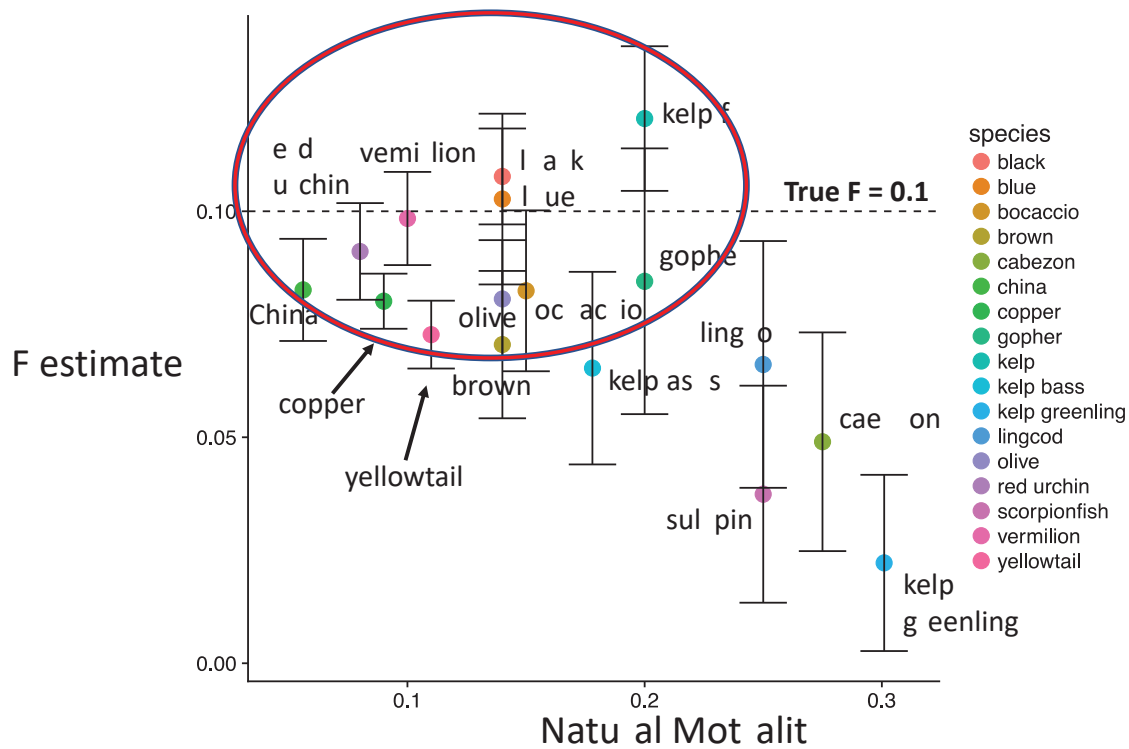
Data  
Rih



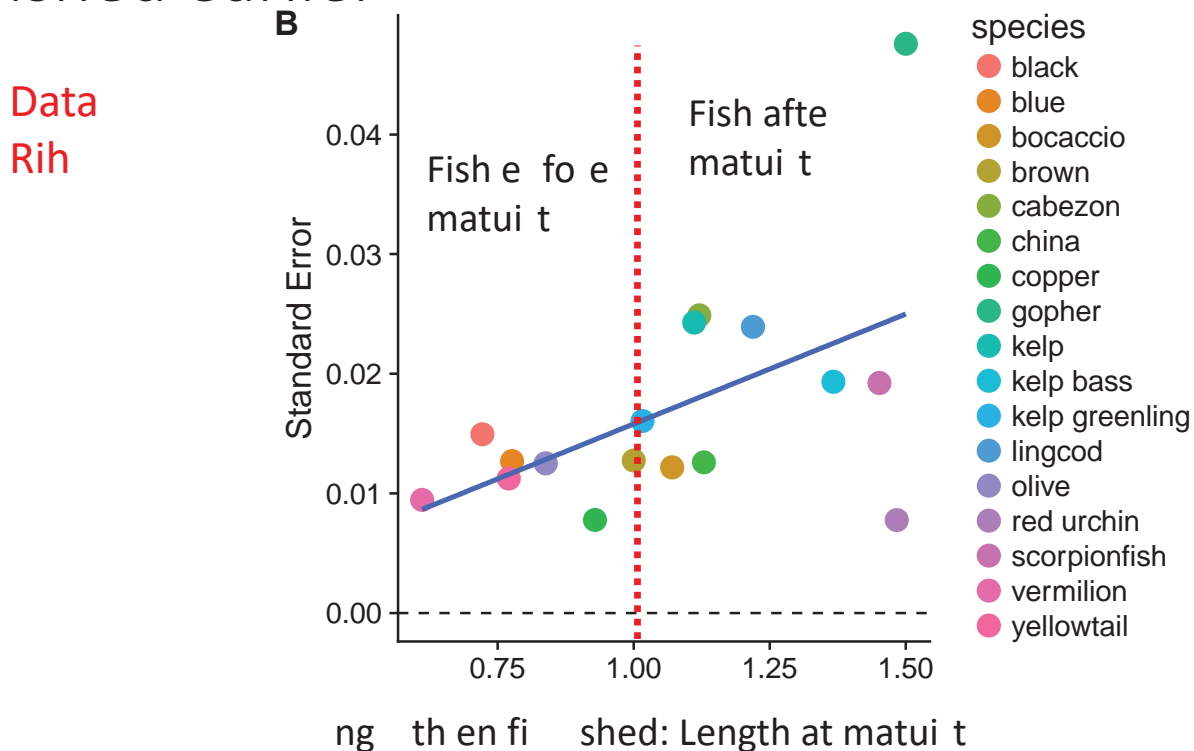
... and error increases

Data  
Rih





Precision of F estimate increases if species is fished earlier



## Overall: what species characteristics enhance estimate of the local fishing mortality?

Species with:

- Low natural mortality (M) rates
- Age at maturity exceeding the natural mortality rate (e.g.,  $k > M$ )
- Fishery in life history

Which species would enable more reliable local F estimates based on biological characteristics?

Data

Risk

### Worse choices

- CA Scorpionfish
- Lingcod
- Cynoscion
- Kelp greenling

### Better choices

- Blue rockfish
- Vermilion rockfish
- Copper rockfish
- Yellowtail rockfish
- Kelp rockfish
- Chinook salmon
- Rockfish

# Where model has been applied to data to estimate local F so far

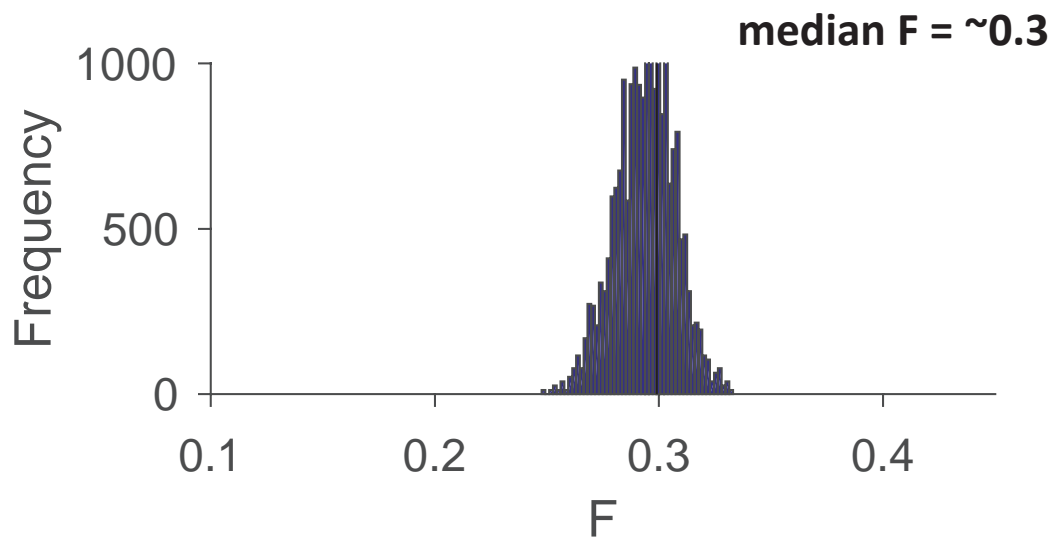
## Central Coast

- Coppe , Bla k-an -Yellow, Blue OliveY ellowtail complex at i ffe ent MP ppea e most abundant of the “better choices”)
- Blue most relial e F estimates
- OliveY ellowtail complex may e t oo complicate given i ffe ent movement patte ns of t o spei es



## Blue Rockfish at Vandenberg SMR : F estimate

Data  
Rich

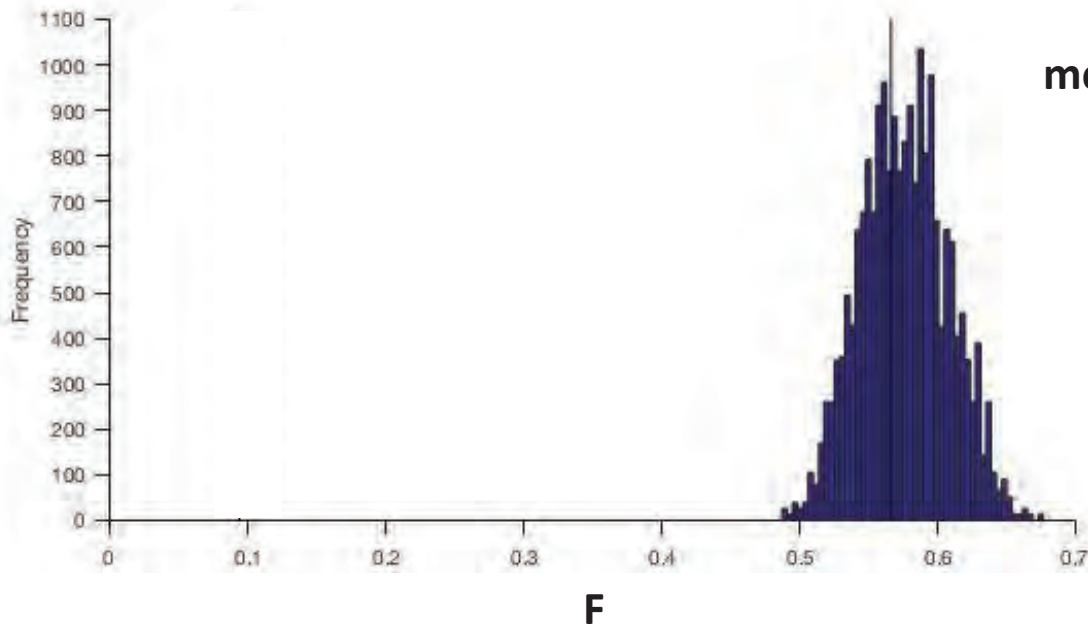


Blue rockfish seems to be a model indicator species for understanding MPA responses

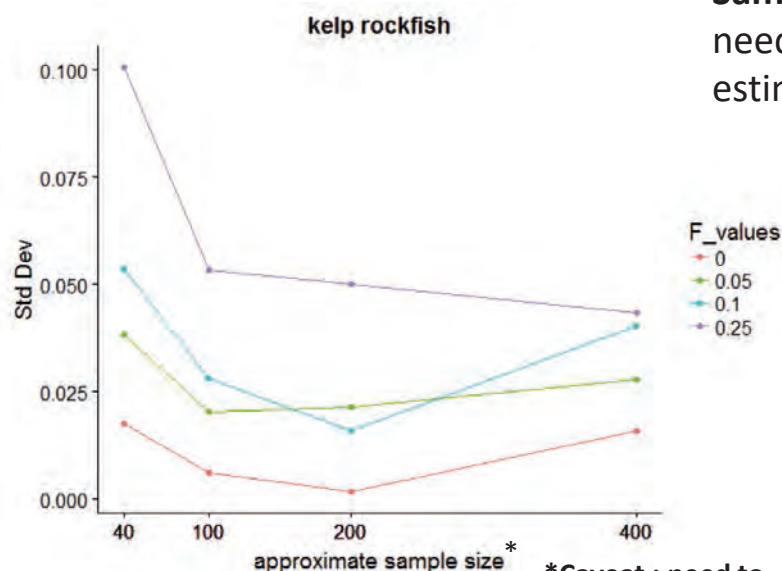
(other r octi ons of resons es for blue roci sh at other nt tra as t MPAs by Nickols et a ., in r e )

# Blue Rockfish at Natural Bridges SMR (Santa Cruz) : F estimate

Data  
Rich



Higher sample sizes lead to greater precision of F estimate



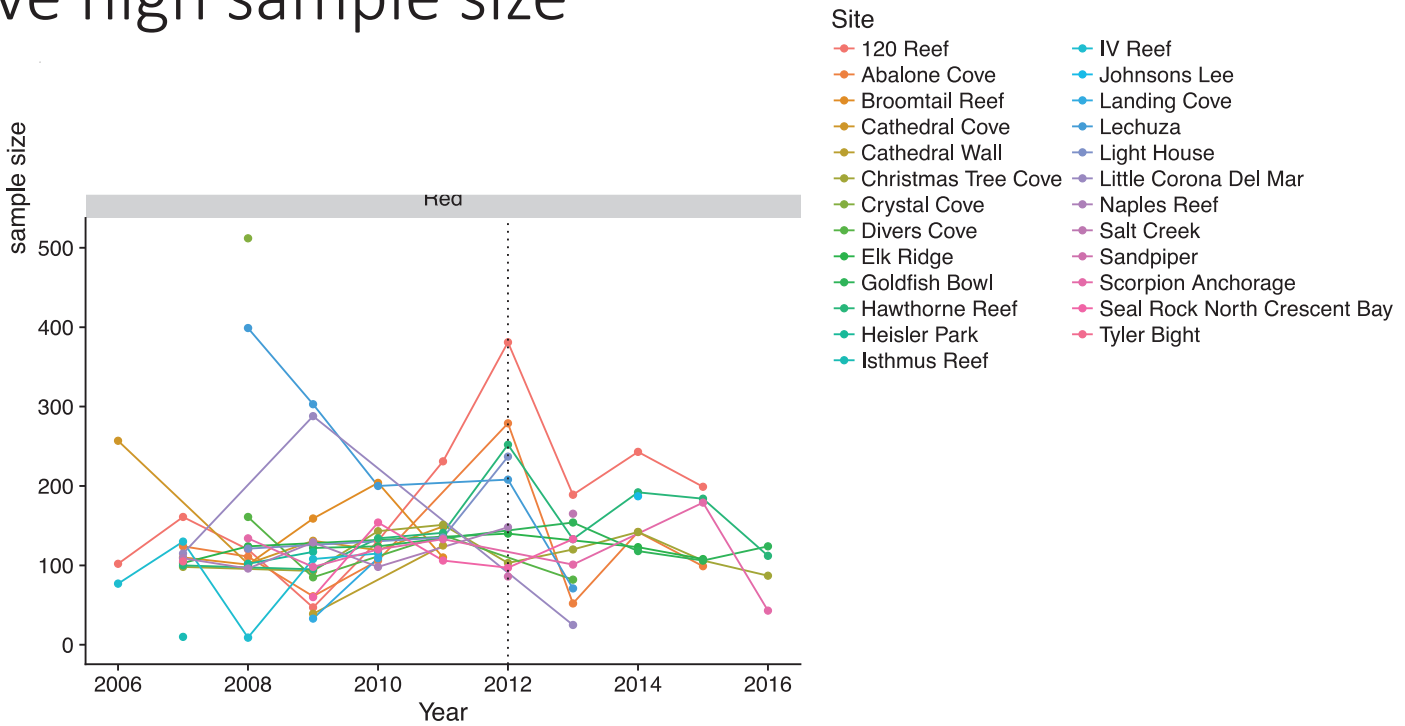
**Sample size\*:** May need 100's to estimate F

\*Caveat : need to transform this to be sample size



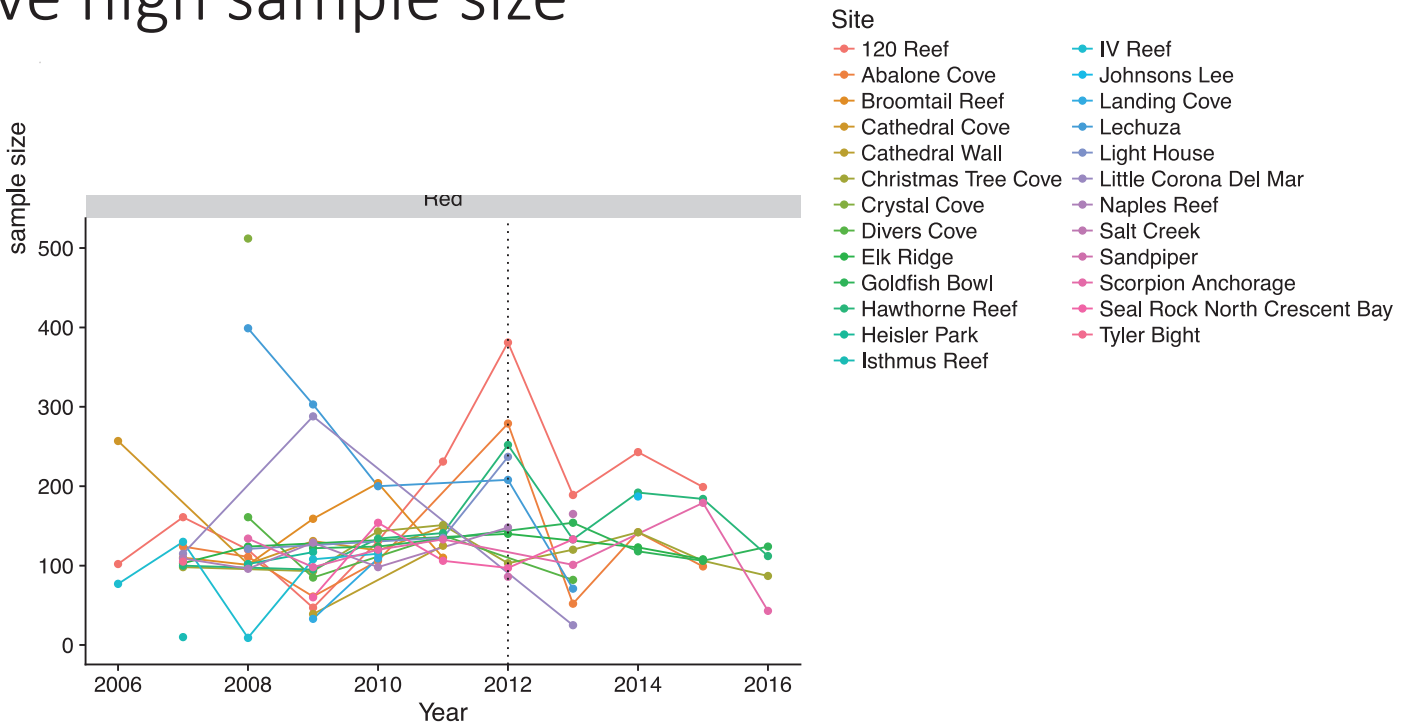
# Reef Check data: South Coast red urchins have high sample size

Dat  
Rich

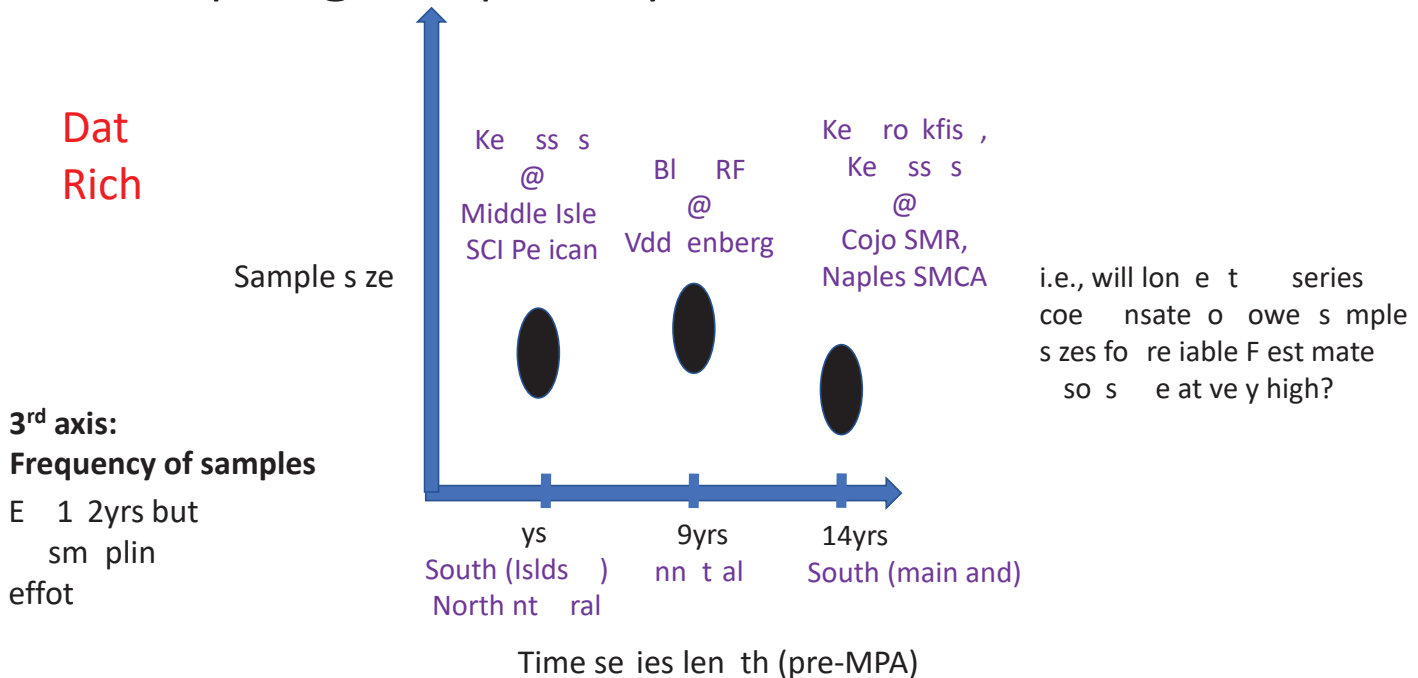


# Reef Check data: South Coast red urchins have high sample size

Dat  
Rich



# Exploring sample size, time series length, and sampling frequency can inform Action Plan



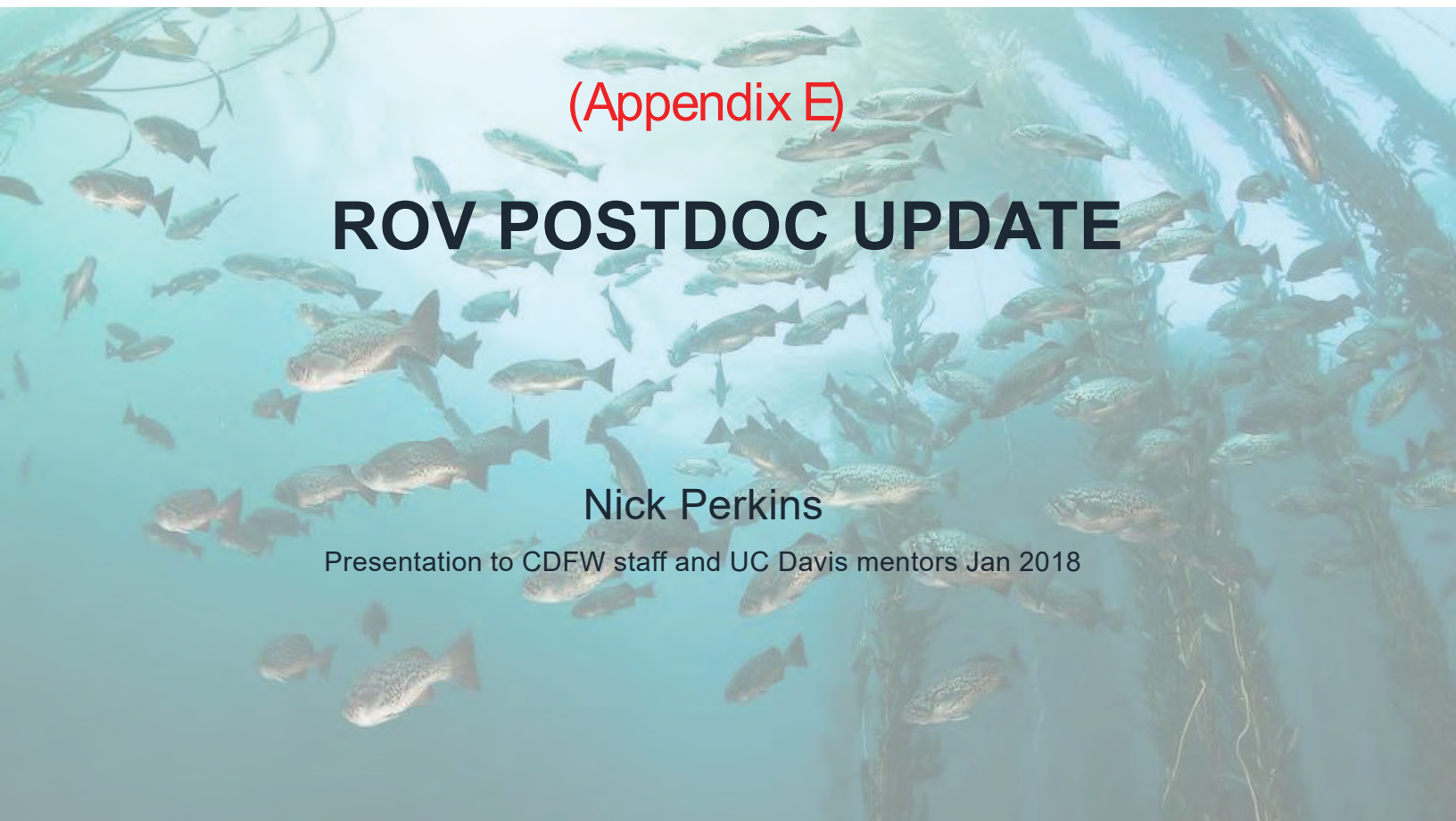
## Data moderate: Estimate fine-scale historical fishing effort

- Fishing effort may be proportion to sustainability
- Fishing effort and effort on seafloor not defined for SSIPM, e.g.:
  - Lincoln
  - Cabezon
  - CA Scorpion
  - Ke ss s

Pticularly important in the Southern region
- to estimate historical fishing effort time As
  - Olivia oess (OST/SCCWRP) assessed relative fishing effort following Paulo Serpa's approach
- to compare relative effort on otter trawl fishery for recreational party boat des
  - Standardize by number of samples (interviews)
  - This can help us see if monitoring sites with high historical fishing for each region



Thanks for listening!  
Questions or Suggestions??



(Appendix E)

## ROV POSTDOC UPDATE

Nick Perkins

Presentation to CDFW staff and UC Davis mentors Jan 2018

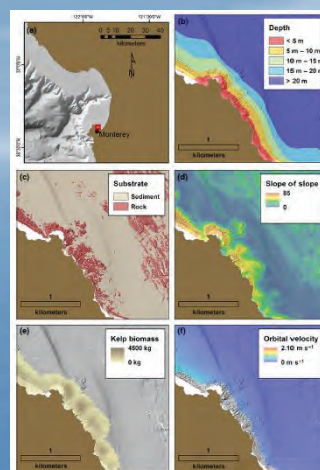


# COMPONENTS OF PROJECT

1. Methods for analyzing ROV transect data
  - Model based approaches
  - Spatial point process models
2. Survey and sampling design with a ROV
3. Eco-regionalization using ROV and SCUBA data

## 1. METHODS FOR ANALYZING ROV TRANSECT DATA

- Model-based approaches:
  - Able to incorporate habitat and bathymetry covariates
  - Improved estimates across areas



**Table 3** Comparison of species abundance estimates generated by three methods for extrapolating species density within the Point Sur MPA: uniform extrapolation treating all rocks as equal, non-spatial habitat-based extrapolation and the abundances predicted from the spatially explicit species distribution models

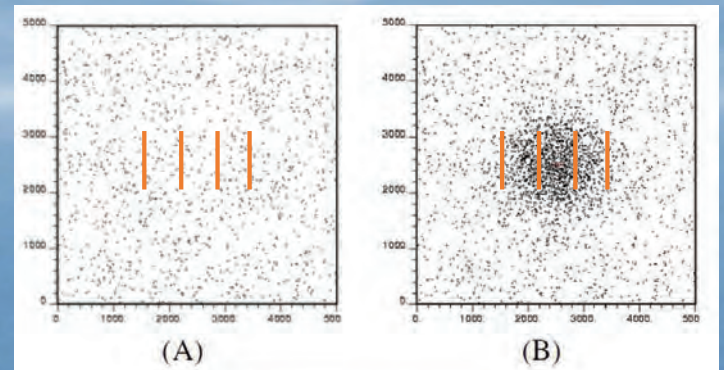
Species	Common name	Uniform extrapolated abundance	Geomorphic-based extrapolated abundance	SDM-based extrapolated abundance
<i>Embiotoca jacksoni</i>	Black Perch	91,49	2,897	48,90
<i>Embiotoca lateralis</i>	Striped Perch	59,065	23,014	22,655
<i>Sebastes serranoides</i>	Olive Rockfish	157,071	46,466	19,895
<i>Sebastes atrovirens</i>	Kelp Rockfish	38,133	13,313	91,98
<i>Sebastes carnatus</i>	Gopher Rockfish	69,650	19,072	14,621
<i>Sebastes chrysomelas</i>	Black & Yellow Rockfish	20,977	11,315	10,817
<i>Sebastes melanops</i>	Black Rockfish	161,165	12,844	8,666

Figure and table from Young and Carr (2015)



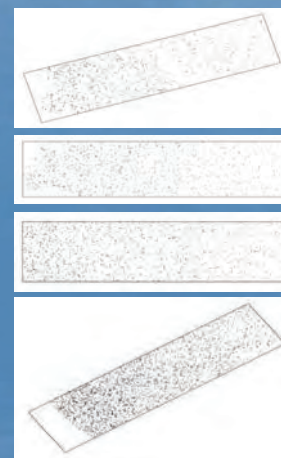
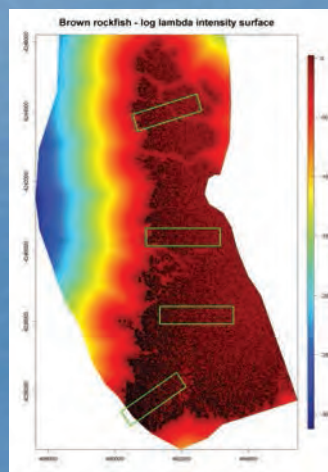
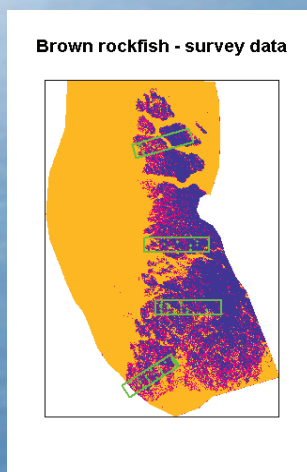
# SPATIAL AUTOCORRELATION

- Model parameter estimates assume that samples are independent
  - Often acknowledged, but rarely explored
  - Not taking into account spatial autocorrelation leads to biased results  
e.g. parameter estimates ~25% different (Dormann et al. 2007)
- ➡ Biased estimates of abundance



# SPATIAL POINT PROCESS MODELS

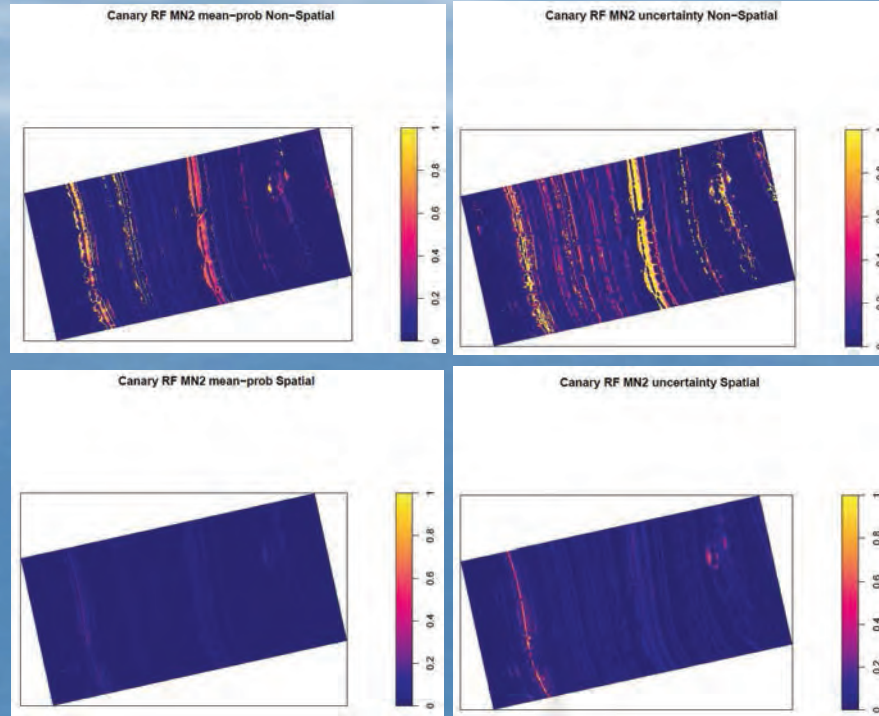
- Spatial model where occurrence of individuals (e.g. fish) are modeled as points across a landscape, taking into account the spatial structuring
- Models the intensity (i.e. the number) of fish expected to occur in an area given the weighting of all other covariates
- Allows prediction of the total number of fish (i.e. abundance) across an area and where they are likely to occur





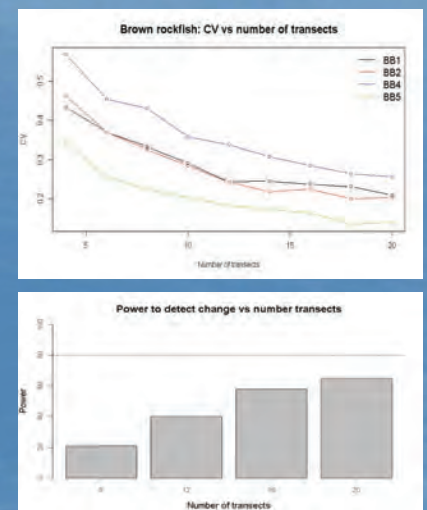
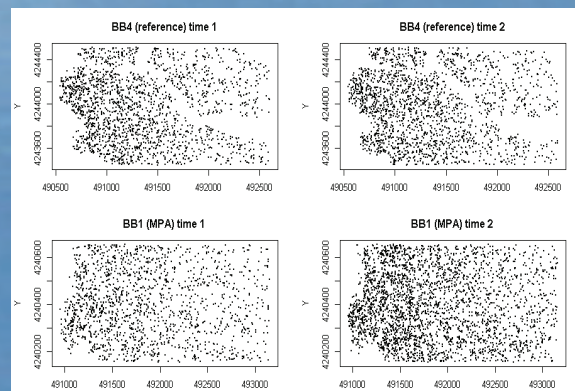
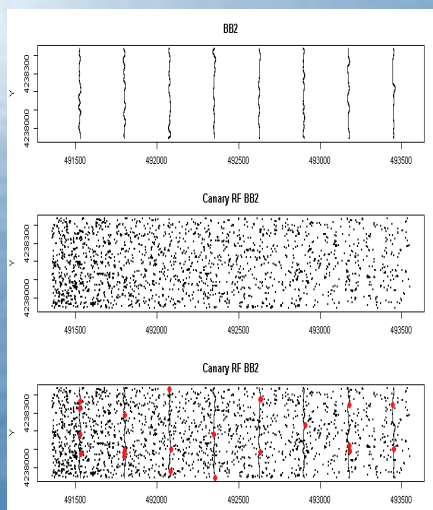
# MODELING APPROACH

- Exploration of important bathymetry derived covariates using multiple sites within a region:
  - Depth
  - Habitat and distance to hard substrate
  - Bathymetric Profile Index (BPI) – different scales
  - VRM and other measures of rugosity
  - Slope and curvature
  - Aspect
- Modeling of spatial effects at the individual site level
- Comparison of non-spatial and spatial models



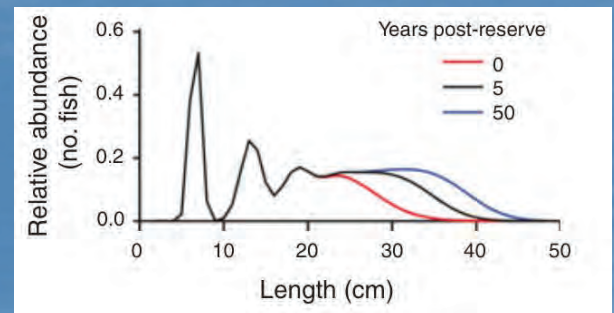
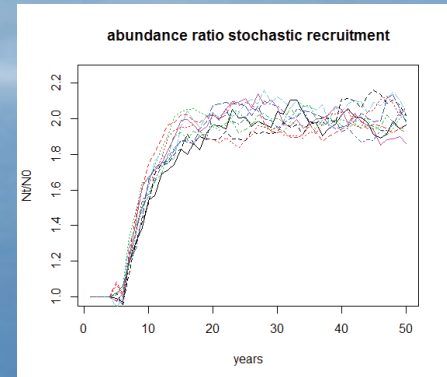
## 2. SURVEY AND SAMPLING DESIGN WITH A ROV

- Building on the previous work, using model parameter estimates, we can simulate fish distributions across sites/regions
- Test different designs and sampling effort
- Simulate changing abundance and/or size distributions



## SIMULATION: TIME-SERIES AND POWER TO DETECT CHANGE

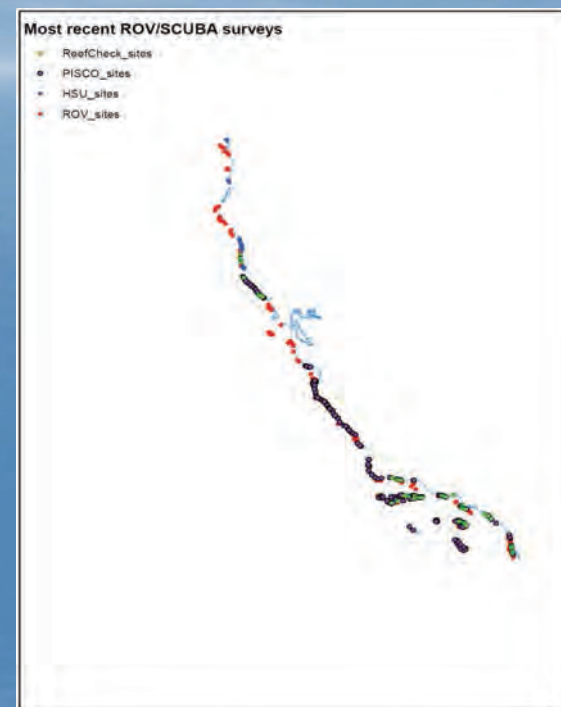
- Based on work by the other postdocs we can simulate a time-series of data of expected recovery inside a MPA – abundance and size structure
- Test power to detect change
- Need to decide on:
  - Species to model
  - Sites
  - Designs



Figures taken from presentations by Katie Kaplan and Will White

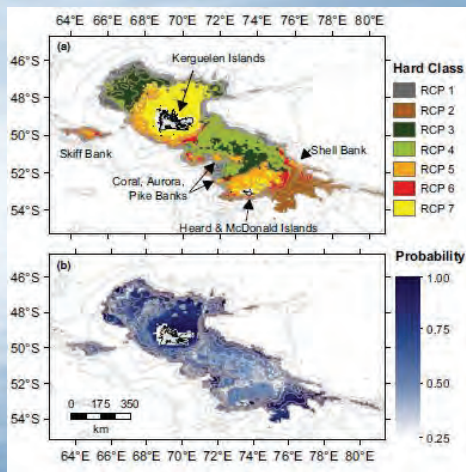
## 3. ECO-REGIONALIZATION OF SUBTIDAL COMMUNITIES

- Combine:
  - ROV and SCUBA data sets
  - Oceanographic variables: SST and indices, fronts, Chl a, SSH
  - Habitat – 1 km cells
- “Regions of Common Profile” (RCP) model:
  - Allows sampling effects to be incorporated
  - Data driven map of eco-regions across the state
  - Places MPA and reference sites in broader context
  - May aid in site selection: representative sites and/or replication within eco-regions

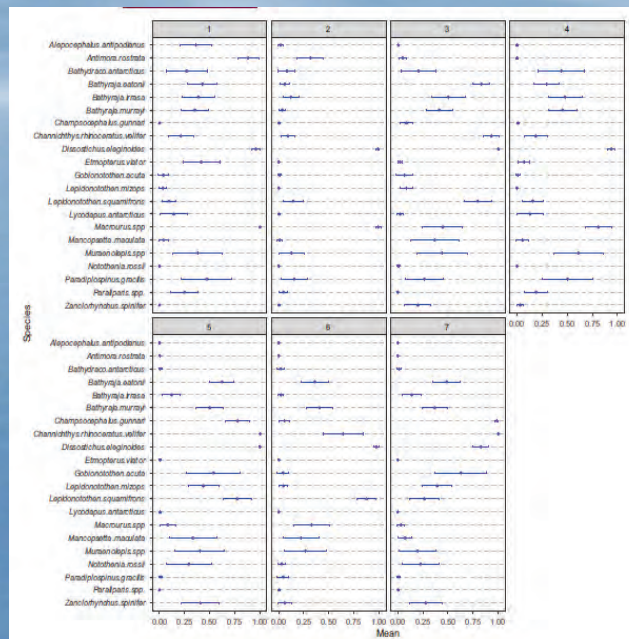




# RCP MODEL: EXAMPLE OUTPUT

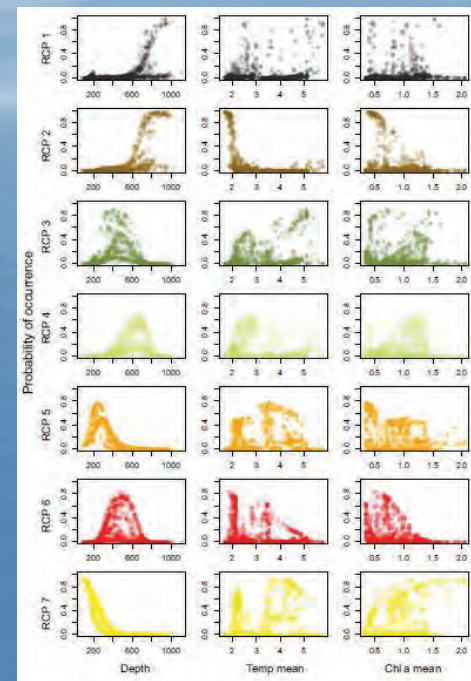


Mapped groupings and uncertainties



Species contributions to groups

Figures taken from Hill et al. (2017)



Environmental drivers for groups

## ECO-REGIONS AND MONITORING

- We may expect regions with similar assemblages and environmental conditions to have similar responses
- Models that take eco-regions into account have been shown to have higher power to detect MPA effects
- Potential to link community changes over time to changing environmental/oceanographic conditions

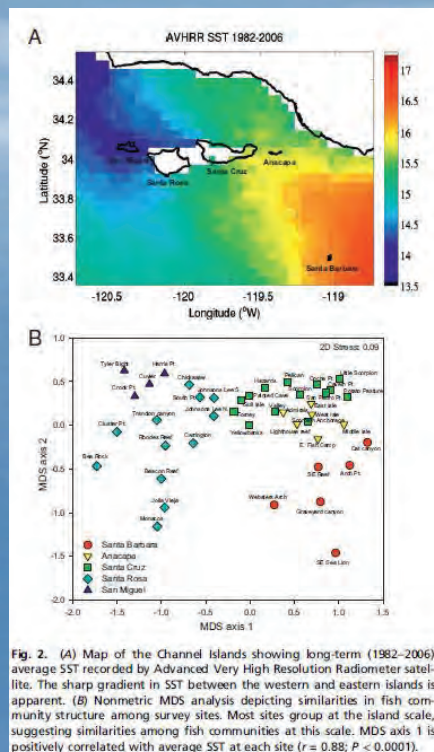


Fig. 2. (A) Map of the Channel Islands showing long-term (1982-2006) average SST recorded by Advanced Very High Resolution Radiometer satellite. The sharp gradient in SST between the western and eastern islands is apparent. (B) Nonmetric MDS analysis depicting similarities in fish community structure among survey sites. Most sites group at the island scale, suggesting similarities among fish communities at this scale. MDS axis 1 is positively correlated with average SST at each site ( $r = 0.88$ ;  $P < 0.0001$ ).

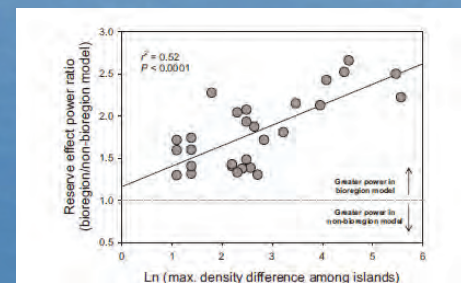


Fig. 3. Relationship between the reserve effect power ratio (power in bioregion model/power in nonbioregion model) and the maximum difference in a species' density across the Channel Islands (values from Table S3). In all cases, the power to detect reserve effects is improved by controlling for biogeography (i.e., all points occur above the dashed line, indicating improved power in the bioregion model). Statistical power increases most for species that exhibit strong biogeographic differences in abundance.

Figures taken from Hamilton et al. (2010)

# ECO-REGIONS AND SITE SELECTION

- Understanding broad distributional patterns and their drivers can aid in:
  - Choosing sites so that there is replication within regions (may not always be feasible given budget and logistical constraints)
  - Making sure that regions that have distinct species assemblages are included in long-term monitoring plans (MLPA obligations)
  - Ensuring that reference sites are truly comparable in terms of communities and environmental drivers that are likely to influence them over time
  - Linking to connectivity matrices: do eco-regions regions = regions with ROMs connectivity?



Appendix H:

**PROCEEDINGS OF  
THE REGIONAL OCEAN  
MODELING SYSTEM  
OVERVIEW WORKSHOP**

# **Proceedings of the Regional Ocean Model System Overview Workshop**

August 10-11, 2017  
Long Marine Lab, UC Santa Cruz



**Hosted by California Department of Fish and Wildlife  
Marine Region**

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### Proceedings of the Regional Ocean Model System Overview Workshop

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Day 2: Integration Projects Update.....	8
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Appendix B: Workshop Detailed Notes .....	12

## Workshop Participants

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### University of California, Santa Cruz (UCSC)

Mark Carr and Pete Raimondi

### California Department of Fish and Wildlife (Department)

Becky Ota, Steve Wertz, Adam Frimodig, Sara Worden, Paulo Serpa, Amanda Van Diggelen, Mike Prall, and Leandra Lopez

### University of California, Davis/Department Post Docs

Lauren Yamane, Nick Perkins, and Katie Kaplan

## Acknowledgements

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We extend a special thank you to UCSC, Long Marine Lab for allowing us to use their facility to host the workshop. We also thank Department staff Leandra Lopez for recording detailed notes of the discussions at the workshop.

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## Executive Summary

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Pursuant to the Marine Life Protection Act (MLPA),<sup>1</sup> significant steps were taken to ensure California's marine protected areas (MPAs) were designed as an ecologically connected network. The California Department of Fish and Wildlife (Department) is developing priorities for designing a Statewide MPA Monitoring Program in coordination with the Ocean Protection Council and Ocean Science Trust. A Statewide MPA Monitoring Action Plan (Action Plan) will synthesize quantitative and expert informed approaches to long-term monitoring, and identify a priority list of indicators and sites for long-term monitoring to evaluate the performance of the network at meeting the goals of the MLPA.

The Department convened a workshop titled "Regional Ocean Modeling for Site Selection" in Santa Cruz, California, on August 10-11, 2017. The purpose of this two-day workshop was to facilitate the Regional Ocean Modeling System (ROMS) effort in progress by Dr. Pete Raimondi and Dr. Mark Carr of UC Santa Cruz, and develop a shared understanding for how the Department may utilize their ROMS connectivity modeling results to inform long-term MPA monitoring site selection.

On the first day of the workshop, discussions among the participants centered around 1) understanding how the ROMS model works; 2) reviewing the model results for a subset of priority habitats and indicator species; and 3) discussing the model accuracy and the process for fine-tuning the model to include specific physical and biological parameters. On the second day, UC Davis/Department post-doctoral researchers shared their progress on 1) analyzing and integrating extensive remotely operated vehicle (ROV) data, along with other visual data, to gain insights on MPA performance; and 2) developing effective methods to integrate MPAs with fisheries management. The focus of this proceedings document is to highlight key outcomes and next steps facilitated primarily during the first day of the workshop.

The workshop participants identified core priorities for moving forward on the ROMS connectivity model and eventual long-term monitoring site selection criteria. Next steps include:

- 1) Focusing on modeling planktonic larval duration (PLD) for species that are data-rich and recognized as species likely to benefit from MPAs, focusing on PLDs between 30-60 days
- 2) Fine-tuning the model by integrating specific physical and biological parameters
- 3) Modeling network connectivity both between and within rocky reef habitat types
- 4) Integrating the ROMS modeling results with the state-space integral projection models

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<sup>1</sup> FGC §2850-2863.

## Overview

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California has adopted a two-phase approach to MPA monitoring to track the ecological and socioeconomic conditions in and around the network of MPAs, including Phase 1 regional baseline monitoring and Phase 2 statewide long-term monitoring. A key priority for the Department for Phase 1 is to develop practical, cost-efficient standardized metrics that can be gathered consistently over time. Gathering consistent ecological and socioeconomic information over sufficient time and geographic scales is necessary to evaluate MPA network performance, inform adaptive management decisions, and ensure that the statewide network of MPAs is meeting the goals of the LPA.

A key component of long-term monitoring design is MPA and reference site selection. Establishing long-term data collection efforts at a select set of sites to better track MPA network performance over time will help inform adaptive management in a manner that is scientifically rigorous, cost-effective, and consistent with MLPA goals.<sup>2</sup> Leveraging existing partnerships and capacity of academic partners in this project will lower costs and ensure a scientifically robust product that meets or exceeds the scientific standards established by the state in order to effectively evaluate the performance of the MPA network.

Dr. Immondi and Dr. Carr (PIs) of the University of California Santa Cruz (SCS) have been tasked with developing long-term monitoring site recommendations inside and outside MPAs statewide to most efficiently support MPA network evaluation. These recommendations include:

1. Minimum number of sites that will support an assessment of condition and trends to evaluate the progress of the statewide network at meeting MLPA goals within the ten year management review time frame;
2. Siting recommendations that will support a more robust assessment of condition and trends to evaluate the progress of the statewide network at meeting LPA goals within the same time frame;
3. Siting recommendations that will support a comprehensive assessment of condition and trends to evaluate the progress of the statewide network at meeting LPA goals and explicitly links to other state priorities.

The PIs have opted to use the global ocean modeling System (ROMS) as one tool to evaluate connectivity of California's rocky intertidal habitat shallows, rock-reef/kelp forest habitats (0-30m) and deep rock habitats (30-100 m) as driven by oceanographic currents. The proceedings from this workshop are summarized below.

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<sup>2</sup> FGC 2853(c)(3)



## Day 1: Developing an Understanding for MPA Site Selection Criteria

### 1. ROMS based connectivity matrix overview: Network analytical approach to spatial sampling design

The ROMS framework is a free-surface, three-dimensional, primitive equations ocean model widely used by the scientific community for a diverse range of applications. The PIs are using the ROMS model to evaluate connectivity of rocky intertidal habitats, shallow rocky-reef/kelp forests habitats (0-30m) and deep reefs (30-100 m) and its drivers oceanographic conditions. In simpler terms, the ROMS model allows us to take the basic assumption that larvae are clearly moving around oceanographic currents, and then assess where those larvae parcels are moving over a set period of time.

Detail ROMS model approach:

1. The western Pacific Ocean is divided into eight regions ranging from Canada south to Mexico.
  - a. Each region is divided into a number of 5km cells along its coast (there are 57 cells in total in the Gulf)
  - b. Mexico and Canada are included in the model because they are clearly subject to ocean currents and are not constrained to state/country borders.
2. The ROMS model simulates the release and movement of planktonic larvae from each cell under different temporal scenarios with respect to its salinity, planktonic larval duration, PLD and oceanographic conditions
  - a. Parcels can move in any direction (3-Dimensional movement)
  - b. Oceanographic conditions are average annual conditions over 15-years (1999-2013)
    - i. Current time period to model oceanographic conditions avoids major El Niño events, but these can be added to the model, or run separately, to simulate planktonic movement during anomalous years
  - c. Over the 15 year period approximately 88000 larvae parcels were released from each cell, within each iteration
    - i. Settlement of larvae depends on the PLD; PLD's can last from 5, 10, 15, 20, 30, 45, 60, 90, 120, 150, or 180 days
      1. ROMS model can be used to model PLD for indicator species to trace possible movements in and out of MPAs (Table 1)
      - ii. Larvae parcels either settle (larvae end up in an appropriate habitat) or die
3. The ROMS model currently assumes that habitat is proportional to amount of larval reproduction for species from that habitat (e.g. more kelp forest = more production of larvae species)
  - a. Estimates could (and should) be improved in the future through incorporation of:
    - i. Site specific geomorphology and hydrography attributes such as geology, rugosity, relief, sand scour, wave climate
    - ii. MPA effect—over time protection should lead to increased reproductive production for certain species

## 2. What is an appropriate geographic scale for network connectivity evaluation?

ree primary considerations and needed to determine an appropriate geographic scale for long-term site selection 1) oceanographic drivers (biogeographic scale, ) the demographic life history traits of nearshore species and 3) overlay of logistical constraints access to sites, white sharks etc. While the current ROMS model has eight regions the model shows large regional differences. Participants thought it essential to discuss the current boundaries and adjust them as needed on our current understanding of biogeographic regions.

o r near the time of MPA implementation, baseline monitoring data was collected in each of four coastal regions the north coast (OR-CA border to Eureka, 2013-2016) north central coast Eureka to Pigeon Point, 2010-2012 central coast (Pigeon Point to Point Conception, 2007-2011), and south coast Point Conception to the US-MEX border, 2011-2013). However these divisions were selected during the MPA planning period in order to divide the California coast into reasonable geographies from a planning logistics perspective not a biogeographical one. In order to better define bioregions informed by clusters of similar otolith or shop participants selected new regions for consideration in connectivity modeling. These new regions are the north coast (OR-CA border to Pismo Mendocino), north central coast Pismo to San Francisco Bay), south-central coast San Francisco Bay to Point Conception) and south coast Point Conception to the US-MEX border.

## 3. How will long-term monitoring sites be selected?

With long-term monitoring regions established, the Pls will use the ROMS model to determine how cells connect to all other cells using source-sink dynamics so source cells considered a cell are larval particle distribution has a higher rate of connectivity with all other cells essentially larvae distributed from this cell disperse and settle to a disproportionate number of other cells (Figure 2). Since cell exhibits the reverse trend, are larval particle distribution is low, but larval particle settlement from other cells is high. To determine if the network dispersal connectivity, a mixture of both source and sink locations is recommended for site selection.

Pls will use the ROMS model to determine which cells are contributing significantly as source locations both within the respective region as well as statewide. This includes running the ROMS model for PLDs which primarily fall within the 30-60 day larval duration period; how larvae connect within the same habitats i.e. cell connectivity from one rocky intertidal habitat to another rocky intertidal habitat; as well as between habitats (i.e. cell connectivity from rocky intertidal habitat to shallow rocky-reef habitat).

MPAs and reference sites that have the following criteria are likely to be good indicators of MPA network connectivity and should be considered for long-term monitoring sites:

- High degree of connectivity with other cells providing statewide connectivity over regional connectivity
  - Source locations will be prioritized for cells south of Cape Mendocino as these are the locations that will be connecting the network through propagule distribution

- Single locations will be prioritized north of proposed Mendocino County source cells north of proposed Mendocino County but not more to the east and Washington waters and are outside the evaluation of California's MPA network connectivity
- Multiple habitats represented within the boundaries
  - MPAs with multiple habitat types allow for cross collaboration on monitoring projects and can help determine how marine ecosystems and species move across different depths and habitat types
- Historic monitoring data are available
  - MPAs and reference sites with historic data available will allow for data sets to be expanded temporally increasing the available information to help determine network performance for meeting the goals of the MLPA
- Sites are accessible for long-term monitoring i.e. the site safe to monitor
  - Once criteria are met, until researchers cannot physically get to the location there will be little utility in selecting that MPA or reference site as a long-term monitoring location



Figure 1. Eight regions assigned for the ROMS MPA network connectivity model

Table 1. Planktonic larval duration (PLD) of potential indicator species for network evaluation

PLD	Potential Indicator Species
10 DAYS	d and l ack a alone
20 DAYS	arn acles
30 DAYS	California mussel, asses
45 DAYS	California sheeh ead
60 DAYS	Nearshore rockfishr ed and u r le sea urhcins
90 DAYS	Yellowtail rockfishrr ock crabll ingcod
120 DAYS	l ue rockfish

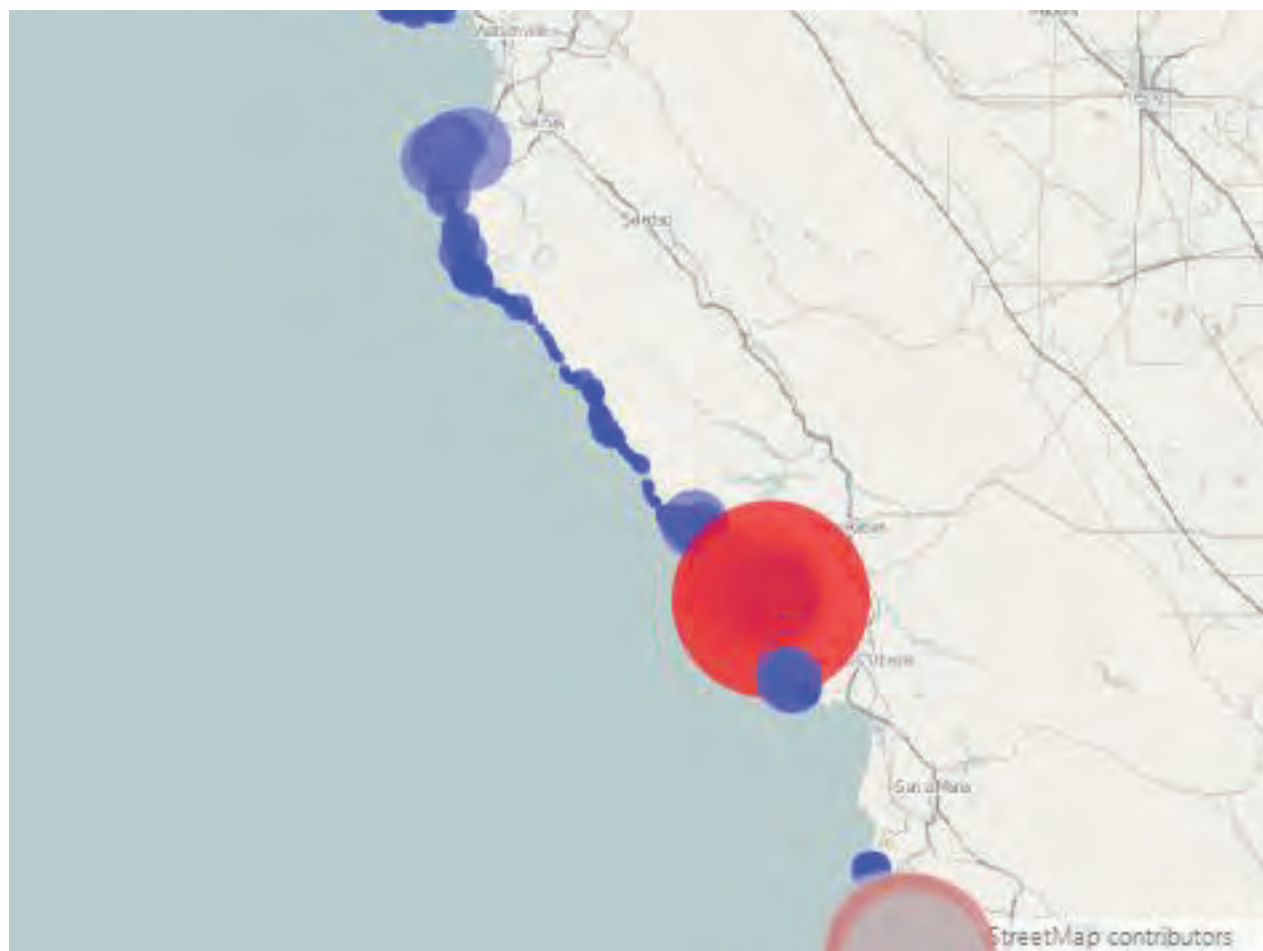


Figure 2. Effect of planktonic larval duration (PLD) on network connectivity; shallow rocky-reef habitat with a PLD of 60 days. Bubble size indicates the degree of connectivity with other cells, with larger bubbles indicating areas of greater connectivity (source populations).



## Day 2: Integration Projects Update

MPA managers and artists are interested in learning from regional baseline monitoring efforts and seeking resolution from a statewide network effective, to discuss the best approach for arriving at a select set of MPAs throughout the network. Three, one-year contracts for post-doctoral fellows with a background in MPA data synthesis and integration began in early 2017 to aid in statewide long-term monitoring planning. The three projects focus on

1. Analyzing and integrating extensive remotely operated vehicle (ROV) data to gain insights on MPA performance
2. Develop effective methods to integrate MPAs with fisheries management; and
3. Helping to develop the Action Plan to inform long-term statewide MPA monitoring.

Two of the three post-doctoral fellows were able to attend the workshop and provide an update on their progress to help inform the evaluation of the MPA network at meeting the goals of the MLPA

### 1. Deep-water habitat surveys with ROVs: Spatial point process models for benthic visual survey and sampling design

*This project focuses on the analysis and integration of an extensive ROV data set collected by CDFW and Marine Applied Research and Exploration to gain insights on MPA performance to date and inform the creation of the Statewide MPA Monitoring Action Plan.*

data needed to be conditioned for ongoing development of spatial analyses to examine species density at hard bottom index sites inside and outside of MPAs. Now that data conditioning is complete, spatial point process models can model ROV transect data and bathymetric layers. A model simulation was presented for rockfish in the Bodega Bay area. The simulation informs understanding of ROV transect efficiency, number of transects needed to achieve similar results between Optical and video landers and number of transects necessary to achieve a statistical power that will show significant results over time. While a scarcity of data associated with some species can lead to high model uncertainty, spatial point process models may be useful as a power analysis to decide final sampling design for the deep water MPA monitoring program.

Workshop participants recommended

- ROVs be used over video landers due to the amount of data that can be collected within the same period of time;
- The model be expanded to simulate/test other areas; and
- Incorporate information such as fishing effort to project changing abundances

### 2. Integrate MPAs with Fisheries Management: Assessing MPA effectiveness and integrating MLMA-MLPA

*This project focuses on the development of effective methods for the integration of MPAs with fisheries management. The development of quantitative approaches to integrate the ocean health goals of the*

*MLPA with ecosystem-based fisheries management requirements of the Marine Life Management Act in fishery management plans is the goal.*

In order to assess MPA effectiveness local fish mortality rates are being modeled. Local mortality rates can be estimated by looking at fish species size distributions over time and modeling size structure changes by taking into account both natural mortality (i.e. disease, old age, predation) and fishing mortality (removal of fish from a stock by fishing). High fishing mortality will be a problem in areas where fewer large old fish are present. By modeling mortality rates, pre-MPA annual recruitment rate can be estimated to help establish transient population dynamics.

Workshop participants recommended:

- Looking to re-evaluate for particular minimum size of indicator species
- Choosing species that have strong data sets and avoid certain species with missing size distributions as based on cryptic size classes
  - Double-crested blue rockfish, and scorpionfish were identified as species with strong data sets
- Considering the need to model recruitment data

### 3. Develop the Action Plan to inform long-term, statewide MPA monitoring

*The third project will focus on the development of the Action Plan that will inform the approach to long-term monitoring of the statewide MPA network. The creation of the Action Plan, which will identify the sites and temporal frequency of sampling and metrics, needed to evaluate network performance and inform the adaptive management of California's MPA network.*

## Next Steps

The immediate primary purpose of the workshop and MMS connectivity model along with post-doctoral contracts is to assist the state in identifying priority monitoring parameters and sites to include in the Action Plan, which is anticipated to be released in 2018. MPAs and reference sites should also be selected to represent and span important biogeographic features along the coast because there are many definitions of biogeographic regions and the MLPA planning regions are not based strictly on biogeography. The group suggested that selection of MPAs to be monitored should not be constrained by the MLPA planning regions but rather using newly drawn borders or a statewide focus as required by the MLPA. The group should also work to incorporate potential MPA effects into the ROMS model (increase production in any given cell) and look both within and between the three types of habitats. At least one other workshop, if not more, will likely be needed to continue fine-tuning the model to display MPA network connectivity statewide.



## Appendix A: Workshop Agenda

### ROMs Model Workshop Agenda

Long Marine Lab, UC Santa Cruz  
115 McAllister Way, Santa Cruz CA 95060  
August 10-11, 2017

#### Participants

**UCSC:** Mark Carr and Pete Hammond

**CDFW:** Becky Ta, Steve Wert, Adam Immodig, Sara Worden, Paula, Amanda, Iggelen, Mike Prall, Leandra Lope

**UCD/CDFW Post Docs:** Lauren, Jane, Nick Perkins, and Katie Kaplan. She will try to join us for some of the time via phone

#### Workshop Activities

##### **Day One:**

- Review understanding of how the ROMs model works
- Review model results for a subset of priority habitats: indicator species, PLDs, and sources/sinks for indicator species
- Discuss model accuracy and parameters: the process for fine-tuning the model to include specific physical and biological parameters and integrating the model with other work (i.e. post-docs' projects, CDFW MPA habitat spreadsheet)
- Identify next steps for how to best use the model to inform the statewide MPA Monitoring Action Plan

##### **Day Two:**

- Presentations by post-docs on MPA Monitoring Action Plan, MLMA and ROV projects
- Discuss post-doc projects alignment with state priorities and interaction with M's model

#### **August 10: ROMs Model Overview and Brainstorm Session**

10:00-5:00: Center for Oceanic Library room 01 (upstairs to the left)

10:00-10:10	Introductions and logistics for the day
10:10-11:10	Presentation: M's model overview and question/answer session
11:10-11:25	BREAK
11:25-12:30	Presentation: Model results for priority habitats: indicator species, sources/sinks with time for questions
12:30-1:00	LUNC

1:00-2:45	oo up Discsi on a rai nstorm: Pre iminary res ts, mode accurac , i ne tn ing the mode , action p a ierr ation
2:45-3:00	BREAK
3:00-4:30	Continue Group Disc ssion a rai nstor
4:30-5:00	Ne t steps
5:00-???	pti ona team activity

### August 11: CDFW/UCD Post-docs Project Presentations and Discussion

8:30-11:30, Ceer for ce a al th ibrary, room 01

8:30-8:35	Welcome
8:35-9:30	Preseati on Nic a Mike): ROV wor worho p over iew a d r oup questions
9:30-9:40	BREAK
9:40-10:30	Preseati on La re: MLMAc tion Pla a r oup questions
10:30-11:30	oo up Discsi on: Project alignme with state priorities a d ROMs mode

## Appendix B: Workshop Detailed Notes

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### Regional Ocean Model Workshop Notes

Long Marine Lab, Santa Cr  
August 10-11, 2017

### Participants

**UCSC:** Mar Carr and Pete Hammond

**CDFW:** Bettya, Steve Wertz, Adam Frimodig, Sara Worde, Paulo Serpa, Amanda Va Diggele, Mike Prall, and Andrea Lopez

**UCD/CDFW Post Docs:** Lauren Yamane, Nick Perkins, and Katie Phillips (telephoned in)

**Note Taker:** Andrea Lopez

### Workshop Outcomes

#### Day One:

1. Identified a deeper understanding of how the OMs modelors through a presentation about and live example outputs produced from the code.
2. Developed a list of priorities for the Action Plan:
  - Identify the MPAs that are the largest sources
  - Model a range of PLDs that produce the most accurate results across the three priority habitats
  - Examine MPAs regional statewide contributions
  - Model connectivity by decided on bioregions
  - Recommended ROM statewide as tier 1 and regional as tier 2 to identify statewide outcomes
  - Important to include model by interacting specific physical and biological parameters, and other work (i.e. post-docs' projects, CDFW MPA habitat spreadsheet)

#### Day Two:

1. Identified a deeper understanding of post-doc projects through presentations and discussions of preliminary simulation results
2. Developed a list of suggested changes to strengthen the projects (see UCD/CDFW Post-Doc action items)

### Action Items

#### UCSC:

1. Produce model outputs for tier priorities (listed under Day 1 workshop outcomes) and feed them into the growth to present at the next modeling/siting workshop.
2. Refine/integrate south coast habitat mapping data into OMS (requires input from CDFW below)
3. Incorporate MPA effect into the model to increase production in any inventory
4. Make referee site selections

5. Overlay criteria on CA map
  - a. Determine if source/priority MPAs are distributed statewide
  - b. How source/priority MPAs align with other design criteria (e.g., ASBSs)

#### CDFW:

1. Provide new list of practical decisions specific to the habitat UCSC is looking for
2. Request habitat mapping data from CDFW
3. Look at top MPAs that rise to the top of the model using MPA criteria spreadsheet
  - a. Determine how feasible it is to monitor multiple habitats at the MPAs identified as priority/source locations
4. Examine overlay with historical data
5. Send Post-docs nearshore information to the California Department of Fish and Wildlife (CDFW)
 

Reanalyze habitat mapping data with OMS cells with WZ updates and additional Point St. George. First step requires pulling data from UCSC)

#### UCD/CDFW Post Docs:

##### ROV Project:

1. Link the temporal variance between the MPA and reef site transect simulation

##### MLMA/MLPA Integration

1. Examine and choose more appropriate fish data or minimum catch and recruitment sizes
2. Create model outputs in other data rich or catch species like abalone
3. Consider modeling recruitment data

## Critical Dates

Next Workshop tentatively planned for January 2018

## Meeting Summary

### Presentation by Pete Raimondi: *Network analytical approach to spatial sampling design*

#### Presentation Overview

- Walk through the regional-scale Modeling System (ROMS) and habitat-based modeling system that will inform network-based evaluation of California's MPAs
- Provided background on the "construction" and function of the model
- Demonstrated some initial outputs from the model including leave source connectivity contribution ("source") vs settlement ("sink") based connectivity (connectivity index) based on planktonic larval durations (PLDs). The PLDs range from 5 to 180 days
- Demonstrated model output for PRIORITY MPAs identified by CDFW these demonstrations offered insight into the importance of time and spatial scales
  - Model biases exist on the north and south borders due to a lack of data from Mexico and Oregon.
  - Northernmost cells mainly contribute to retention but not California
  - Statewide vs Regional PLD contribution outputs for some Priority MPAs were drastic (Point Arena as an example), highlighting the significance of looking at the model on a regional scale

- ii. The model output will be prioritized state-wide looking at a regional perspective will ensure site selected can provide good source populations both on a small and large scale

## Q&A, Group Discussion, and Brainstorm:

### Main Discussion points

1. Initially questions were asked about overall goals of the use of the M-S model and as to best frame the assessment of the Network

estimations raised:

- a. the network performing in some way?
- b. what are some of the ways to measure network performance?
- c. Does the network contribute to areas that have been overfished?
- d. In what way does the network contribute to the sustainability of other MPAs?
- e. How important are the overall contributions relative to the regional contributions?

Conclusions:

- a. Focus should begin from a broad perspective in order to address management goals
- b. the conceptual design of the CA MPA network called MPAs to be scaled such that the sections within could replenish stocks inside of MPAs thus the assessment should be based on this assumption
- c. target and monitor MPAs that the model identifies as important sources for replenishing other MPAs because these subsequently replenish non-MPA areas
2. Importance of sink sites and their relevance to monitoring
  - a. Sinks represent an important aspect of the resiliency of the network. Large sinks may offer protection to certain populations promoting their persistence in times where source populations decline
  - b. Monitoring sinks is going to depend on the stage for which monitoring is conducted
  - c. Viewing which MPAs are important sinks may be useful criteria for determining Tier II sites
3. Importance of appropriate PLD lengths for use in assessing the network
  - a. sample outputs show the value of viewing the model at different spatial scales and PLD lengths and lead the group to discuss what spatial scales
  - b. the group discussed the merits of different PLD lengths noting that shorter PLD lengths especially as short as 10 days don't have much of a network effect but do allow for self-recruitment
  - c. Longer PLDs especially as long as 120 day lengths highlight the network effect but don't capture
  - d. Model outputs using PLDs from 0 to 60 days could offer insight appropriate to the needs
4. assigning regional biogeographic boundaries
  - a. sample outputs on a regional scale used boundaries based on MLPA distinctions and seeing the drastic differences Priority MPA sites had on a state-wide vs regional scale lead the group to decide that regional boundaries should be reassigned based on stronger biogeographic realities
  - b. **\*New\*** biogeographic regions

- i eoo n border to pe Mendocino
  - ii pp e Mendocino to F
  - iii SF to Point Conception
  - iv Point o nception to Me ico
- 5. Direction of monitoring efforts if ROMS analyses shows particular sites to be of higher importance
  - a w as discussed that OM's results alone would not drive a drastic change in current monitoring proec t site selection until a strategy was fully incorporated in the t ion lan
- 6. st ways to compare MPAs and how to choose reference sites
- 7. Habitat specifics and attributes
  - a Discussed the relevance of multi-beam data for 0 to 100m rock habitat

#### *Example Outputs that we examined*

- 1 Contribution y-ai s vs MR (x-ai s)
2. Contribution y-ai s vs No-ke MCA x-ai s
3. Mean ontribution x-ai s vs I MPAs x-ai s on the central coast
4. Mean contribution of L MPAs at ewide rei onal contribution across the PLD ran e
5. Mean rei onal contribution mean contribution vs protection

#### *Possible Model Tweaks:*

- 1 Site specific geomorphological attributes
2. MPA effect (even site specific factors)
3. Look at sink factors over source north of endocino in order to help decide appropriate monitoring sites
4. Toggle feature ?) for comparing tw ork with and without MPA effect
5. How to factor in MPAs whose historical area was smaller but are now larger

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### *Presentation by Mike Prall: ROV work and workshop overview*

#### *Presentation Overview:*

- ii ng CIAP data 2014-2016 Looking at biogeographic analyses
  - Looking at fish spg opherbr own canaryll ingcod, u illback yelloweye latitudinal breaks
- 2<sup>nd</sup> Deep ater onitoring orkshop – June 2017
  - Provided the state with tool MPA recommendations for long-term monitoring of deep-water habitats
  - Discuss various tool and analytical technique combinations for conductin deep-water MPA monitoring
    - ROV, manned sub, video lander video sled
  - Articulated the tradeoffs between different approaches
  - Made recommendations for site selection

#### *Q& A, Group Discussion, and Brainstorm:*

#### *Main Discussion points*

- 1 ROV Methodologies and R v ideo review

2. How much do we need to sample?
  - a. Statistical power – effect size –
3. How do we calculate a mean density for a given site or MPA?
4. How do we model spatially specific data to reduce underlying variability?
  - a. ROV in situ data
  - b. Bathy survey data

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Presentation by Nick Perkins: *Spatial point process models for benthic visual survey and sampling design*

Presentation Overview

- Nick provides overview of spatial point process models and their relevance to long term MPA monitoring, sampling design, and tool comparison
- Model uses ROV transect data and bathymetric layers
- Demonstrates model simulation using brown rockfish. The simulation informs understanding of ROV transect precision, number of transects needed to achieve similar results between ROVs and video landers, and number of transects necessary to achieve a statistical power that will show significant results over time

Q&A, Group Discussion, and Brainstorm:

*Main Discussion Points*

1. Comparing Lander drops to ROVs including number of transects,
2. Difficulty of realizing a network effect
  - a. Thinking of more maybe you have a specific bioregion
  - b. \*\*Decades to detect statistical power from sampling\*\*
  - c. Issues with comparing sites. Spatial vs treatment level
3. Rugosity and relief and its effect on sampling efforts
4. Effect of ROMS model on spatial point process model – possibly providing more predictable trends

*Model Tweaks*

1. link the temporal variance structure between the MPA and reference site transect simulation

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Presentation by Lauren Yamane: *Assessing MPA effectiveness and integrating MLMA-MLPA*

Presentation Overview

- Provided an overview of their project's work to assess MPA effectiveness while also addressing goals of the MLMA; to shape upcoming MPA monitoring in a manner that ensures the collection of relevant fisheries management information
- Gave an overview of the rationale behind their approach which focuses on finding local fishing mortality rates
  - Can look at size distributions over time and estimate fish mortality rate (size structure changes)



- o Cook Assessments traditionally have fishing mortality rates for much larger areas
  - o can help determine the rate at which the population is expected to replenish itself
  - o this model can help estimate the pre-MPA recruitment annual rate – necessary for establishing the transient population dynamics
- view an overview of the State space Integral Projection Model (SSIPM) and its two main components- the Process model (IPM) and the observation model and the work of Kerry Ichols that describes the expected timelines for populations to “fill in”
- this conveys the impacts of her work on measuring sample size and the effect on the model’s performance- for some species the model fits very well others not so well
  - o Maybe there are a handful of “indicator” species that could act as good indicators of local mortality
- Examining simulations from different species Issues black & yellow
  - o For 0.05 its never a very good fit (likely variability in recruitment is swamping out recruitment in the size structure)
  - o Need to figure out why certain simulations aren’t fitting very well
  - o Why is it fitting better at higher f

### Q&A, Group Discussion, and Brainstorm:

#### Main Discussion Points

1. Minimum catch size for fish what data to reference and the many considerations that may have to be taken into account when choosing a size
  - a. Data and things to consider included Survey and landing data stock assessments fishing style changes release mortality, high grading live fish fishery and gear types
  - b. recommended to look to regulations for particular minimum sizes
  - c. Does the model need a hard number for this parameter or could a Bayesian input be considered?
2. More on accuracy of given parameters and choosing species that have strong data sets Missing size distributions used on certain size classes for certain species
  - a. e.g. i. let has a worksheet about species life histories
  - b. d. alone recommended as focal species
  - c. How much info is needed to know about YOYs
  - d. proportion fish recruitment data is available to a very fine scale (to the cm)
3. recruitment data what data to reference what other parameters should be considered when choosing recruitment size
  - a. certain species recruitment is episodic leading to gaps and absence of fill-in rates
  - b. reference of recruitment is because it is dependent on time of year
4. Modeling recruitment: Is there a feedback added upon the other MPAs that are in the vicinity? Is it all driven by death or input Are there two ends to the MPA effect or is it all driven by recruitment?

#### Model Tweaks

1. Consider limitations of fish data for minimum catch size recruitment size
2. Consider using data rich focal species like alone
3. Consider modeling recruitment data
4. Determine why certain simulations aren’t fitting well

# Attachment 4

## MARINE PROTECTED AREA MONITORING ACTION PLAN

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### Summary of Peer Review Comments Received and Responses

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Document prepared for  
California Fish and Game Commission Meeting  
October 17–18, 2018

September 21, 2018

# About this Document

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The *Marine Protected Area Monitoring Action Plan*<sup>1</sup> (Action Plan) was developed by California Department of Fish and Wildlife (CDFW) and California Ocean Protection Council (OPC). Since February 2018, CDFW has regularly updated the California Fish and Game Commission (Commission), and the Commission's Marine Resources and Tribal Resources Committees about the draft Action Plan. CDFW sent notification letters to all federally recognized California Native American Tribes on February 27, 2018. The draft Action Plan was distributed to California Native American Tribes that requested it on July 9, 2018 and was made available to the public on July 16, 2018.

The draft Action Plan underwent a simultaneous public comment period and scientific peer review during July and August 2018 (see Attachment 1 for a summary of public comments received and responses<sup>2</sup>). A scientific peer review panel was assembled and administered by California Sea Grant. The panel was made up of experts in ecology, oceanography, fisheries, biological monitoring and MPA performance evaluation. The panel was provided four overarching questions (included in Table 1) about the approaches outlined in the draft Action Plan to guide their review, which occurred during July. California Sea Grant held a panel review meeting on August 7, 2018. They delivered their final report to CDFW and OPC on August 15.

The purpose of this document is to inform potential Commission discussion and action at their October 17-18, 2018 meeting in Fresno by summarizing peer review panel comments and draft responses by CDFW in the revised draft Action Plan<sup>3</sup> (Table 1).

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<sup>1</sup> California Department of Fish and Wildlife. (2018). *Draft Marine Protected Area Monitoring Action Plan*. July 12, 2018.

<sup>2</sup> California Department of Fish and Wildlife. (2018). *Attachment 1: Summary of Public Comments Received and Responses*. Document prepared for the California Fish and Game Commission meeting, October 17-18, 2018.

<sup>3</sup> California Department of Fish and Wildlife (2018). *Revised draft Marine Protected Area Monitoring Action Plan*. October 4, 2018.

Table 1. Peer review comments received by CDFW on the draft Action Plan on August 7, 2018, following a scientific peer review. The column on the far right (in green) shows how each comment was addressed.

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
<b>Question 1: Are the metrics selected clear and well supported by the best available science?</b>			
1	2.3	Information included in indicator questions table in Appendix B could be better summarized at the beginning of section 2.3. It would also help to provide justification for the metrics listed in the text.	A subset of indicator questions and the related MLPA goals from the "Performance Evaluation Questions and Metrics" table in Appendix B were added to the introductory paragraph of this section as examples.
2	General	Include Marine Life Protection Act (MLPA) goals within the text.	Box 1 in section 1 includes MLPA goals
3	General	Linkages among the goals, questions and indicators need to be stronger as a key part of understanding rationale for metrics.	See response to comment 1.
4	2.3, general	Distinguish between measured and derived indicators. The term "metric" is used interchangeably throughout the document to describe both specific data collected as well as indices derived from these data. Example: Temperature anomaly is a metric while temperature is a measure. Would be useful to distinguish between data collection and data summary/analyses	The title for this section was updated to "Key Performance Measures and Metrics" and each term is defined in text and the draft Action Plan glossary.
5	Appendix B	In some instances, models are included as indicators. Distinguish between the data needed to run the model from the actual model output	Additional data measures were added to Table 1 in Appendix B as examples of the types of data needed for running specific models.
6	2.3 (metrics)	Better define functional diversity	A definition of functional diversity was included in the draft Action Plan glossary, and a brief definition was added to the list of community level metrics in section 2.3.
7	2.3 (metrics)	Consider defining trophic structure, food web integrity, recovery, and resilience as important functions that are linked to MLPA goals. Would help better inform public and potential applicants for funding.	This type of detail will be included in the Request for Proposals (RFP) and Request for Qualifications (RFQ) proposal solicitations when appropriate.

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
8	RFQ/RFP	Suggest addressing reference time periods and statistical power issues at some point. For some measures it might be inappropriate to use 1999 as a breakpoint, as some species were depleted well before that, and for others, there are novel stressors introduced later.	Comment noted for RFP/RFQ proposal solicitations.
9	2.3 (metrics)	Add "abundance" to list of biological metrics.	The list of key biological metrics in section 2.3 was updated to include "Abundance."
10	2.3 (metrics)	Change "size frequency" to "Size/age frequency" to list of biological metrics.	This bullet point in the list of key biological metrics in section 2.3 was updated to "Size/age frequency."
11	2.3 (metrics)	Add "spawning stock biomass" to list of biological metrics.	No action. Spawning stock biomass is more specific to fisheries stock assessments and is not a key metric for measuring MPA performance at this time.
12	2.3 (metrics)	Add measures of movement (e.g. tagging, dispersal, larval connectivity) to list of biological metrics.	Comment noted. Movement is established for most of the key indicator species in the program and is not a key metric at this time.
13	2.3 (metrics)	Add measurements of recruitment/settlement/larval supply.	Comment noted. Measurements of recruitment/settlement/larval supply are not a key metric at this time.
14	2.3 (metrics)	Add "Natural mortality" to list of biological metrics.	Comment noted. See response to comment 11.
15	2.3 (metrics)	Add condition indices to list of metrics.	Comment noted.
16	2.3 (metrics)	Clarify that the community level metrics section refers to ecological community.	A definition for functional diversity was added to the list of key metrics which refers to ecosystem functioning, which directly relates back to an ecological community.
17	2.3 (metrics)	Better define functional diversity and stability in community level metrics text	See response to comment 6.
18	2.3 (metrics)	In the physical and chemical metrics text rugosity and slope, oceanographic factors such as wind strength and currents, salinity, nutrients, pollutants, HAB toxins, and carbonate parameters beyond pH may not need to be included in regular monitoring but consider assessing at least once to ensure validity of comparison amongst sites.	The physical metrics and measures listed in section 2.3 are the key metrics at this time, however more oceanographic focused studies may be prioritized in future RFQ/RFP solicitations. A footnote was added to the Chemical metrics and measure that refers to other monitoring plans that focus on water quality issues.

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
19	2.3 (metrics)	Suggested recommendations for current human use metrics list: licenses and registration, landing receipts and fishing logbooks, local fishing mortality rates, targeted and broad-based survey instruments, direct observation of user activities/behavior, social media scraping, marine debris, measures of community well-being, and MPA citations/enforcement actions.	The list of human use metrics in section 2.3 was expanded to include more detailed information regarding a broad range of human uses.
<b>Question 2A: Will prioritizing monitoring on rocky substrate allow for a comprehensive evaluation of California's MPA Network performance in relation to the ecological goals of the MLPA?</b>			
20	2.3	Exclusive focus on rocky substrates alone will not provide a comprehensive ability to evaluate all of the MLPA goals pertaining to all marine ecosystems.	The MPA Network was designed to include a variety of marine habitats and communities be represented and replicated across a range of depths and environmental conditions. Section 2.1 of the draft Action Plan was revised to better describe how Phase 1 regional baseline monitoring was administered across key habitats and human uses and guided by science design guidelines from the MPA design and siting process. The draft Action Plan draws from the MPA design and siting process, Phase 1 monitoring, and additional information to prioritize various metrics, habitats, sites, species, and human uses for long-term monitoring. The draft Action Plan acknowledges, as the panel notes, there are reasons to support an emphasis of rocky habitats over other habitats, such as rocky habitats generally tend to support relatively lower ecological turnover and less motile species. However, the draft Action Plan was revised to better describe the importance, challenges, and opportunities for long-term monitoring across all key habitats.
21	2.3	Human use justification for prioritizing rocky habitats alone is not a strong justification because human use in some non-rocky shore habitats is high in some regions.	Comment noted.
22	2.3	Reduced cost per unit of data for rocky habitats is not a strong argument. There are examples of other monitoring efforts in habitats such as sandy beaches, estuaries that are also cost efficient.	Language regarding cost of sampling in other habitats was added to section 2.3 in subsection "Monitoring in other habitat types" to acknowledge that monitoring in some of these habitats has been costly in the past. The

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
			draft Action Plan recognizes that more cost-efficient methods are emerging.
23	2.3	Better highlight that long-term monitoring will allow for the incorporation of additional habitats as priorities.	Comment noted. The introductory text in subsection "Monitoring in other habitat types" acknowledges that the draft Action Plan does prioritize rocky habitats for monitoring but does not preclude monitoring in other habitat types.
24	2.3	Recommend moving explanation of prioritization of rocky habitats after site selection methods in order to emphasize that this is a result of the methods used.	The paragraph that explains the prioritization of rocky habitats was moved to the end of the site selection methods section.
25	2.3	Recognize potential opportunities for novel approaches outside of rocky habitats to encourage innovation and monitoring across all habitats.	See response to comment 23.
26	2.3	Young, Carr 2015 paper is mischaracterized in the text (argues that shallow water communities in the Central Coast were adequately represented in the MLPA design process, deeper regions were not)	Language was added in the "Tiered Approach" subsection that clarifies most habitats were well represented and replicated.
27	2.3	Suggest moving this section to follow the site selection methods.	See response to comment 24.
<b>Question 2B: Was justification to place lower priority on estuaries, pelagic, deep and soft-bottom well explained and supported by the best available science?</b>			
28	2.3	Panel agrees in principle there are reasons to support emphasis of rocky habitats over estuaries, pelagic, deep and soft bottom habitats, however it was not necessarily well supported. That said, the panel also felt monitoring in non-rocky habitats could achieve some of the goals of MLPA.	See response to comment 20.
29	2.3	Sandy Beaches are not just impacted by land-based factors. Kelp wrack is a strong influence, they are home to mammals and shore birds that directly benefit from healthy ecosystems in MPAs, and they support essential processes such as nutrient cycling. Recommend monitoring as a priority, but maybe not at the same intensity as rocky habitats.	Comment noted.
30	2.3	Sandy Beaches can be more cost effective to monitor, so delete higher cost as a justification for exclusion.	Mention of higher cost in "Monitoring other habitat types" subsection in section 2.3 was updated to pertain to subtidal soft-bottom and deeper habitats.



Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
31	2.3	Deep Canyons/Pelagic ecosystems are important for biodiversity and replenishment of nearshore fished populations. "Highly dynamic" in text should only refer to pelagic systems, not deep rocky reef. Little thought in the document put into deeper ecosystems.	Comment noted.
32	2.3	Justification for not prioritizing estuaries was muddled with a general lack of agreement on methods or cohesive plan. Arguments that apply to prioritizing rocky habitats can also apply to estuaries, so offered rationale for de-emphasizing does not make sense.	The draft Action Plan was revised to better describe the importance and complexities of estuaries across the state, including both challenges and opportunities for long-term estuarine monitoring, and examples of existing long-term estuarine monitoring programs in California. Also see response to Comment 28.
33	2.3	Finding comparable reference sites for estuaries is used as a reason to de-emphasize this habitat, but this same problem can apply to certain rocky habitats and is not mentioned.	See responses to Comment 32 and 28.
34	2.3	Complexity of different types of estuaries as a reason to de-emphasize them is not a strong argument. Rocky habitats are also unique from one and another and called out individually. Why lump types of estuaries?	See responses to Comment 32 and 28.
35	2.3	Suggest calling out 6 consistent monitoring indicators across the four regions for estuaries in the main body of the report.	The draft Action Plan was revised to better describe Appendix C, including articulating the six core estuarine indicators regularly monitored statewide, and additional indicators prioritized for long-term monitoring (see Section 2.3 of the revised draft Action Plan).
36	2.3	Additional recommendations for indicators that are consistently found across estuaries statewide should be listed in the Action Plan.	See response to Comment 35.
37	2.3	Consider adding several additional estuarine indicators, including: detail on marine vegetation, salinity, nutrients and invasive species.	See response to Comment 35.
38	2.3	There are numerous estuarine sites and long-term monitoring efforts that were not mentioned (see examples in panel review report) and were excluded Appendix estuarine report because of 4-year time frame specified for the survey. This time frame seems strict, given the funding cycles laid out in the plan	See responses to Comment 32 and 28.

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<b>Question 2C: Is the justification and design for the socioeconomic monitoring well supported by the best available science and is it feasible (Appendix D)?</b>			
39	Socioeconomic general	Suggest including some interpretation of human use and socioeconomic indicators in the body of the Action Plan. Maybe highlight high level conclusions from Appendix D?	Section 2.3 of the Action Plan was revised to include additional key performance measures and metrics for human use monitoring that directly reflect the recommendations outlined in the human uses report (Appendix D).
40	Socioeconomic general	Because it is mainly included in Appendix D, socioeconomic indicators seem like an afterthought, and is not well balanced with attention given to biological indicators. Suggest refining table in Appendix B to include some of the indicators instead of just referring to Appendix D.	See response to comment 39.
41	Socioeconomic general	Consider including a better description of the socioeconomic monitoring data streams that are already available.	Comment noted. The human uses report (Appendix D) includes examples of existing data streams.
42	2.3	Human use metrics in the Action Plan are not well linked to the indicators called out in Appendix D, so it is not clear how the list of indicators in the document was achieved.	A footnote that refers to the human uses (Appendix D) report was added to the list of human use measures and metrics in section 2.3.
43	Socioeconomic general	Because of significant effort needed to collect and analyze data for socioeconomic indicators, Action Plan should evaluate the value this information relative to other possible types of information. If this has already been done, lay out the process by which this occurred.	Comment noted. The primary purpose of the Action Plan is to prioritize measures and metrics for long term monitoring and does not include mechanisms for specific analyses. Future RFP/RFQ solicitations may focus on cost-benefit analyses of specific methods of data collection.
44	Socioeconomic general	It is not possible to assess effects of specific reserves on human uses the same way you can assess effects on biophysical indicators. This limitation should be called out in the draft Action Plan.	Comment noted.
45	Socioeconomic general	May be necessary to identify key actors and communities to monitor, and human behaviors that are tightly linked to biological metrics. Suggested metrics to include are: compliance (beyond just number of citations issued, i.e. monitoring behavioral changes), using sensors to monitor human use patterns, changes in use patterns, human community resilience (i.e. fishery dependent communities)	See response to comment 39.

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
46	Socioeconomic general	Suggest removing justifications for avoiding certain indicators based on costs.	The justifications for avoiding certain human use indicators based on costs were removed.
47	Socioeconomic general	Balance monitoring costs of MPAs to marine resource users with benefits.	Comment noted.
48	Socioeconomic general	Consider exploring payments for ecosystem services and other indicators and metrics of non-market value.	Comment noted.
49	Socioeconomic general	Because the MLPA is a state law intended to benefit all Californians, it may be important to survey a broader group of citizens beyond direct marine resource users.	Comment noted.
<b>Question 3: Are the sites selected clear and well supported by the best available science?</b>			
50	2.3 Site selection general	Consider re-scaling site ranks where the max value is scaled to 1 and the rest of the values are reported as a fraction of that site's value giving a range from 0 to 1 for each method.	Comment noted. However, this would ultimately lead to the same result since the scaling would lead to the MPAs being ranked in the same general way
51	2.3 Site selection general	The panel strongly encourages evaluation of the Tier 1 sites produced using each method, separately and/or other combinations besides all four methods weighted equally	Comment noted. While there are some MPAs that consistently rank high in each of the four categories, in general dropping one or several of the four methods used would result in a new list of Tier 1 sites. The purpose of the current approach of combining the four criteria together is to identify which MPAs meet several independent criteria across all categories.
52	2.3 Site selection general	It would have been useful to see the raw data for one region, to understand how these point scoring systems influenced the outcomes. E.g. what is driving scores of Tier 1 in MPA design features? Is there a single factor that is driving these rankings or do Tier 1 sites become Tier 1 in very different ways?	Comment noted. All raw data is excluded from the draft Action Plan for all site selection methods. However, this data is readily available for any individual interested in the nuanced results.

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
53	2.3 Site selection general	Is there a need to increase the priority of certain sites because they have these [enforcement] data, and so questions can be answered? Or is there a need to generate these [enforcement] data for all or some sites?	Currently, compliance information is not in a state that can be shown in this draft Action Plan. However, Section 2.3 of the draft Action Plan was revised to include a specific example of an evaluation question regarding the importance of tracking compliance over time (see Section 2.3 of the revised draft Action Plan), and compliance information will be prioritized for future network performance analyses.
54	2.3 Site selection general	Would have been nice to include a fifth ranking method based on socio-economic selection criteria to help integrate their consideration into the site selection beyond fishing (take).	Comment noted. See comment 39. There is limited information on non-consumptive use of MPAs.
55	2.3 Site selection general	The panel strongly agreed stating the known weaknesses and flaws with the current system would strengthen the justification for these methods. This would be useful particularly with Method 2 (historical monitoring), Method 3 (Regional Oceanographic Modeling System [ROMS]) and Method 4 (local historical fishing effort). This underpins the importance of the sensitivity analyses to support why inclusion or adjustment of these categories may or may not influence the results.	The draft Action Plan was revised to call out the deficiencies of each site selection method in section 2.3.
56	2.3 Site selection general	The panel felt it was challenging to understand if the site selection process needed to include consideration of some performance evaluation indicators from each of the MLPA Goals (#6). Should the site selection process seek to incorporate, to the degree possible, all indicators, from all MLPA Goals? Where the ones selected deemed the ones most important?	The draft Action Plan has been revised to address this concern. While the approach attempts to address each of the MLPA goals, the metrics are based on the best readily available data, and therefore have inherent limitations. Also see response to Comment 55

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
57	2.3 Site selection general	The site selection process only focuses on prioritizing research in areas that were well-designed. To truly test the hypothesis of the importance of good design principles, one would need to include low and moderate scoring sites. This process is not included in any of the criteria. Should it be, if this is one of the novel and exciting insights to arise from this process? The contribution of such would be valuable to the larger body of MPA literature.	Comment noted. Section 2.3 of the draft Action Plan and Appendix F describes that state-funded long-term monitoring projects should prioritize the Tier I index sites that align with monitoring project methods. The purpose of the Tier approach is to identify which MPAs are most likely to show an MPA effect after long-term monitoring. Tier I sites should provide the ability to infer observed conditions to the broader evaluation of MPA Network performance. When feasible, projects are encouraged to monitor sites from Tier II and Tier III lists. Sites not identified in Tier I still play a critical role in the functioning of the MPA Network, and if researchers want to focus on the importance of good design principles they should be the ones to identify which MPAs from Tiers II and III they would like to study to test the hypothesis.
58	2.3 Site selection general	How well do Tier 1 sites support research on Tier 1 species?	Comment noted. The Tier 1 species and species groups occur over a range of key habitats. The underlying assumption is the Tier 1 sites support habitats where Tier 1 species are found. The species list in the draft Action Plan are taken from the regional monitoring plans. These are species likely to benefit from MPA protection. These lists were vetted by the public and scientific community.
59	2.3 Site Selection MPA Design Features Methods	Please provide a reference for how minimum size was determined.	The minimum MPA size was determined by the MLPA Science Advisory Team during the planning process. This reference is included in Appendix F of the revised draft Action Plan.

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
60	2.3 Site Selection MPA Design Features Methods	Evaluation of Level of Protection (LOP) is unclear. Hard to understand how LOP activities in Table F2 correspond to low or high impact.	Each of the final LOPs for the four regions have a footnote added to the bottom of table F2 in the revised draft Action Plan Appendix F, shows the original source of where the LOP reference was obtained.
61	2.3 Site Selection MPA Design Features Methods	Can level of enforcement/compliance also be factored into MPA design features?	See comment 53. Since the MPAs were implemented at different times, and inconsistent reporting of MPA citations and violations occurring for many years, this is not a metric that can be added.
62	2.3 Site Selection MPA Design Features Methods	How would incorporating enforcement/compliance influence scoring and outcomes?	See comment 53.
63	2.3 Site Selection MPA Design Features Methods	Is there any justification for why four years equals historical?	Comment noted. Historical MPAs are any MPAs that existed prior to the MPA redesign process.
64	2.3 Site Selection MPA Design Features Methods	Why were sites not then ranked and final ranks averaged for this method as was done for each of the four methods overall? Not all criteria contribute equally with habitat and level of protection being the overwhelming contributors of points for this category.	Comment noted. All criteria are simplified into either meeting thresholds or not, and thus are then assigned a corresponding point value. If MPAs are ranked beforehand, based on a value ranging between 0-2 and then averaged to arrive at a final rank, many sites would end up with the same final ranking. While not all criteria contribute equally, all criteria are considered design criteria and are therefore weighted the same.
65	2.3 Site Selection Historical Monitoring Methods	Why not incorporate fisheries data? Undoubtedly there are long-term fishery datasets.	Comment noted. This is accounted for in local historical fishing effort through the California Recreational Fisheries Survey (CRFS) for the private/rental boat data. Unfortunately, the coarse scale of commercial fishing data prohibits a fine scale analysis of historical effort making it impossible to integrate in the same context as CRFS data. The private/rental boat data are at a scale resolution of one minute latitude by one minute longitude blocks. Also see response to Comment 54

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
66	2.3 Site Selection Historical Monitoring Methods	What datasets were identified but not included? Was the justification for exclusion logical? Hard to tell with documentation provided.	The draft Action Plan has been revised to clarify why, the programs currently found in section 2.2 “incorporating existing approaches” were considered but ultimately excluded. Limitations to data methods were also added (see comment 55).
67	2.3 Site Selection Historical Monitoring Methods	How would scoring change if estuarine monitoring had been included?	The draft Action Plan was revised to better describe why only one of the four quantitative methods could be applied to estuarine MPAs (see section 2.3 and Appendix F of the revised draft Action Plan).
68	2.3 Site Selection Historical Monitoring Methods	Estuarine results reported in main text as completed & reported separately in the Appendix, but these results do not actually appear in the Appendix.	Comment noted. Estuarine rankings do appear in Appendix F after all coastal MPA rankings. Estuaries are only ranked based on design criteria. Also see response to Comment 67.
69	2.3 Site Selection Historical Monitoring Methods	Bias towards older MPAs with pre-established monitoring programs. Do you want to encourage something else other than what’s already been done?	Comment noted. The draft Action Plan is a living document. By focusing on historical MPAs that have extensive data collection prior to MPAs implemented during the MLPA process will increase the likelihood of documenting changes overtime improves.
70	2.3 Site Selection Historical Monitoring Methods	Is it possible to incorporate a more nuanced evaluation of historical monitoring to consider data quality and extent as well as relevance of the species monitored (e.g., species score from Appendix G)? Length of record is already included via a weighting factor, so a long-term record on a minimally important species could bias the results.	Comment noted. One of the key benefits of the three monitoring programs used in this method is they collect data on a multitude of factors including invertebrates, algae, and fish species. Many of the species monitored by these programs are identified on the species likely to benefit lists within four Regional MPA Monitoring Plans (see response to Comment 58). They do not solely focus data collection on minimally important species, but easily identifiable and frequently fished species.
71	2.3 Site Selection Historical Monitoring Methods	What are unintended consequences of weighting MPAs based on where we have most long-term data; what is it we don’t know and how important is this?	Comment Noted. By focusing on MPAs that have extensive data sets beyond the years established by the MLPA, the likelihood of determining changes overtime improves.



Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
72	2.3 Site Selection ROMS Modeling Methods	This ROMS method has a high uncertainty. Should it be included or weighted the same as the others?	While there may be a certain degree of uncertainty with this method one of the key factors of the network is connectivity between MPAs and non-MPAs. The ROMS model is the only method we currently have that shows any sort of connectivity and spacing importance between areas within the Network; the ROMS model is the only available tool to estimate connectivity between MPAs.
73	2.3 Site Selection ROMS Modeling Methods	ROMS may be useful down the road, but not useful currently. The approach is based on assumptions and what we don't know about larval processes, fish behavior and oceanography.	All modeling is based on assumptions. This specific model does not identify a specific species for modeling but rather a larval duration of a specific time that may apply to a multitude of species. It averages oceanographic trends over a 15-year period. Next steps in refining the ROMS model for connectivity measurements include integrating ecological information, and the model will continue evolving.
74	2.3 Site Selection ROMS Modeling Methods	How was the starting number of larvae determined for each cell?	The draft Action Plan was revised to include more information in Appendix F to explain how the number was determined.
75	2.3 Site Selection ROMS Modeling Methods	How do these pelagic larval durations (PLDs) correlate to relative species of interest? Are they representative?	Comment noted. Thirty to 60 days is a PLD representative for most non-algal species (algae have propagules like spores as a dispersal stage) along the California coast." This is a statement taken directly from the current draft Action Plan Section 2.3, Method 3 and seemingly addresses the question posed.
76	2.3 Site Selection ROMS Modeling Methods	Are sources and sinks prioritized the same? Prioritizing a sink is contentious, especially if not well explained.	Comment noted. Yes, sources and sinks are prioritized the same, and this is stated in the draft Action Plan Section 2.3, Method 3. Because the model combines all habitat connectivity, inside and outside MPAs, we have a true sense of which areas are the most connected.

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
77	2.3 Site Selection ROMS Modeling Methods	How the ROMS model could, should, and is used to inform the site selection process appears to be unresolved. There are possibilities of what it could do listed, but it is unclear what values actually mean.	Comment noted. The statement in the draft Action Plan Section 2.3 Method 3, "Sites were ranked based on their level of larval connectivity to areas both inside and outside MPAs, prioritizing areas that are highly connected (both sources and sinks) across habitats" states specifically that the ROMS model is used to gauge which MPAs are more connected than others.
78	2.3 Site Selection ROMS Modeling Methods	How much does site selection change based on PLD duration? Is this accounted for in the values?	Comment noted. The PLD duration of 30-60 days encompasses many key indicator species along California's Coast. While the model can produce results for longer or shorter PLDs, this is not accounted for in the draft Action Plan.
79	2.3 Site Selection ROMS Modeling Methods	Are MPAs contributing seed material to the fishing grounds?	Comment noted. The model itself accounts for the simulated release of larvae from cells along California's coast both inside and outside MPAs. Since this is a simulated release it shows the general connectivity to both surround MPA and non-MPA cells. However, this model doesn't answer the question of spillover or seeding to the fishing ground in a specific way, and the text in Appendix F clarifies: "The ROMS output can be considered a measure of connectivity among cells (locations) but should not be considered an estimate of one cell's contribution of larvae (propagules) to other cells."
80	2.3 Site Selection ROMS Modeling Methods	Are the MPAs connected enough so that network is self-sustaining?	Comment noted. While the model predicts which cells within an MPA are connected to other MPAs, the Action Plan itself does not answer the question of "is the network self-sustaining" This is a question that could be addressed outside the context of the draft Action Plan.

Comment Number	Applicable Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE/ACTION
81	2.3 Site Selection ROMS Modeling Methods	Appropriate documentation of model results not provided in appendix	All raw data is excluded from the draft Action Plan for all site selection methods. See response to comment 52.
82	2.3 Site Selection Historical Fishing Effort Methods	Is focus on recreational data appropriate? Arguably, commercial fishing is a greater source of removals for many nearshore species on the north coast.	See comment 54 for text detailing this limitation. To summarize the coarse scale of commercial data makes it not possible to integrate in the same context as recreational data.
83	2.3 Site Selection Historical Fishing Effort Methods	Any evidence from historical data that historical MPAs are working?	Comment noted. Two papers (Caselle et al. 2015 and Starr et al. 2015) are cited in the first paragraph of the main body content describing this method.
84	2.3 Site Selection Historical Fishing Effort Methods	For impact studies, focus on private/rental and no analysis of CPFV particularly as onboard observe program includes spatial data	Comment noted. The analysis only focuses on private/rental boats because the data from that survey is one of a few that supports fine scale mapping of relative fishing effort. The CRFS private/rental boat data allow a resolution of one minute latitude by one minute longitude fishing blocks which is required in order to accurately pinpoint fishing inside/outside MPAs. CPFV observer data does also include high resolution positioning of sampled catch and effort, however, the data available at the time of analysis did not support standardizing relative effort across sites. Also, see response to comments 54 and 65 for text detailing this limitation.
85	2.3 Site Selection Historical Fishing Effort Methods	Were data filtered out that were 'bad' data? (e.g. locations reported in waters deeper than 200 m?)	Comment noted. There was data cleaning to ensure any invalid points that landed on land were removed from the data set. However, there was no filtering done by depth contours.
86	2.3 Site Selection Historical Fishing Effort Methods	Is this the place for enforcement or compliance data?	See comments 53 and 62 regarding enforcement data.
<b>Question 4: Are the species selected clear and well supported by the best available science?</b>			
87	2.3	Overall, the panel appreciated the semi-quantitative approach to scoring species but felt there was insufficient detail provided as to be able to fully evaluate the ranking approach to assess whether the selected species were selected based on the best available science.	The draft Action Plan species lists were revised to reflect a new approach to combine species lists by habitat into one master list, organize species by broad functional groups (invertebrates, fishes, marine plants and algae, and birds), and omit the tiered approach. The revisions better describe how these indicator species were identified (see section 2.3 and tables 7-10 of the draft Action Plan).

# Attachment 3

## MARINE PROTECTED AREA MONITORING ACTION PLAN

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### Summary of Public Comments Received and Responses

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Document prepared for  
California Fish and Game Commission Meeting  
October 17–18, 2018

September 21, 2018

# About this Document

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The *Marine Protected Area (MPA) Monitoring Action Plan*<sup>1</sup> (Action Plan) was developed by California Department of Fish and Wildlife (CDFW) in coordination with the Ocean Protection Council (OPC). Since February 2018, CDFW has regularly updated the California Fish and Game Commission (Commission), the Marine Resources Committee, and the Tribal Resources Committees about the draft Action Plan. CDFW sent notification letters to all federally recognized California Native American Tribes on February 27, 2018. The draft Action Plan was distributed to California Native American Tribes that requested it on July 9, 2018 and was made available to the public on July 16, 2018.

The draft Action Plan underwent a simultaneous public comment period and scientific peer review during July and August 2018 (see Attachment 2 for a summary of peer review comments received and responses<sup>2</sup>). The public comment period was open from July 16 – August 16, 2018. Seventeen public comment letters were received from a variety of stakeholders including commercial and recreational fisherman, scientists and non-governmental organizations.

The purpose of this document is to inform potential Commission discussion and action at their October 17-18, 2018 meeting in Fresno. The document summarizes all public comments received during the public comment period, and draft responses by CDFW in the revised draft Action Plan<sup>3</sup> (Table 1).

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<sup>1</sup> California Department of Fish and Wildlife. (2018). *Draft Marine Protected Area Monitoring Action Plan*. July 12, 2018.

<sup>2</sup> California Department of Fish and Wildlife. (2018). *Attachment 2: Summary of Peer Review Comments Received and Responses*. Document prepared for the California Fish and Game Commission meeting, October 17-18, 2018.

<sup>3</sup> California Department of Fish and Wildlife (2018). *Revised draft Marine Protected Area Monitoring Action Plan*. October 4, 2018.

Table 1. Public comments received by CDFW on the draft Action Plan during the public comment period from July 16, 2018 – August 16, 2018. The column on the far right (in green) shows how each comment was addressed.

Comment number & Date Received	Commenter, Organization	Applicable Comment Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE
1 (7/19/2018)	Russ Vetter, National Oceanic and Atmospheric Administration	General Comment	Surprised that CalCOFI and SCOOS sampling stations, and the links between MPA monitoring and Ocean Observing Systems are mostly ignored rather than expanded.	The importance of observations systems such as the California Cooperative Oceanic Fisheries Investigations <sup>4</sup> (CalCOFI) and the two California-based Integrated Ocean Observing System (IOOS) programs <sup>5,6</sup> was articulated in Box 2 of the draft Action Plan. In addition, Section 2.2 of the draft Action Plan was revised to include descriptions of CalCOFI and the two California IOOS programs as additional examples of programs that can contribute to long-term MPA monitoring in California.
2 (8/12/2018)	Brad Mongeau	General Comment	MPAs did nothing to address the live fish fishery, the most destructive fishery under CA governance. Mr. Mongeau indicated he has observed the harmful impacts of the fishery on the environment and rockfish populations. And, why was Begg Rock protected instead of the back side of Nicolas Island?	The draft Action Plan is intended to serve as a guide for long-term MPA monitoring across the state. Refer to CDFW (2016) <sup>7</sup> for a background on California's MPA design and siting process, including how MPAs and military safety zones were developed around the Channel Islands; and CDFW (2002) <sup>8</sup> for how species included in the live-fish fishery are managed.

<sup>4</sup> <http://calcofi.org/>

<sup>5</sup> <https://ioos.noaa.gov/regions/sccoos/>

<sup>6</sup> <https://ioos.noaa.gov/regions/cencoos/>

<sup>7</sup> California Department of Fish and Wildlife. 2016. California Marine Life Protection Act Master Plan for Marine Protected Areas. Adopted by the California Fish and Game Commission on August 24, 2016.

<sup>8</sup> California Department of Fish and Wildlife. 2002. Nearshore Fishery Management Plan. California Natural Resources Agency, California Department of Fish and Wildlife, Marine Region.

Comment number & Date Received	Commenter, Organization	Applicable Comment Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE
3 (8/13/2018)	Bruce Watkins	Section 2.3	Purple sea urchin population expansion has resulted in a decline in species diversity. Mr. Watkins suggests the MPA Management Program develop a sea urchin monitoring program to track restoration efforts a select areas.	Purple sea urchins ( <i>Strongylocentrotus purpuratus</i> ) continue to be actively monitored and are listed as an indicator species for long-term monitoring (see Table 8 of the revised draft Action Plan). Existing monitoring data may be explored by visiting the California Natural Resources Agency Open Data Platform (ODP). For example, results from monitoring purple sea urchins are summarized in a report that can be downloaded from the ODP at <a href="https://data.cnra.ca.gov/dataset/north-coast-state-of-the-region-snapshots-and-supplemental-reports-all-habitats-2013-to-2017/resource/ea06d72f-e2c7-4197-92f9-46b5b664bd9f">https://data.cnra.ca.gov/dataset/north-coast-state-of-the-region-snapshots-and-supplemental-reports-all-habitats-2013-to-2017/resource/ea06d72f-e2c7-4197-92f9-46b5b664bd9f</a> . Also see response to Comment 6.
4 (8/15/2018)	Angela Kemsley, WildCOAST	General Comment	Supports the Action Plan and commends the recognition of the importance of community (citizen) science efforts in MPA monitoring and its inclusion.	Support noted.
5 (8/15/2018)	Michael Warburton, Public Trust Alliance	General Comment	We are extremely pleased to see this comprehensive approach to protecting public resources in California's MPAs. Our organizational effort to encourage sustainable water resources management in a time of climate change has led to a concern about brine disposal along California's coast (particularly the discharges related to seawater desalination plants). We hope your long-term monitoring plans incorporate some enhanced attention to independent demonstration of the public necessity for such infrastructure before it is approved in any MPA. Thank you for your valuable work!	Support noted. Long-term monitoring and management of MPAs is informed by existing science and policy considerations. For example, Section 2.3 and Appendix B of the revised draft Action Plan identifies evaluation questions and indicators to help guide monitoring and adaptive management including how stressors such as desalination plants may impact MPA performance over time.



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6 (8/15/2018)	Keith Rootsart	General Comment	<p>The Action Plan is a cut and paste of previous action plan and does not reflect trends. Urchins and other environmental conditions such as the warm water blob caused an imbalance in marine life populations especially kelp ecosystems.</p> <p>Ties Goal 2 to "restore and rebuild" to restoration and argues that urchin barrens should be restored to a kelp forest ecology as documented in the baseline reports.</p> <p>I propose this MLPA Monitoring Action plan prioritize special monitoring and CDFW led actions to restore kelp forest ecosystems in the north and central coast back to their baselines, even in, and especially in, MPAs.</p>	<p>The draft Action Plan is intended to serve as a guide for long-term MPA monitoring across the state, including drawing from previous work (see Section 2.2 of the draft Action Plan). Phase 1 baseline MPA monitoring established a comprehensive benchmark of ecological and socioeconomic conditions at or near the time of MPA implementation across the state, including documenting unprecedented warm water conditions in recent years driven in part by the North Pacific Marine Heatwave, and other unexpected events such as the 2015-16 El Niño and Sea Star Wasting Syndrome. These types of large-scale events have led to cascading ecological changes such as significant increases of sea urchins and declines of sea stars and kelp. While researchers continue to examine how such events have shaped marine communities, these types of findings underscore the importance of collecting long-term data. Also see response to Comment 3.</p>

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7 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	General Comment	Urge you to explicitly consider adverse socio-economic impacts in the context of adaptive management by explicitly outlining how the plan could inform, among other fishing-related management measures, the "establishment, modification, or abolishment of existing MPAs or new MPAs" (FGC 2853(c)).	<p>While the MLPA does not require collection or analysis of socioeconomic information, California's MPA Network was designed with both ecological and socioeconomic concerns in mind (CDFW 2016, Appendix A).<sup>9</sup> In addition, phase 1 baseline MPA monitoring established a comprehensive benchmark of socioeconomic conditions at or near the time of MPA implementation across the state (see section 2.2 of the draft Action Plan).</p> <p>The draft Action Plan is intended to serve as a guide for long-term MPA monitoring across the state, including prioritizing human uses to target for long-term monitoring to inform the evaluation of California's MPA Network. For example, Section 2.3 of the draft Action Plan was revised to include additional key performance measures and metrics for human use monitoring. See Appendix D of the revised draft Action Plan for more detailed recommendations on human use monitoring.</p>
8 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	General Comment	Recommend the consultation of the California Fish and Game Commission Marine Resources Committee's Staff Report on California Fishing Communities Meetings when re-drafting the monitoring plan.	Comment noted.

<sup>9</sup> California Department of Fish and Wildlife. 2016. California Marine Life Protection Act Master Plan for Marine Protected Areas, *Appendix A: Marine Protected Area Planning through the Marine Life Protection Act Initiative*. Adopted by the California Fish and Game Commission on August 24, 2016.

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9 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	General Comment	We recommend the Department look to the MLMA, FGC (7055, 7056, 7059) to review the necessity to prioritize minimizing adverse impacts to fishing communities, responding quickly to environmental and socio-economic factors harming fishing as a livelihood, and communicating with fisheries stakeholders. These priorities should be reflected in the monitoring action and, and the plan should serve to enhance the objective of fisheries management as outlined in statute. It is imperative that the management plan including provisions that specifically enable DFW to minimize these impacts.	See response to Comment 7, and Appendix D of CDFW's 2018 Marine Life Management Act (MLMA) Master Plan <sup>10</sup> which provides an overview of California's MPAs and the various ways they can be used as a tool to meet management goals of the MLMA.
10 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	Section 2.3 and Appendix D	Urge you to revise the plan to include enhanced measure for socioeconomic impact analysis and the explicit consideration of modification of the boundaries of existing MPAs in response to sociological factors inherent to commercial fishing.	See response to Comment 7.
11 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	Executive Summary	The Executive Summary does not give the full MLPA definition of adaptive management as defined in FGC code Section 2852 and 2853. We suggest that the draft be updated to include the full definition of adaptive management.	The draft Action Plan includes the statutory definition of adaptive management in the Glossary.
12 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	General Comment	Urge you, in the spirit of the Master Plan design objectives, to revise the plan to feature consideration of fishing communities and the MPAs impacts to their wellbeing and livelihoods.	See response to Comment 7 and Comment 9.

<sup>10</sup> California Department of Fish and Wildlife. 2018. Master Plan for Fisheries: A Guide for Implementation of the Marine Life Management Act. Adopted by the California Fish and Game Commission on June 20, 2018.

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13 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	General Comment	We encourage DFW to use the large amounts of data available to them. We would like to see future monitoring assessments and socioeconomic analyses that do not exhibit bias, as the North Coast report does.	Section 2.3 and Appendix F of the draft Action Plan were revised to better describe how a relative index of recreational fishing pressure was developed at a spatial resolution appropriate for determining influence on MPAs (one-minute latitude by one-minute longitude). The spatial resolution for available commercial fishing effort or catch data is too coarse for an analogous analysis (ten-minutes latitude by ten-minutes longitude). Also see response to Comment 7.
14 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	General Comment	We recommend the inclusion of monitoring programs that use the experience and expertise of commercial fishermen as a fundamental baseline component.	As specific monitoring projects move forward, researchers may be able to include fishermen. For example, the California Collaborative Fisheries Research Program <sup>11</sup> includes local charter boat captains and fishermen to help inform and conduct surveys. Similarly, commercial vessels are often contracted for surveys deploying remotely operated vehicles. Also see response to Comment 7.
15 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	Section 2.3 and Appendix D	We recommend that CDFW revise the plan to include the use of the 'hundred penny method' studies, performed during the MPA scoping process, as an additional metric by which fisheries with poor geographic data (i.e., the majority of fisheries on which our members depend) can be more adequately represented and quantified. While exercises such as the 'hundred pennies' are very constructive suggestions, virtually all of the related socio-economic issues are the responsibility of the fisheries managers at CDFW, not the MPA program, and would be an enormous financial burden for the MPA program to develop these suggested systems.	See response to Comment 7.

<sup>11</sup> <https://www.mlml.calstate.edu/ccfrp/>

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16 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	Section 2.3 and Appendix D	We recommend using landings receipts other effort metrics to track how fishermen are adapting to changes caused by MPA implementation and environmental changes by shifting effort towards secondary fisheries.	CDFW and researchers will continue to use the best available science for monitoring human uses, including landings receipts data, to inform MPA monitoring and adaptive management. Also see response to Comment 7.
17 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	General Comment	We are concerned by the heavier focus on shallower ecosystems with less than 100 meters' depth.	While section 2.3 of the draft Action Plan describes how ecosystems deeper than 100 meters have traditionally been challenging to monitor due to both logistics and cost, CDFW and OPC held a series of deep water workshops in 2017 to explore the full range of sampling methods used, including developing consensus expert recommendations on metrics, sites, and indicator species to inform long-term monitoring (see Appendix E of the draft Action Plan). The draft Action Plan was revised to identify specific indicator species from these workshops (see Tables 7-8 of the revised draft Action Plan).
18 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	General Comment	We are concerned that fewer projects in deep water areas will limit the plan's efficacy and disagree with the fundamental assumptions limiting monitoring in these areas.	See response to Comment 17.
19 (8/16/2018)	Noah Oppenheim, Pacific Coast Federation of Fisherman's Association	Section 2.3, Appendix F	We encourage CDFW to fundamentally reevaluate the use of Method 4 to commercial fisheries in the monitoring plan and adaptive management approaches. A final plan with Method 4 in plan as outlined in the draft plan is unacceptable.	See response to Comment 13.

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20 (8/16/2018)	Katherine Pease, Heal the Bay	Section 2.3, Appendix F	Recommend including Point Vincente SMCA under Tier 1. We believe that Point Vincente SMCA represents a unique monitoring site with historical essential habitat (black abalone) and is important in terms of evaluating heavy human use and impacts on an MPA resilience to such impacts, and connectivity between MPAs of key species such as abalone, particularly when such species and associated ecosystems are increasingly being affected by climate and non-climate stressors.	The draft Action Plan was revised to better describe the criteria applied to determine site selection (see Section 2.3 and Appendix F of the revised Action Plan). Also see response to Comment 23.
21 (8/16/2018)	Anna Weinsten, Audubon California	Section 2.3, Appendix G	Include black oystercatcher as an indicator species for rocky intertidal reefs SMRs in Table G1, Appendix G (pg. 161). Include a link to the black oystercatcher program in the interactive dashboard (pg. 15) listing "who is monitoring what and where" on the coastline.	Black Oystercatcher ( <i>Haematopus bachmani</i> ) is identified as an indicator bird species for long-term monitoring (see Table 10 of the revised Action Plan).
22 (8/16/2018)	Anna Weinsten, Audubon California	Section 2.2	Include a link to the black oystercatcher program in the interactive dashboard listing "who is monitoring what and where" on the coastline.	See response to Comment 21.
23 (8/16/2018)	Lauren Garske-Garcia, California Coastal Commission	Section 2.3, Appendix F	Helpful to provide some level of guidance for the use of opportunistic funds and their application to Tier 2 and Tier 3 items. We observe that there may be a necessary trade-off between application of such funds to increase the level of effort applied to Tier 2 priorities and the decision to apply any limited funds to Tier 3 priorities. It may be worth discussing the relationship between the goal for consistency and expanse in Tier 2 efforts versus minimum targets for the occurrence of Tier 3 efforts.	Section 2.3 of the draft Action Plan describes that state-funded long-term monitoring projects should prioritize the Tier I index sites that align with monitoring project methods. Tier I sites should provide the ability to infer observed conditions to the broader evaluation of MPA Network performance. When feasible, projects are encouraged to monitor sites from Tier II and Tier III lists. Sites not identified in Tier I still play a critical role in the functioning of the MPA Network. See Section 2.3 and Appendix F of the revised draft Action Plan.

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24 (8/16/2018)	Lauren Garske-Garcia, California Coastal Commission	Section 2.3	Coastal adaptation measures should be added, as this is an issue that will only become increasingly important in the face of sea level rise. Specifically, we anticipate that the use of both hard and soft solutions shoreline protective devices such as seawalls and revetments, and beach replenishment programs, respectively—will become more frequent and alter the nature of California's shorelines, including in areas adjacent to MPAs. Managed retreat may also occur in some coastal areas, and changes in land use and development patterns will also foreseeably occur into the future. The Coastal Commission can serve as a partner with respect to planning and regulation of these aspects, including through permit conditions that require marine habitat monitoring and mitigation for any adverse impacts.	The draft Action Plan is intended to serve as a guide for long-term MPA monitoring across the state. MPA monitoring and management in California is rooted in a partnership-based approach to facilitate the design, implementation, and adaptive management of the MPA Network (see Section 1.2 of the revised Action Plan, OPC (2014) <sup>12</sup> , and CDFW (2016)). For example, California's Statewide MPA Leadership Team <sup>13</sup> (Leadership Team) encourages effective communication and collaboration among partners, including CDFW, OPC, State Lands Commission, and the California Coastal Commission; that have regulatory authority, responsibility, or interests related to the MPA Network (see Section 1.2 of the revised draft Action Plan). CDFW, and other Leadership Team entities, can coordinate with the California Coastal Commission for ongoing and emerging issues such as impacts from sea level rise and climate change influence specific management measures, and leverage partnerships to fully explore monitoring and mitigation measures associated with these impacts.
25 (8/16/2018)	Lauren Garske-Garcia, California Coastal Commission	Section 2.3	Both categories include biotic components though the items are organized under Abiotic Factors. While we understand the intent is to recognize the physical contributions of macroalgal cover and benthic communities to the ecosystem, it would be helpful to elaborate or clarify this point with more specific citation of shading, nutrient input, bioturbation, etc.	Comment noted.

<sup>12</sup> California Ocean Protection Council. 2014. The California Collaborative Approach: Marine Protected Areas Partnership Plan.

<sup>13</sup> <http://www.opc.ca.gov/programs-summary/marine-protected-areas/partnerships/>



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26 (8/16/2018)	Lauren Garske-Garcia, California Coastal Commission	Section 2.3, Appendix G	We strongly recommend that climate change vulnerability also incorporate the issue of coastal squeeze and the effects of shoreline armoring, coastal erosion, and sea level rise. Intertidal habitats will be particularly vulnerable to loss under future climate scenarios, including due to drowning and physical substrate loss. Beach replenishment will also likely have important consequences for beach communities as well as adjacent rocky habitats (e.g., burial and scour, whether episodic or ongoing) and should be considered in species evaluations.	See response to Comment 24.
27 (8/16/2018)	Lauren Garske-Garcia, California Coastal Commission	Section 2.3, Appendix G	While the narrative text indicates that these are prioritized as Tier 1 species for monitoring, regardless of their score, two species marked with an asterisk in Table 6, indicating their status as listed, are placed at the end of Tier 2. This inconsistency should be corrected for <i>Cryptochiton stelleri</i> and <i>Katharina tunicata</i> .	The draft Action Plan was revised to better describe how indicator species are identified (see Section 2.3 and Tables 7-10 of the revised draft Action Plan).
28 (8/16/2018)	Lauren Garske-Garcia, California Coastal Commission	Section 2.3	We encourage recognition of the Coastal Commission as a partner in efforts to manage marine invasive species. In the past, we have assisted in addressing <i>Caulerpa taxifolia</i> invasions in coastal waters through inclusion of Special Condition language in relevant Coastal Development Permits, requiring pre-construction surveys and reporting to facilitate the identification and control of <i>Caulerpa</i> occurrences. We can also, and are beginning to, incorporate monitoring for <i>Undaria pinnatifida</i> and <i>Sargassum horneri</i> in relevant permits, and may consider activities such as their removal from sites (under strict guidelines) for marine habitat mitigation in the future.	The draft Action Plan was revised to include specifically identify the California Coastal Commission as a key agency to collaborate with regarding opportunities to link MPAs and marine invasive species management (see Section 2.3 of the revised Action Plan). Also see response to Comment 24.

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29 (8/16/2018)	Lauren Garske-Garcia, California Coastal Commission	General Comment	The Coastal Commission can take action through the support of local policies and use of permit conditions to avoid and minimize lighting impacts in areas adjacent to MPAs.	See response to Comment 24.
30 (8/16/2018)	Tommy Swearingen	Appendix D	While the improvements in fisheries monitoring advocated by EcoTrust are very constructive suggestions, virtually all of those improvements are the responsibility of the fisheries managers at CDFW, not the MPA Program. It would be an enormous financial burden for the MPA program to develop these suggested systems.	See response to Comment 7.
31 (8/16/2018)	Tommy Swearingen	Appendix D	Over time, effort shifts among the vulnerable fisheries will become evident in the pre-existing fisheries data collection efforts of CDFW. Refinement of spatial resolution within these reporting procedures is certainly desirable. Due to the dependence of existing efforts on self-reporting, however, GPS based systems are even more desirable. Again, this is an issue for fisheries management, regardless of the MPA monitoring.	See response to Comment 7, Comment 13, and Comment 16.
32 (8/16/2018)	Tommy Swearingen	Appendix D	In the absence of either of the above, there are still reasonably accurate methods for disaggregated existing fisheries data based on fisheries independent research, species/habitat associations, and benthic mapping. These methods could allow prompt implementation. They are useful for estimating potential impacts (potential displacement) based on historic patterns. They do not allow dynamic behavioral estimation of effort shift responses.	See response to Comment 7.

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33 (8/16/2018)	Tommy Swearingen	Appendix D	The finest level of spatial resolution of the IMPLAN model is the county level. This may or may not be an appropriate unit of analysis, depending on the county and ports involved.	See response to Comment 7.
34 (8/16/2018)	Tommy Swearingen	Appendix D	A key consideration in estimation of the regional economic impacts of fisheries is the structure of the fishing industry employment. IMPLAN tends to underestimate fisheries employment and resulting local economic impacts because the model estimates are based on formal reported sectoral employment (i.e., individuals reported as employees, subject to unemployment taxes, etc.) The fisheries industry is characterized by a very high proportion of contract employees that are often overlooked in sectoral employment data. Depending on the location and fishery business structure, the IMPLAN underestimates can be quite significant. Adjustments in employment estimates such as those derived from the IMPLAN derivative model, FEAM, are indicated to accurately reflect the regional economic impacts of fisheries.	See response to Comment 7 and Comment 33.

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35 (8/16/2018)	Tommy Swearingen	Appendix D	The strong emphasis of the proposed data collection efforts specifically on impacts among the fishing occupational communities ignores the interests of many other stakeholders in the geographic coastal communities. There are winners and losers related to any policy, even in relatively small and rural communities. None of these coastal county economies are specifically dependent on the fishing economic sector.	See response to Comment 7.
36 (8/16/2018)	Tommy Swearingen	Appendix D	Quantitative studies are the emphasis of most of the proposed research. Impacts may not be evident in primary or secondary aggregated quantitative data. Explication of qualitative approaches to address this potential (or even probable) concern is insufficient.	See response to Comment 7.
37 (8/16/2018)	Tommy Swearingen	Appendix D	Much of the visitation data relating to tourism and recreation trends are already collected under the CA Department of Parks and Recreation Statewide Comprehensive Outdoor Recreation Plan and related agency studies, and for the CA Office of Tourism, under contract by Dean Runyan Associates, to assess the economic impacts of tourism. Much of these data typically can be disaggregated to the county level. Collection of such primary data would be redundant and expensive.	See response to Comment 7.

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38 (8/16/2018)	Tommy Swearingen	Appendix D	A particularly important consideration that the agency can monitor more immediately is awareness of the MPA system and the importance of the presence of the MPAs in trip decision motives. Characterization of visitors' activities and collection of expenditures data for travel cost method (TCM) analyses are important for baseline comparative purposes. However, change in such activities and expenditures cannot be directly related to the MPA system until the presence of the MPA system impacts trip motives. In the absence of data documenting either (1) an awareness that the visitors are at an MPA, or (2) awareness of a CA MPA system, and (3) the degree of influence that the presence of or visit to the MPA system had on trip decisions, the economic impact of the MPA system among tourists and recreationists is zero. The specific variables are MPA awareness and [proportional] attribution of trip decision motives.	See response to Comment 7.
39 (8/16/2018)	Tommy Swearingen	Appendix D	The agency could pursue a state-wide survey of attitudes, perceptions, and support for MPAs. This is important baseline information. All state residents are ultimately important stakeholders.	See response to Comment 7.

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40 (8/16/2018)	Tommy Swearingen	Appendix D	The use of citizen science to collect pressure count data and intercept surveys would be useful to establish a site-specific baseline of visitor activities, but only to the extent that a reasonably accurate random sample is assured. That can prove difficult using volunteers, so some accommodation to assure representativeness (external validity) of the sample regardless of the consistency of volunteers' efforts should be addressed.	Comment noted.
41 (8/16/2018)	Tommy Swearingen	Appendix D	The participatory GIS studies of place attachment and identity are constructive efforts to assess motives for coastal visitation. Again, relating this data specifically to MPAs is only indirectly implied by such data without specific attention to awareness and attribution.	Comment noted.
42 (8/16/2018)	Tommy Swearingen	Appendix D	The use of hedonic price methods in real estate markets related to the presence of MPAs is almost certainly premature. However, there are related coastal studies already in progress.	See response to Comment 7.

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43 (8/16/2018)	Tommy Swearingen	Appendix D	Comparison group evaluations based on MPA proximity among coastal communities and/or stakeholders (e.g. subsamples assigned by fisheries) are constructive. However, there are other useful criteria for comparative community case study selection including community social welfare/vulnerability, fisheries engagement, fisheries dependence, coastal regions, and coastal region/state comparative criteria. Such comparisons are primarily or exclusively dependent on readily available secondary data that can be obtained online and/or from NOAA. These are probably among the most important time series analyses proposed in the entire Appendix D. They belong in Tier 1.	See response to Comment 7.
44 (8/16/2018)	Tommy Swearingen	Appendix D	Tier 3 does not appear to be a discrete set of proposals so much as a methodological discussion	See response to Comment 23.
45 (8/16/2018)	Tommy Swearingen	Appendix D	Prioritization of proposed data collection within each tier across all three tiers is lacking.	See response to Comment 23.



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46 (8/16/2018)	Tommy Swearingen	Appendix B, D	The relationship between almost any of the proposals in Appendix D and the specific measurable research question in Appendix B is unclear.	Section 2.3 of the draft Action Plan was revised to better describe the purpose and utility of the broad list of evaluation questions found in Appendix B, including examples of a sub-set of these evaluation questions. Evaluation questions provide a contextual framework for key measures and metrics, such as key human use measures and metrics identified from Appendix D (see section 2.3 of the revised Action Plan). Also see response to Comment 5.
47 (8/16/2018)	Rikki Eriksen, California Marine Sanctuary Foundation	General Comment	Thanks CDFW and OPC for a high-quality and thoughtful monitoring plan.	Support noted.
48 (8/16/2018)	Ashley Eagle-Gibbs, Environmental Action Committee of West Marin	General Comment	Strong support of the Action Plan and the launch of Phase II.	Support noted.
49 (8/16/2018)	Ashley Eagle-Gibbs, Environmental Action Committee of West Marin	Section 2.3	Recommend adding in the role of MPA enforcement and compliance data as key metrics to understanding compliance trends to better understand MPA effectiveness.	Section 2.3 of the draft Action Plan was revised to include a specific example of an evaluation question regarding the importance of tracking compliance over time (see Section 2.3 of the revised draft Action Plan, and also see response to Comment 46). In addition, specific enforcement key performance measures and metrics were added (see Section 2.3 of the revised draft Action Plan).

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50 (8/16/2018)	Ashley Eagle-Gibbs, Environmental Action Committee of West Marin	Section 2.3, Appendix F	Recommend that the Action Plan clarify the tiers (tiers I, II, and III) do not necessarily indicate MPA importance or ecological value of each.	See response to Comment 23.
51 (8/16/2018)	Clarissa Anderson, Southern California Coastal Ocean Observing System	General Comment	We think this is a well-written Action Plan and summary, we appreciate that you highlight and reference functional diversity as one of the key performance metrics.	Support noted.
52 (8/16/2018)	Clarissa Anderson, Southern California Coastal Ocean Observing System	Section 2.3, Appendix G	For OA these include pteropods (pelagic) and echinoderms (benthic and pelagic life stages). For DO these include anchovy and an average fish case (pelagic) for and a crustacean and/or demersal fish. Also reference CTAG-OAH meeting summary for more information on this OPC-funded project.	Comment noted. The revised species lists in the draft Action Plan include a broad range of indicator species to prioritize for long term monitoring, including many that may be sensitive to ocean acidification and dissolved oxygen. The draft Action Plan highlight's CDFW's commitment to collaborating with other monitoring groups that target climate change related questions (See section 2.3, subsection "Other Species Special Interests."
53 (8/16/2018)	Clarissa Anderson, Southern California Coastal Ocean Observing System	General Comment	We noted a limited reference to the need for water quality measurements or assessment and no reference to the effect that harmful algal blooms might have on assessing MPA status and/or impacts from extreme events.	The draft Action Plan was revised to include a footnote to the Chemical metrics and measures that refers to other monitoring plans that focus on water quality issues in section 2.3.

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54 (8/16/2018)	Clarissa Anderson, Southern California Coastal Ocean Observing System	General Comment	We suggest adding water quality to Statewide Long-Term Monitoring (page 13) and that some mention of SCCOOS (and the other West Coast ocean observing systems) would be important here given our focus on nearshore, sustained, and real-time water quality measurements.	See response to Comment 1.
55 (8/16/2018)	Clarissa Anderson, Southern California Coastal Ocean Observing System	Section 2.2	We think you should list the CalCOFI program in "Examples of Important Existing Programs" page 15 even if you are not targeting a comprehensive list. Given the focus on fisheries and ichthyoplankton collection over many decades, this seems like a critical time series.	See response to Comment 1.
56 (8/16/2018)	Clarissa Anderson, Southern California Coastal Ocean Observing System	Section 2.3, Appendix G	We suggest that the Indicator Species listed on page 32 should include the CTAG-OAH list of species most vulnerable to OA and DO... or perhaps list them under "Species of Special Interest" on page 39.	See response to comment 52.
57 (8/16/2018)	Jennifer Savage, Surfrider Foundation, on behalf of non-governmental organization consortium	Section 2.3, Appendix F	Recommend including clarification that the tier system is to prioritize monitoring efforts only and is not an expression of value or importance of any particular MPA.	See response to Comment 23.

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58 (8/16/2018)	Jennifer Savage, Surfrider Foundation, on behalf of non-governmental organization consortium	General Comment	Recommend including the role of socioeconomic dimensions as part of long-term monitoring of MPAs and as part of understanding MPA network effectiveness.	See response to Comment 7.
59 (8/16/2018)	Jennifer Savage, Surfrider Foundation, on behalf of non-governmental organization consortium	General Comment, Appendix D	Recommend including the metrics and methods for long-term socioeconomic monitoring identified in Appendix D to be included in the main body of the Action Plan.	See responses to Comment 7 and Comment 46.
60 (8/16/2018)	Jennifer Savage, Surfrider Foundation, on behalf of non-governmental organization consortium	Section 2.3	Recommend including MPA enforcement and compliance data as key metrics to understanding trends in compliance and understanding MPA effectiveness.	See response to Comment 49.
61 (8/16/2018)	Jennifer Savage, Surfrider Foundation, on behalf of non-governmental organization consortium	General Comment	Recommend including area of interest for emerging socioeconomic research and development	See response to Comment 7.

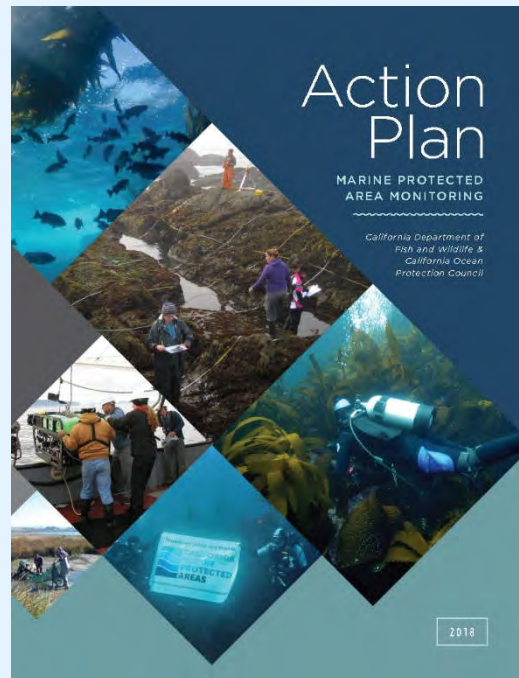
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62 (8/16/2018)	Irina Irvine, National Park Service	Section 2.2	Suggest revised text "Channel Islands National Park established the Kelp Forest Monitoring Program (KFMP) program in 1982 to collect baseline data on the Park's kelp forest ecosystems. The protocol was formally adopted in 1987 and two formal reviews and revisions of monitoring protocol have occurred since. All revisions made to the protocol since were thoughtfully made to not upset the long-term continuity of the data set. This is now one of the longest continuous datasets on the nearshore ecosystem in California and provides a baseline of data to compare against for context. This is extremely important as it relates to MPAs because this data set provides the baseline data prior to their establishment of MPAs at the Northern Channel Islands. Each year KFMP divers collect size and abundance data for algae, invertebrates, and fish along permanent transects. Currently, 33 sites are surveyed annually, including 15 sites within the Northern Channel Islands MPAs established in 2003. These MPAs sites are paired up with directly adjacent sites for MPA evaluation. Information from the KFM program has been used alongside PISCO data to detect changes in size and density of fishes, invertebrates and algae in response to MPAs."	Section 2.2 of the draft Action Plan was revised to incorporate these proposed text revisions, including a few edits for length and minor word changes.

Comment number & Date Received	Commenter, Organization	Applicable Comment Section, or General Comment	COMMENT SUMMARY	DRAFT RESPONSE
63 (8/16/2018)	Irina Irvine, National Park Service	Section 2.3, Appendix F	Method 2 Historical MPA, nearshore subtidal kelp forest monitoring- Channel Islands National Park has one of the longest continuous data sets (over 30 years) in California for kelp forest monitoring. The data comprise about half of that stored in the MARINe database. Though local, these data could be used as representative of Southern California.	The length of this particular time-series of data collected by the National Park Service Kelp Forest Monitoring Program <sup>14</sup> (KFMP) is impressive, and the potential importance of KFMP data for future analyses is noted in section 2.3 of the revised draft Action Plan. However it is important to point out that the MPA historical monitoring method (Method 2 of Index Site Selection described in Section 2.3 of the revised Action Plan) relies on an assessment of statewide monitoring that occurred consistently before and after MPA implementation.
64 (8/16/2018)	Irina Irvine, National Park Service	Section 2.3	pg. 29 paragraph 2 data that support compatibility..." (data are plural).	Grammatical corrections were an area of focus of review for the draft Action Plan. See Table 2.
65 (8/16/2018)	Irina Irvine, National Park Service	Section 2.3	Physical and Chemical oceanography (page 30) - is pH one of the metrics? Probably should be or a brief description of why it isn't and where it is addressed elsewhere.	The draft Action Plan included pH as a key chemical performance metric (see section 2.3 of the draft Action Plan), and a description of pH in the Glossary. The importance of pH as an indicator is also addressed with respect to California's estuarine MPAs (see section 2.3 of the revised draft Action Plan, and Appendix C).
66 (8/16/2018)	Irina Irvine, National Park Service	General Comment	Throughout the document - all the e.g. and i.e. need commas after the last period (e.g., and i.e.,).	See response to Comment 64.
67 (8/17/2018)	Gerald Kos	General Comment	Open Crystal Coast for take of rock scallops due to overabundance	Comment noted, but it is outside the scope of the draft Action Plan. However, a petition for regulatory change can be submitted to the Fish and Game Commission.
68 (8/16/2018)	Rick Gerlack	General Comment	Overregulation and frustration. Retiring from diving and supporting the local coastal economy.	Comment noted.

<sup>14</sup> <https://science.nature.nps.gov/im/units/medn/monitor/kelpforest.cfm>



# Marine Protected Area Monitoring Action Plan



## California Fish and Game Commission Meeting

October 17, 2018 • Fresno, CA

California Department of Fish and Wildlife



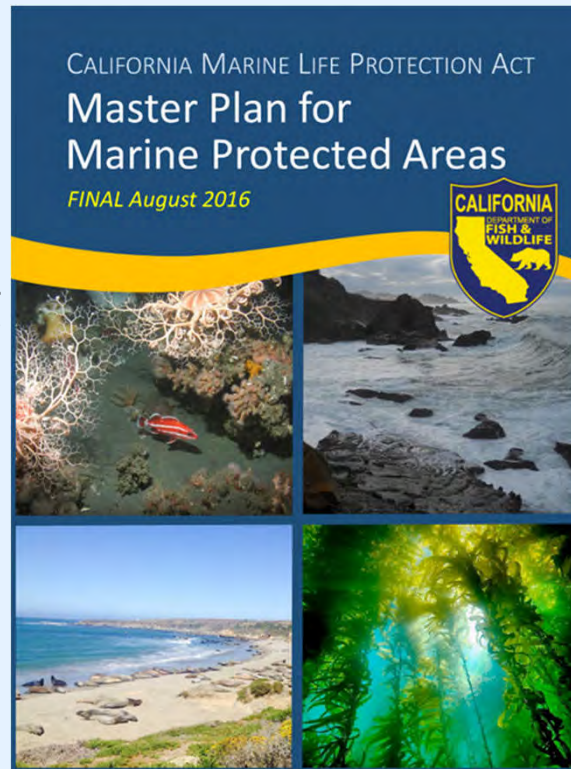
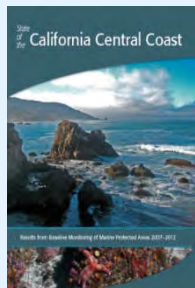


# Statewide MPA Monitoring Program

## Two-phase Approach

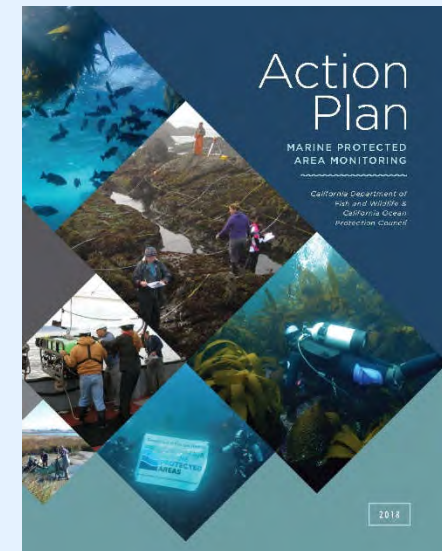
### Phase 1

- Baseline monitoring completed



### Phase 2

- Long-term monitoring in progress





# Purpose and Objectives

- Requirement to monitor, research, and evaluate at select sites
- Build from design process and baseline monitoring
- Incorporate quantitative and expert informed approaches





# Key Components

- Priority metrics to assess MPA performance
  - Species metrics
  - Community level metrics
  - Chemical and physical metrics
  - Human use metrics
- Tiered monitoring sites and species indicators
  - Index site selection
  - Indicator species selection

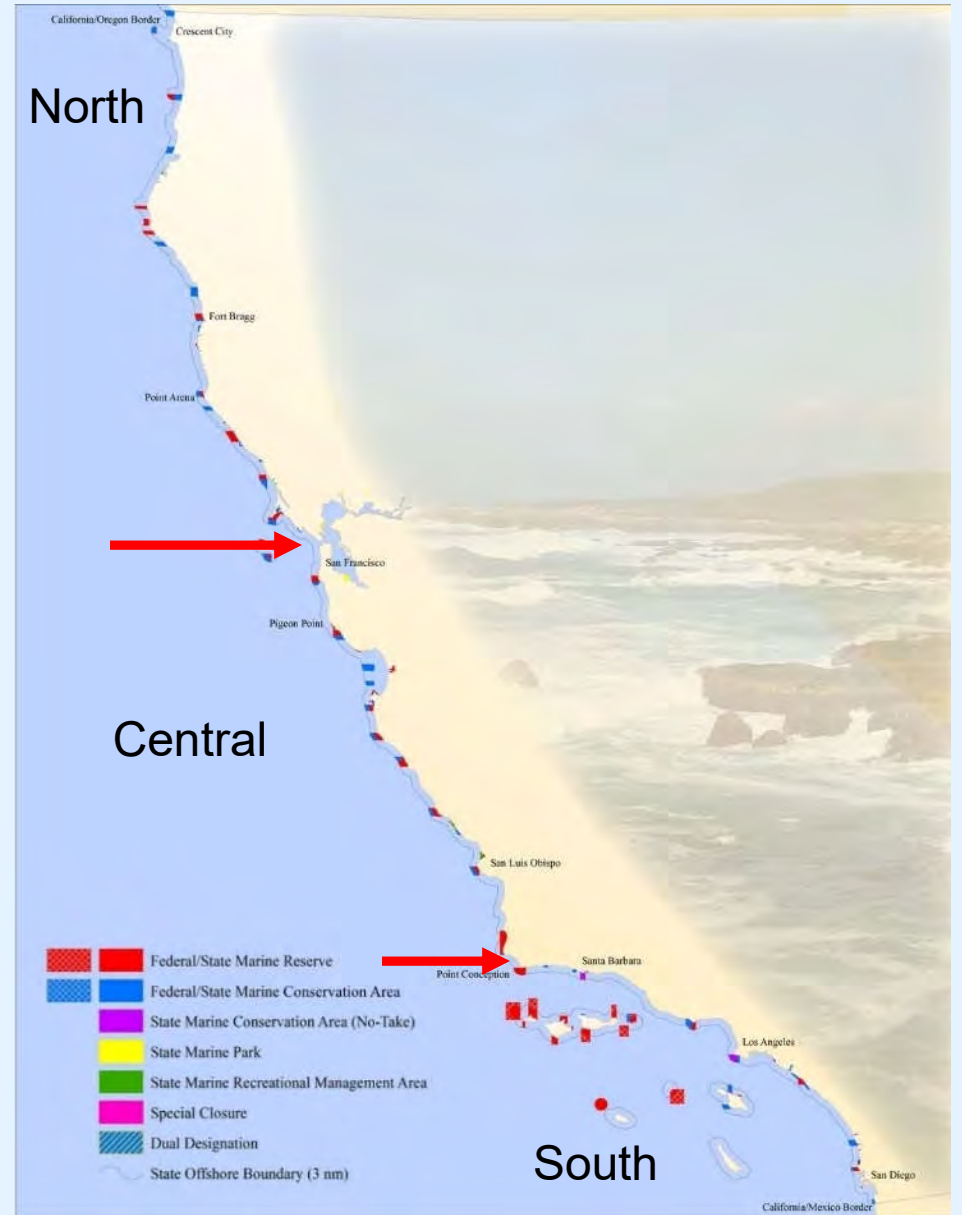






# Key Components: Site Selection

- MPA design features
- Historical monitoring programs
- Connectivity matrix modeling
- Local historical fishing pressure





# Key Components: Indicator Species



Regional monitoring plans



Deep water workshops



MLMA recommendations



Special status species



# Key Components: Tiered Approach

- Long-term monitoring projects should:
  - Prioritize Tier I index sites and indicator species
  - Monitor Tier II and III when appropriate
- Efficient data collection, broad evaluation of Network performance







# Key Components, continued

- Incorporate Traditional Ecological Knowledge
- Leverage other existing monitoring programs and approaches
- Apply novel, emerging quantitative analyses







# Timeline

- **February 27:** notified California Native American Tribes
- **February - August:** update the MRC, TC, and FGC
- **July 9 - August 7:** peer review panel convened
- **July 9 - August 16:** California Native American Tribe review
- **July 16 - August 16:** public comment period
- **August 28:** peer review panel final recommendations
- **October 2018:** potential FGC and OPC approval



# Peer Review Summary

- Recommended clarifications:
  - Measures and metrics
  - Multiple habitats represented in Tier I sites
  - Limitations of site selection criteria
  - Support for prioritizing rocky reef habitat
- Highlight socioeconomic monitoring recommendations
- Ensure open calls support monitoring of lower tiers and novel pilot studies





# Public Comment Summary

- Support monitoring for:
  - Changing ocean conditions
  - Robust socioeconomic metrics
  - Enforcement
  - Water quality
- Identify key outside long-term monitoring programs
- Include non-Tier I species and sites
- Remove MPAs







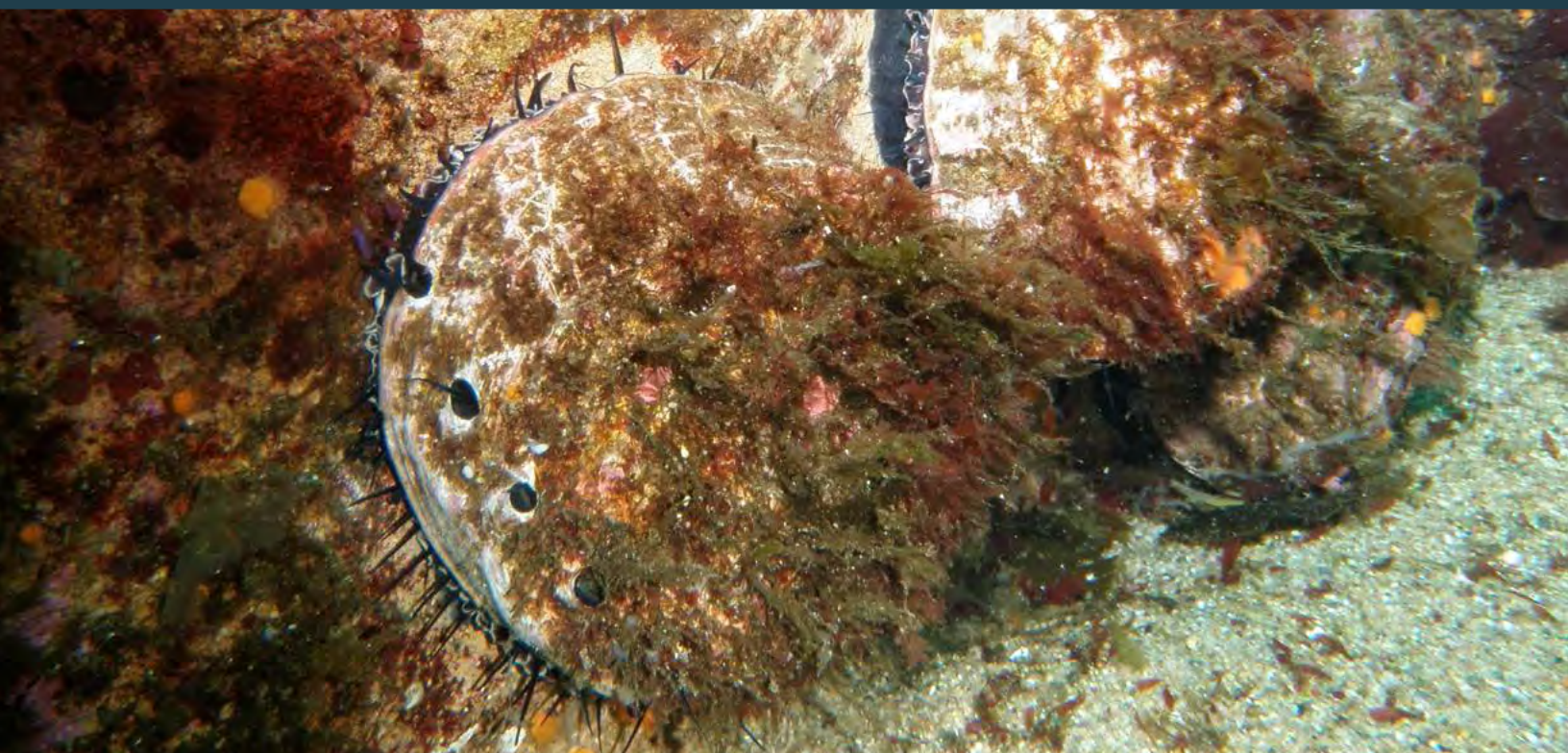
# Questions?



[www.wildlife.ca.gov/Conservation/Marine/MPAs](http://www.wildlife.ca.gov/Conservation/Marine/MPAs)

Final Report of the Scientific and Technical Review Panel

# Scientific Peer Review of Proposed Recreational Red Abalone Management Strategies



*Convened by the California Ocean Science Trust*

*Supported by the California Ocean Protection Council*

October 2018





# Review Participants

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## CALIFORNIA OCEAN SCIENCE TRUST

California Ocean Science Trust is a boundary organization. We work across traditional boundaries, bringing together governments, scientists, and citizens to build trust and understanding in ocean and coastal science. We are an independent non-profit organization established by the California Ocean Resources Stewardship Act (CORSAs) of 2000 to support managers and policymakers on the U.S. West Coast with sound science, and empower participation in the decisions that are shaping the future of our oceans. For more information, visit our website at [www.oceansciencetrust.org](http://www.oceansciencetrust.org).

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**Dr. Jason Cope (co-chair)**

Research Fish Biologist, Northwest Fisheries Science Center, NOAA Fisheries

**Dr. Peter Raimondi (co-chair)**

Professor, Department of Ecology and Evolutionary Biology, University of California, Santa Cruz

**Dr. Gavin Fay**

Assistant Professor, School for Marine Science and Technology, University of Massachusetts, Dartmouth

**Dr. Yan Jiao**

Professor, Department of Fish and Wildlife Conservation, Virginia Polytechnic Institute and State University

**Dr. Karina Nielsen**

Professor, Director of the Estuary and Ocean Science Center, San Francisco State University; Ocean Protection Council Science Advisory Team

**Dr. Brian Tissot**

Professor, Director of Humboldt Marine and Coastal Science Institute, Humboldt State University

**Dr. Will White**

Assistant Professor, Department of Fisheries and Wildlife, Oregon State University

# Review Participants continued

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## CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

The mission of the California Department of Fish and Wildlife is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.

California Department of Fish and Wildlife (CDFW) staff developed a draft FMP including a proposed management strategy that was included within this peer review scope. CDFW staff were engaged throughout the review process. They delivered presentations to the review panel and supplied additional data, information, and feedback to Ocean Science Trust as necessary throughout the review process.

Sonke Mastrup, Program Manager, California Department of Fish and Wildlife, was the primary management contact for this review.

## THE NATURE CONSERVANCY- LED STAKEHOLDER TEAM

The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends. Its vision is a world where the diversity of life thrives, and people act to conserve nature for its own sake and its ability to fulfill our needs and enrich our lives.

The Nature Conservancy (TNC) led a collaborative stakeholder team comprised of TNC staff, academic researchers, and recreational divers that developed an alternative management strategy that was included within the review scope. This team was engaged throughout the review process. The team delivered presentations to the review panel and supplied additional data, information, and feedback to Ocean Science Trust as necessary throughout the review process.

Dr. Alexis Jackson, Fisheries Project Director, The Nature Conservancy, was the primary contact for this review.





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**Recommended citation** Cope, J., Raimondi, P., Fay, G., Jiao, Y., Nielsen, K., Tissot, B., and White, W. Final report of the scientific and technical review panel: Scientific peer review of proposed recreational red abalone management strategies. California Ocean Science Trust, Oakland, CA. October, 2018.

**Image credits:** Scott Owens (cover); Chris Teague (p. 3); Jessica Williams (back cover)

## Background

In 2005, the Fish and Game Commission (FGC) adopted the Abalone Recovery and Management Plan (ARMP), which governs the management of the recreational red abalone fishery and recovery of southern abalone stocks. The ARMP has two phases of adaptive management: the interim management plan which the fishery is currently managed under, and the long-term management plan. Management changes to the fishery in 2014 marked the beginning of this move to long term management by setting regulations separately for the southern and northern areas of the fishery. The transition to ARMP long-term management provides an opportunity for the California Department of Fish and Wildlife (CDFW) to move management of the recreational red abalone fishery to a fishery management plan (FMP) under the Marine Life Management Act (MLMA).

Thus, it is important for the scientific underpinnings of the draft FMP to undergo external, independent peer review prior to submission to the FGC. This process is one way to provide FGC and stakeholders assurances that FMPs are based upon the best readily available scientific information, as set forth under the MLMA. CDFW drafted an FMP and a proposed management strategy as a part of that plan. The Nature Conservancy (TNC) led a stakeholder proposed management strategy as well. The FGC and CDFW have asked for both the management strategy proposed by CDFW and the stakeholder submitted management strategy, led by TNC, to be included in the peer review. Each of the groups have provided an independently developed management strategy for consideration.

## Review Scope

CDFW and FGC's purpose in asking Ocean Science Trust (OST) to conduct a review of the scientific and technical components of both the CDFW and the TNC management strategies to ensure the scientific and technical elements provide a rigorous underpinning for management decisions and regulatory action should they be implemented. Given the unusual circumstance of two proposed management strategies, CDFW sought review input that could illuminate the strengths and weaknesses of each approach to guide next steps. OST is serving as the review coordinating body, and worked with CDFW and TNC to develop a scope of review that focuses on key scientific and technical components of the management strategies where independent scientific assessment would add value.

The central question of this review is:

*Are the underlying data and analysis, and application of those in each of the proposed management strategies scientifically sound, reasonable, and appropriate, while also meeting the management goals for the recreational red abalone fishery in northern California as defined by MLMA?*

The review will focus on evaluation of the following components of both management strategies:

- Evaluation of the data collection methods that inform management indicators, triggers, and decisions including informing responses to changes in the environment, fishing, or other stressors.
- The scientific rationale for the indicators used and their link to anticipated responses in the abalone population and management decisions.
- The scientific rigor of the proposed quantitative analysis and application of the data and the robustness of the scientific rationale for the proposed management actions it triggers.
- Evaluation of modelling approaches used including model assumptions, analyses, interpretation, and application of the model results to evaluate performance of the harvest control rules against management objectives.
- A general scientific assessment of the proposed methods including application, assumptions, and management implications of uncertainties in the stock status, data streams, and analytical methods within the confines of CDFW capacity and regulatory authority.

For clarity we note that this is not a comprehensive review of the entire FMP. Rather, we are reviewing only the management strategies submitted by TNC and by CDFW. The more detailed reviewer instructions are available online [here](#).

## Summary of the Review Process

This review took place from May 2018 - October 2018. Ocean Science Trust implemented a scientific review process that sought to promote objectivity, transparency, candor, efficiency, and scientific rigor. Following a broad solicitation of potential reviewers (coordinated via the Ocean Protection Council Science Advisory Team), a multidisciplinary, seven-member review panel was assembled, representing expertise in fisheries science and management, abalone ecology, and modeling, among other subjects. OST facilitated constructive interactions between reviewers and both author teams through a series of remote meetings, where CDFW and the TNC-led stakeholder teams presented an overview of the science and technical elements under review, and were available to answer reviewers' questions. In addition, OST convened reviewers independently to allow the review panel to candidly discuss the review materials and conduct their assessment. Ocean Science Trust worked with the review panel to assemble and synthesize their written and verbal responses to guiding questions, as well as discussion from remote meetings into this final report. This report is publicly available on the Ocean Science Trust [website](#).

Additionally, OST led a community engagement webinar to answer questions about the peer review process and scope of the peer review. A summary of that meeting and all questions submitted are included in Appendix A.

## Project Materials Under Review (both available on the Ocean Science Trust [website](#))

1. CDFW submitted management strategy
2. TNC-led stakeholder submitted management strategy

## Review Recommendations

### Summary of Main Findings

Both teams submitted very different strategies that represent a tremendous amount of work to find management solutions for a very complicated recreational red abalone fishery where life history traits and uncertain environmental conditions play an active role. Given this, California Department of Fish and Wildlife (CDFW) and the Fish and Game Commission (FGC) have requested, and we recommend, a fisheries management plan (FMP) that can manage under any future environmental scenario and respond to changes in the red abalone population using the best available science. What we discovered during the course of this review was an opportunity to look at the data and strategies holistically to:

1. make recommendations to bolster the scientific rigor of each strategy, and
2. find areas where synergies between the two plans can come together and increase the chances of successfully tracking changes in this population in support of scientifically sound management decisions.

This review cannot provide advice on setting or deciding upon risk thresholds, management measures to accommodate different levels of catch, or determine appropriateness of opening a fishery with low levels of catch. While elements of these types of decisions could be supported by existing or new scientific analyses, they were outside the scope and time frame of this particular review. We have reviewed the scientific elements of all materials under review and made recommendations where further work is needed. Ultimately, we wanted to know under what circumstances a particular indicator or suite of indicators might capture or miss a rapid or slow change in the red abalone population. This is the lens through which we evaluated the materials under review. To put the rest of our review in context, we have summarized our findings about each strategy under review here. We address them simultaneously throughout the rest of the report.

## Summary of Findings of Each Management Strategy

### *CDFW submitted management strategy*

This management strategy emphasized the direct measure of biological and ecological conditions of red abalone for both setting catch in an open fishery as well as decisions about when to close and re-open the fishery. It has taken the traditional density approach and combined it with new indicators that are on the forefront of monitoring and predicting changes in the red abalone population (body condition, gonad health, kelp cover, sea surface temperature, etc.; Table 1). These measures make intuitive sense, but can be costly and logistically difficult to obtain. We believe that some subset of these indicators can likely provide the biological component needed to manage this fishery. However, without simulation testing (e.g., in these cases, computer-simulated population dynamics used to test a variety of questions regarding measuring and managing populations) of these indicators and better defined reference points, we cannot recommend which combination of indicators and reference points are most robust to uncertainty in red abalone status. Additionally, we know abalone density to be a preferable way to measure the population status. We also know it to be very labor intensive to collect enough data to make the metric informative at the scale at which it needs to be for making site or county level decisions.

Simulation testing could better establish how current or proposed density monitoring can be used as an informative metric for management decisions, as well as give insight into better ways to formalize the use of metric uncertainty (i.e. high variance) into decision making. Additionally, the density metric currently requires three years to get a complete set of data for all sites, thus increasing the chance that density could change in unsampled years/sites, limiting management responsiveness. We also believe that through simulation testing, CDFW can better understand how to use the new environmental and productivity indicators and find ways for them to better support more robust decision making. We also note that the type of evaluation done in the current strategy is insufficient for performance testing of indicators. Lastly, we want to highlight that we consider the biology of this species to be highly important to understanding the population of red abalone. We believe the other environmental and productivity indicators (especially kelp cover, gonad health, and body condition) need to be further explored, tested and refined. We think that this testing and refinement will lead to more meaningful indicators, that can be collected more quickly, and inform management decisions on a more timely basis, increasing scientific robustness.

### *TNC-led stakeholder submitted strategy*

This management strategy is a more traditional fisheries management approach for managing the fishery when it is open. It applies two relatively data-limited approaches, length based spawning potential ratio (LB-SPR) and catch-MSY, as indicators used to adjust catch. The approach was tested using simulation testing with an operating model approximating red abalone biology and population dynamics. This management strategy has the benefit of relying on tested and refined indicators used in other fisheries that have benefited from simulation testing. It also has the ability to track the general population dynamics with relatively little data, but with one major caveat: neither indicators, nor the operating model, incorporate the needed specificity in low density dynamics of red abalone. Our review found that the model does not explicitly incorporate certain low (e.g. Allee effect) or variable (e.g. body condition) population situations, making it difficult to determine how well this multi-indicator approach will perform at low densities, when disease alters population conditions, or if mortality events impact all lengths equally. There are currently no biological modifications in the interpretation of lengths to detect poor conditioned individuals.

Pairing this multi-indicator approach with other biological indicators that detect metrics such as low density dynamics and/or body condition issues could significantly improve performance. This will likely lead to different additional catch-setting situations to be tested, as well as modifications to the operating model to incorporate more specific low population dynamics conditions so as to better measure option performance. There is also the need to consider what methods and reference points would be used to reopen an already closed fishery.

## Summary of Peer Review Recommendation

As written, all strategies contain a high level of uncertainty. All individual indicators and the ways in which they operate under each management strategy need revision in order to reduce uncertainty. Given unpredictable data streams, changing ocean conditions, and unpredictable changes in the ecosystem where red abalone have traditionally thrived, it is advantageous that any plan leverages a suite of available indicators to present the clearest picture of the population status.

We want to emphasize that even though there were two approaches applied, they both come to the same conclusion with respect to the current status of the population. These common findings are ultimately how and why we think they can be integrated in support of better scientific grounding for management of this fishery. We found that both proposals could be strengthened by each other to ensure accurate and timely tracking of the red abalone population, subject to cost constraints. We have reviewed each indicator in and of itself and then made recommendations about how they could combine with other indicators to maximize synergy in this data-limited system.

***Recommendation 1: These two management strategies should be integrated to reduce uncertainty and take advantage of the best available science.***

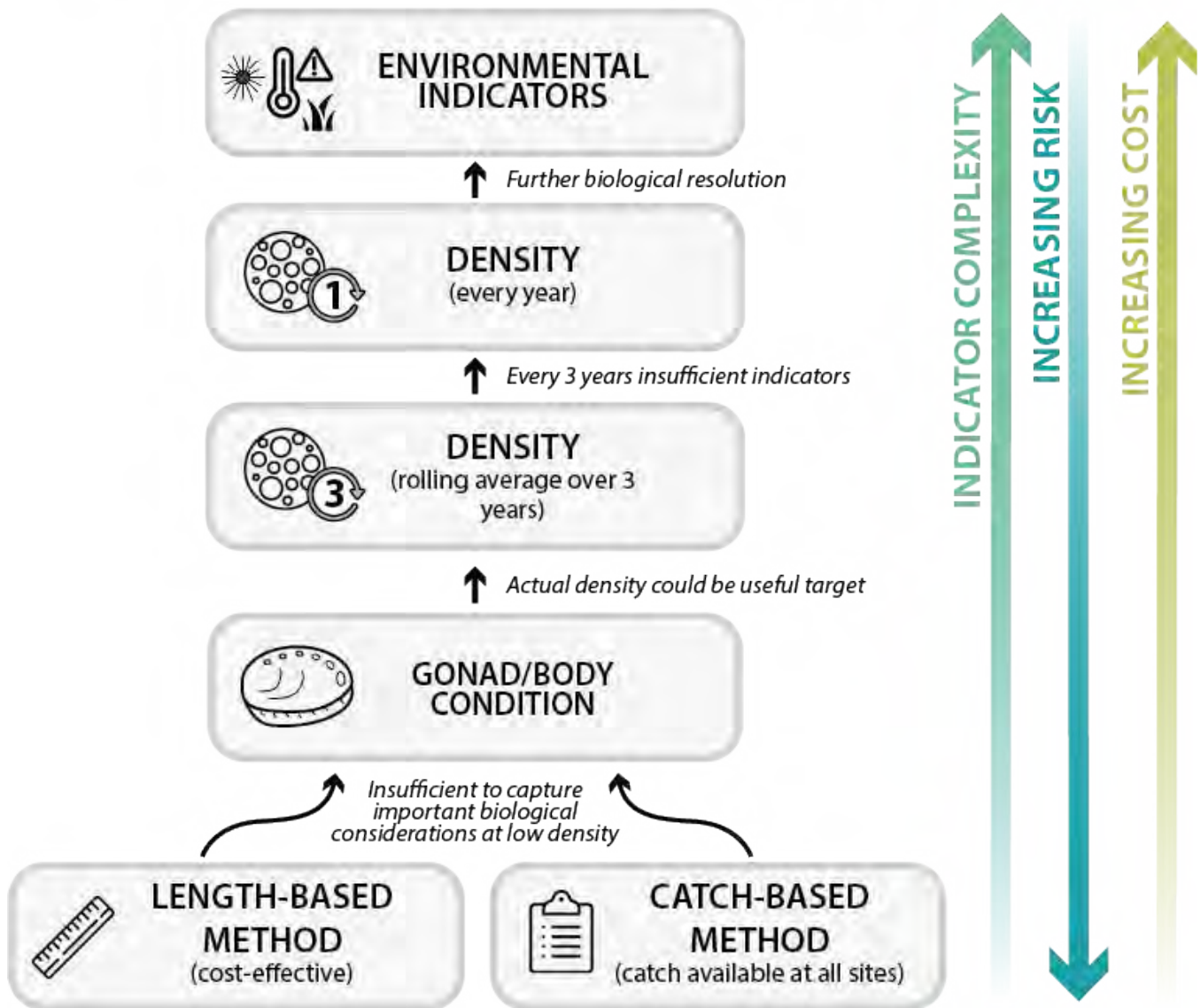
We find that while each plan could potentially be altered to operate independently of the other, high levels of uncertainty would remain regarding specific thresholds or triggers for opening or closing the fishery. This level of uncertainty means it is possible the models could result in decisions to fish the population when it should be closed or keeping the fishery closed when it could be open. Luckily, we found that elements of each plan, data streams provided, and thinking from both teams could be combined to form a potentially more cohesive plan and potentially greatly reduce the risk of overfishing and increase management performance. Throughout this report we have made several recommendations to make individual indicators more robust as well as highlight potential areas for integration. While no one can predict the future and there is no risk-free plan, careful consideration and integration of these plans, as well as specifying risk tolerance, can create a scientifically robust plan on which to make sound management decisions.

***Recommendation 2: The way to integrate indicators, data streams, and analysis should be tested and analyzed using simulation testing from a normal operating model specified to capture low-density population dynamics specific to red abalone.***

For this report we present examples of how to address these needed changes. We did not make specific recommendations about which suite of indicators would be appropriate and their respective reference points. This recommendation will require simulation testing on all indicators which was outside the scope and timeline for this review (see Table 1 for a full set of indicators under review). Simulation testing can help to illuminate the right combination of indicators that may reduce uncertainty below acceptable thresholds by balancing a combination of different data collection methods with various associated cost, risk, and statistical power (see Figure 1). This simulation testing, or modeling analysis, should be stress tested and analysed using computer simulations that are specified to capture low-density population dynamics specific to red abalone.

For this report we have summarized our review into two sections: 1) management strategies for re-opening, and 2) managing under an open fishery. However, these topics are highly interrelated and many recommendations from both sections apply to the other. For example, we talk about using environmental indicators, density, and LB-SPR in the re-opening section. However, we would not recommend applying any of these indicators or plans without implementing the two recommendations above.

# WHAT IS NEEDED AND CAN BE AFFORDED?



**Figure 1.** Theoretical flow chart indicating some of the ways in which different indicators can be visualized along the differing scales of complexity, risk, and cost. We selected several of the provided indicators to show the ways in which they compare on these scales, but did not include all provided indicators (see Table 1). Complexity refers to increasing the number of indicators that need to be monitored and reconciled with each other.



**Table 1.** List of the indicators, associated reference points, rationale or reference point chosen for each management plan. In some cases we indicate that there was no basis provided for the reference point. This simply means a written explanation was not provided in the written report. It does not mean that there is none, or that the indicator is not relevant to the fishery.

Plan Source	Management Phase	Indicator	Reference Point	Basis
CDFW	Catch-setti	Target catch	+/- 25% (no change to catch if within this range)	Wide enough to be insensitive to minor fluctuations (p. 5-12)
		Baseline catch	Catch average from 2002-2006	No large scale impacts to survival and fishery was stable
		Baseline density	0.63/m <sup>2</sup>	Average value during baseline years
		Density target	0.5/m <sup>2</sup>	Shift in fishery catch dynamics happens below this value (p 5-15)
		Average density limit	0.3/m <sup>2</sup>	Above 0.2/m <sup>2</sup> (the minimum viable population density set p. 5-16), limit based on site density to catch (App. B, Fig. 1)
		Site density limit	0.25/m <sup>2</sup>	Above 0.2/m <sup>2</sup> (the minimum viable population density set p. 5-16), limit based on site density to catch (App. B, Fig. 1)
		Regional density of deep water abalone	low: 0.2/m <sup>2</sup> ; high: 0.4/m <sup>2</sup>	Not specified in chapter 5
		Gonad index	<100 for ≥60 abalone that are ≥7"	Not specified in chapter 5
		Body condition	≥15% with shrinkage score >0 (sample size of ≥500 abalone)	Not specified in chapter 5
		Ocean temperature	>15°C at 30 ft. in Mendocino county on any day in the previous calendar year	Not specified in chapter 5
		Kelp abundance	≤30% historic max coverage in either Mendocino or Sonoma county	Not specified in chapter 5
		Sea urchin density	Combined density of red and purple are ≥5 urchins/m <sup>2</sup> at any of the index sites	Not specified in chapter 5
	Re-opening	Site density reopening threshold	>0.4/m <sup>2</sup>	Set to be 60% above the site closure trigger to buffer against re-closure
		Size frequency	≥40% legal-sized; ≥30% sublegal (with a sample size of ≥500 abalone)	Similar to baseline (2003-2007) condition
		Regional density of deep water abalone	>0.2/m <sup>2</sup>	Not specified in chapter 5
		Regional density reopening threshold	>0.45/m <sup>2</sup>	Not specified in chapter 5
		Ocean temperature	≥15°C at 30 ft. in Mendocino county on any day in the previous calendar year	Not specified in chapter 5
		Kelp abundance	≤30% historic max coverage in either Mendocino or Sonoma county	Not specified in chapter 5
		Sea urchin density	Combined density of red and purple are ≥5 urchins/m <sup>2</sup> at any of the index sites	Not specified in chapter 5
TNC-led	Catch-setti	LB-SPR	SPR/SPR <sub>MSY</sub> ; high (>1.1); stable (>0.9 & <1.1); low (>0.5 & <0.9); extremely low (<0.5)	Not specified in report
		Catch-MSY	U/U <sub>MSY</sub> ; U/U <sub>MSY</sub> levels: high (>1); low (<0.75), stable (>0.75 & <1)	U <sub>MSY</sub> = r/2 and U is catch in final year/B <sub>0</sub> ; Levels not specified



## I. Managing Under a Closed Fishery

In general, we found that the field sampling may provide some information on stock status, but does not alone give the robust tools needed to make management decisions about re-opening. At the beginning of this review, we received information from both teams with a variety of data streams and indicators which we think will be useful to making a robust plan for consideration of re-opening the red abalone fishery.

Because of the red abalone population decline and the current fishery closure, we believe it is important to first address the current situation of the fishery. The FGC closed the fishery due to evidence of a substantial decline in the population on December 7, 2017. Due to this shift in the population we initially focused on reviewing the data and the plan for re-opening a closed fishery, where provided, as well as all other data and indicators that could be used to inform managing under this closed fishery scenario. CDFW included a re-opening section in their plan providing a basis to make preliminary recommendations. We understand that this change in the abalone population is new and commend both teams for adapting their thinking and plans, where they were able, with available time and resources, to include this new information. Given the current status of the population, we think ensuring the scientific underpinnings of how to reopen the fishery is critical and timely.

### 1.1 Key recommendation

***Recommendation 3: All indicators chosen must be clearly defined, and ideally, all candidate reference points for any indicator should be tested using simulation testing in a closed loop analysis.***

Indicators from both plans, regardless of whether they appear in a re-opening context, should be evaluated for their usefulness in making management decisions related to re-opening. We recommend that any threshold or indicator chosen as part of the re-opening plan needs to be fully defined. This includes

- clearly stating the values for, and rationales for, indicator thresholds (which have been set and tested through formal simulation operating models)
- indicating the baseline or comparison of indicator status, whether it be a reference year(s), statistical summary, or data where applicable
- describing and demonstrating threshold detection analysis, including variance, power, etc.
- plans for how and when the data will be collected in support of measuring these thresholds and, where appropriate, back-up plans for when data sets are not available

Selecting reference points based on expert opinion or judgement may also be a viable route when other sources of evidence for setting reference points are not readily available. However, the scientific rationale for the specific reference points chosen needs to be well articulated and supported by multiple experts. Expert judgement may result in greater uncertainty regarding specific reference points. In some cases, setting an arbitrary number may be worse than not including the indicator at all or using a different framework for decision making. In this case, our understanding is that all of the indicators presented are sufficiently well-developed to have the information needed for at least basic testing using a formal operating model of the system, which can include evaluation of implications of data availability. These simulation models can help test and refine the relationship between these indicators and the red abalone population. Thus there should be no need to include indicators that rely on expert judgement alone.

We explore two indicators to demonstrate how to implement the above and the types of questions that should be asked.

- **Example 1- Kelp Cover:** The reference point for kelp cover under re-opening is 30% cover.
  - o How was this reference point chosen? Was it tested using simulation in a formal operating model?Answering these questions will aid in a more clear selection of
  - What the current kelp cover is being compared to (e.g. an average of all past years? The previous year? The whole area covering the fishery? Areas inside and outside of MPAs? Area by county? By site?)?
  - What types of data are acceptable for assessing this metric once established (e.g. kelp bed flovers, dive surveys, visual assessments from land)?
  - What should be done when these data are unavailable?
- **Example 2- LB-SPR:** This indicator was not discussed as part of the re-opening management strategy, however it could be included by setting a threshold level that the indicator would need to achieve (presumably from fishery independent sampling) for setting catch under re-opening. If LB-SPR is evaluated in a formal simulation model, and if selected, managers should assess and clearly address:
  - o How was this reference point chosen? Was it tested using simulation in a formal operating model
  - o How does the threshold value interact with the precision of reference point estimation in terms of assessing risk of re-opening, to both the stock and yield from the fishery?
  - o What does the status of additional (combination of) indicators need to be for LB-SPR to be used as a re-opening indicator?
  - o What should be done when length data are unavailable?

**Recommendation 4: A multi-indicator approach, with little to no tiering, where not all indicators need to be met (i.e. not adopting a “one out, all out” approach), may be more flexible and informative given the uncertainty of changing ocean conditions and the response of red abalone to these changes. The structure of this approach and choice about whether to make it sequential (single indicators triggering another single indicator and so on), tiered (groups of indicators that trigger next tiered group of indicators and so on), or simultaneous (all indicators assessed simultaneously) can and should be tested using a formal operating model, thus building in a structure that is not subjective.**

Given the uncertainty of data streams, changing ocean conditions, and the way different species and ecosystem features may interact with red abalone populations now and into the future, we recommend a re-opening plan that allows for flexibility and the possibility that red abalone may adapt to some of the “negative” indicators in the future. For example, if moving inshore becomes a way for abalone to find enough food, but kelp cover remains low, would this alone be a reason to keep the fishery closed if all other indicators are positive? Thinking through these types of emergent patterns along with their consequences is essential. We recommend using scenarios such as this to make decisions about how many of the indicators need to be met in order to move to the next tier of data collection or to open the fishery (e.g., the traffic light approach; Caddy 2002). A decision tree framework like the one already proposed could be adapted and a useful way of outlining this process.

Testing these decision points in simulation testing in a formal operating model is one way to provide rationale for these choices. Feasible structures for the sequence or tier structure can be assessed through participatory processes with experts, so as to ensure that the number of simulated possibilities tested is kept to a manageable number. It is impossible to anticipate the full range of possible future scenarios, but simulation testing offers a path to identify strategies that are unlikely to work, and ones that may be robust. Coupled with a detailed rationale for decision points associated with adaptive measures, this ensures a transparent way of continuing engagement. An adaptive FMP would allow for ongoing scientific engagement into the future as new, unanticipated scenarios come into play.

## 2. Evaluation of Management Strategies for Open Fisheries

As mentioned, GC requested from CDFW an FMP that can manage under any future scenario. Once a fishery has been deemed ready for re-opening, there is a need to have a plan with a strong scientific backing to ensure management decisions can respond quickly to changes in the population, especially given changing ocean conditions and the uncertainty created by them. Ideally, as recommended above, the plans for re-opening and managing after re-opening should mirror each other. This will streamline data collection, analysis, and management decisions.

This review was scoped to look at the scientific underpinnings of the elements provided in the management strategies and other materials provided (all materials available on the Ocean Science Trust [website](#)). While our review can illuminate the risk this may pose in terms of outcomes under different scenarios it cannot and it would not be appropriate for us to make decisions about the appropriate level of risk managers and fishing community members are willing to assume under any given management strategy. We attempted to provide insight about the inherent risk of missing a population change under each management strategy and make recommendations to improve performance should managers determine that the associated risk needs to be reduced. However, it was outside the scope of this review to determine management options for setting risk choosing management measures to accommodate different levels of catch, or to determine the appropriateness of opening a fishery with low or high levels of catch. Should this be of interest in the future, science can help managers and community members understand the risk associated with each of these and potential outcomes for the red abalone population, but it cannot make these value based judgements.

We assessed each indicator individually and holistically to determine how they might perform under different scenarios. Ultimately, we wanted to know under what circumstances a particular indicator or suite of indicators might miss a rapid or slow change in the red abalone population. This is the lens through which we evaluated the materials under review. We have evaluated the scientific elements of both and, when able, provided recommendations for strengthening the different components and the overall management strategies of both. It should be noted that it is outside the scope of this review to provide the best way to fix any weaknesses we may have identified.

We have concerns that even after incorporating the recommendations we provided, these plans individually could still lead to fishing on a population that is not sustainable or result in keeping the fishery closed longer than populations are able to sustain some fishing. Changing ocean conditions, changing dynamics of how red abalone interact with their environment, specifics of data collection and analysis, as well as the inherent attributes of these indicators, are among the factors that limit predictability in management outcomes here, and are not unique to this fishery.

Reviewing these two different approaches is actually fortuitous for red abalone management as it allowed us to see the relative strengths and weakness of each approach more clearly. As a result, our review finds and recommends that a more holistic approach be taken for the red abalone FMP. When looking at all components of the management strategies side by side, they provided a much more robust suite of indicators. Not only that, they seem to connect to each other in unforeseen ways, filling gaps and uncertainties in the other and vice versa. It is outside the scope of our review to provide a new integrated plan. However, we recommended that these plans be evaluated to determine the appropriate ways to integrate these indicators to come up with a comprehensive management strategy. By doing this work, and then evaluating it through a formal simulation operating model, the outcome will be a plan that is scientifically robust, uses a multi-indicator approach, and hopefully reduces the risk of overfishing.

**Each of these plans represent core components of what should be included in a scientifically robust management strategy for an open fishery. We see opportunity for them to work together holistically. In isolation, both plans under review have uncertainty that needs to be addressed in order to improve the estimates of population status. Integration of these plans, utilizing simulation testing, is recommended.**

Any FMP should use a Management Strategy Evaluation as a member of best practices, including stakeholder engagement. The target catch evaluation is useful for understanding past decisions and outcomes of alternative decisions given previous resource state, but is not a replacement for a formal Management Strategy Evaluation or other formal simulation testing. The current Management Strategy Evaluation could benefit from changes to increase its performance for the plan for which it was developed. For example, M used in the simulation system is based on an estimate from Leaf et al. (2007), and seems inconsistent with the one used in LB-SPR. There would likely need to be changes to the model to incorporate the recommendations in this report. For example, multiple indicators are suggested to be incorporated in the simulation model and management plan tested with the Management Strategy Evaluation framework. However, it is still an good basis for testing and refining a y one or a suite of changes made to the management strategies under review for incorporation into the FMP.

*In summary:*

- Capitalize on the strengths of the strategies already provided by integrating elements of both into a potentially more robust plan.
- In order to combat the possible loss of data streams, a multi-indicator approach that makes allowances for and explicitly states changes that need to be made when data streams become unavailable for any given indicator is preferred.
- The management plan should explore how the multiple indicators will interact. Does every indicator need to meet thresholds? Is a subset of the indicators meeting reference points enough to make management decisions (e.g. what happens when kelp cover and red abalone density are past the positive threshold, but urchin densities remain high)? Simulation testing can be used to test and describe this robustness.
- The management plan should explore the order of operations for any suite of indicators and how they work together.

## 2.1 Key recommendations

**Recommendation 5: Setting reference points for every indicator is critical.** (See also recommendation 3)

All reference points need to be more explicitly defined including information on what they are and how reference points were set (Table 1). There needs to be more justification and better articulation on their contribution to the management plan, how and why they were selected, and their role in making specific management decisions, including fine and coarse tuning. Our strong recommendation is to test these indicators (as described in the above recommendations) in a simulation modeling scenario wherein this uncertainty can be explored and proper thresholds that formalize the way in which you deal with uncertainty can be explored (see also recommendations 8, 9)

We have provided the following examples as guidance for how to implement this recommendation for any indicator chosen to include in the management strategy:

- *Example 1- LB-SPR:* This indicator is used to reflect the exploitation intensity through observed length frequency. However, in cases such as unexpected high mortality across ages and sizes, small sample size, poor gonad or body conditions, and population aggregation etc., this indicator may not be able to detect the correct signal of the population status and exploitation over short time scales, likely greater than one year but less than three-four years. The LB-SPR indicator may make sense at higher population sizes not affected by low-density population dynamics (e.g., Allee effects), but at reduced population sizes, this indicator a) needs to be tested for robustness to these Allee effects and b) would benefit from additional biological indicator(s) that better captures red abalone population dynamics at low population sizes or in instances where lengths are less informative of mature biomass (e.g. poor gonad or body condition).

One solution to test would be extending LB-SPR by using length frequency across multiple years to validate the population results behind the data instead of only using yearly observations separately. LB-SPR may also be used to simulate a “healthy” length frequency target and threshold (e.g.,  $P(L > L_{\text{sublegal}})$ ) under alternative conditions so that length distribution can be used as one of the indicators in opening or managing the fishery, which is how it is currently being used in the proposed strategy.

- **Example 2- Kelp Cover:** As it stands there is very little certainty about the thresholds that have been set for this indicator as well as the other productivity and environmental indicators or the ways in which they directly correlate to the red abalone population itself (see Table 1). In theory, kelp cover should indicate the abundance of a favored food resource for red abalone, presumably the availability of drift kelp. The dominant kelp in northern California is *Nereocystis lutea* (bull kelp), an annual species, that can be a responsive indicator of annual ocean conditions impacting kelp populations (waves, warm waters, nutrients, etc.). However, the relationship between kelp cover of *Nereocystis*, drift kelp abundance, and red abalone condition has not been established (nor has the form of the relationship). Thus the basis for any particular threshold in kelp cover is unclear and has a high degree of uncertainty associated with it, given the available evidence.

As a result, it should not be used directly to trigger management decisions. However, given there is a known trophic link between these two species, and between ocean conditions and kelp cover, it may be beneficial to use a conservative kelp cover threshold to trigger inclusion of other indicators (e.g., gonad condition), as is the case in the CDFW management strategy currently. Indicators such as this should be treated as uncertain and therefore there should be flexibility and adaptive capacity should be built into the system to change these indicators as more information becomes available or to bypass them entirely should the red abalone population show other signs of recovery.

***Recommendation 6: All indicators should be evaluated alongside each other in formal simulation modeling to set reference points and to test and determine the appropriate suite of indicators.***

Both management strategies presented approaches that need to be bolstered in order to reduce uncertainty. We recommend taking a holistic approach and assessing all indicators alongside each other to find the right subset of indicators to reduce uncertainty using a formal operating model, such as a Management Strategy Evaluation. One management strategy under review relied heavily on density while the other under review relied on LB-SPR and exploitation rate estimates. Other indicators were included (e.g. body condition, gonad health, etc.), but we focus on the two prominent ones.

Below we demonstrate the concerns with the two indicators and then show the ways in which these concerns could be alleviated through integration

*Prominent indicators as currently used:*

- **Density (10 sites):** Length frequency density data are the gold standard for tracking invertebrate populations. The issue is that these data can be highly variable and very time consuming or costly to gather at the level needed to be scientifically meaningful for fisheries management. For this density indicator, as currently implemented, the length of time required to revisit each site (three years) as well as the low levels in the power analysis at anything other than the whole fishery (which takes three years to complete) makes it inadequate for informing annual management decisions, especially when environmental conditions change rapidly. Additionally, this indicator for red abalone varies substantially among local sites surveyed. Gaps in data between years for different sites confounds estimates of change among years with changes in site representation in the data set. As a result, changes in apparent population status between adjacent years (or lack of change) might be incorrect and cause the fishery to either close or re-open when not warranted.
- **LB-SPR (15 sites):** LB-SPR is a traditional fisheries management tool and uses an assumption that changes in the population are related to mortality events, including fishing. Here in California we know that changes in the population can be due to either catch, environmental conditions, or other unidentified mortality sources

such as poaching. Given the life history traits of red abalone, it will not be sensitive enough to recognize changes in the population under changing ocean conditions, when body conditions change and especially when population size is low, and low-density population dynamics prevail. Under plausible scenarios, this indicator could take several years to indicate a change in the population. Pairing this indicator with catch-MSY alone is not sufficient to make up for this potential to allow higher levels of fishing on a population that is in decline. We also have several concerns that the Management Strategy Evaluation that evaluated LB-SPR and catch-MSY did not show any sensitivity to changes in harvest or other events that mimic those such as harmful algal blooms, disease, starvation, etc. We suspect that this is due to the lack of biological indicators and speaks to the need for an analysis of whether or not the LB-SPR metric is able to detect changes in the population at very low densities.

#### *Investigating the right suite of indicators for an integrated management strategy*

This should be done through a series of evaluations using a formal operating model such as a Management Strategy Evaluation on all indicators provided in both strategies. While it is outside the scope of this review to find or select all options, here are several for consideration and testing. This should be done for all indicators in Table 1 to determine the right suite of indicators needed to meet management goals:

- We know that density and LB-SPR can be correlated with each other. One concern under LB-SPR is that when density declines to low levels, that LB-SPR is masking Allee effects. It could also be masking other indices of populations such as body condition, etc. that may or may not be linked to density. Density can be used to set a LB-SPR threshold above which we know there is very little chance of Allee effects or other low density effects that are undesirable. Therefore, LB-SPR threshold could be set high enough where we have strong scientific confidence that it is well above the level of density where it stops being able to track changes in the population.
- LB-SPR may also be masking population changes (such as the current one) where the population is in decline. There are two separate issues: 1) a discrete mortality event that affects all size classes would not cause an immediate change in LB-SPR, but would show up in density estimates; 2) an overall increase in mortality due to poor conditions will change LB-SPR (even if it is affecting all size classes equally) but the change may be slow enough to have a lag in detection.
- Density estimates have other deficiencies (see above). Density needs to be paired with indicators that can be collected on an annual basis and with greater statistical power. By pairing biological indicators such as density with body condition and/or gonad size, along with LB-SPR the ability to track changes in the population and detect them earlier is increased. Simulation modeling can and should test how and if these two indicators, LB-SPR and density, track alongside each other. It also relieves the need for density information to be collected at every site on a yearly basis in order to be meaningful (note: we did not test that sampling all 10 sites on a yearly basis would allow for the power needed to make management decisions on a yearly basis at any scale finer than fishery-wide).
- All of these changes should be tested in formal closed loop simulation testing that can help set the specific triggers related to density, LB-SPR, body condition, etc.

#### ***Recommendation 7: All indicators need to transparently indicate, and then formalize the way in which they deal with uncertainty.***

Each of the indicators (Table 1) presented in both of these management strategies are not measured without error. However, the levels of uncertainty vary across these indicators. This uncertainty needs to be more transparently described in how it is calculated and formally treated in the management procedures. This formalized treatment currently seems to ignore all uncertainty by using a measure of central tendency, avoiding the risk associated with uncertain values. Whether directly measured (e.g., abundance) or estimated (e.g., LB-SPR), each indicator should not assume the median value is the best choice for management use. Any indicator with high amounts of uncertainty that uses the median could wrongfully declare a fishery open or closed, or increase or reduce catches when the opposite should have been done.



Uncertainty can be dealt with in many ways. One common approach is to define a quantile that is below the median value (i.e., 0.5; Ralston et al. 2009). This approach could be considered for any of the indicators in Table 1, and the exact value should be tested for robustness in a simulation testing framework. Other scientific methods for dealing with uncertainty were outlined in the red abalone density estimate peer review (SAC 2014). However it is done, all indicators should have some consideration on how uncertainty is treated and the proposed treatment performance tested under different scenarios.

***Recommendation 8: The science underlying setting catch levels needs to be re-evaluated and re-configured***

*Recommendation 8.1 Consider changing the order of operations or indicators when setting catch.*

We recommend that both management strategies, as well as any integrated options, reconsider the order in which indicators are used and the ways in which they connect. Typically, indicators with robust reference points are used to set catch limits. This is important because they are clearly defined and uncertainty has been quantified. Additionally, perceptions of resource status and confidence in advice one comes can sometimes be biased by the order in which operations are done with respect to expected baseline or reference values. Although several orderings of operations may lead to the same outcome in terms of advice, some may be more preferred by relevant stakeholders. Several examples of this include:

- Reversing the order in CDFW approach. Usually catch is set by first using indicators that have robust biological reference points that adjust catch. However, the CDFW approach starts with catch and then uses different indicators to adjust it. This is problematic because the indicators of current status are not the ones being used to determine exploitation levels.
- LB-SPR can provide a relative measure of stock status (e.g., transient LB-SPR). Relative stock status is an input into the catch-MSY method. It is suggested that the estimate of LB-SPR be considered as a prior for the stock status input of the catch-MSY method so as to make the catch estimation more consistent with the length information on stock status. This would avoid having to define decision rules for either LB-SPR or exploitation status, and would directly use the catch-MSY estimates of catch to set the sustainable catch limits. Some thought on the appropriate measure of uncertainty (likely underestimated by LB-SPR) for the prior would still be needed, and could be explored through sensitivity analyses in LB-SPR.
- By implementing recommendations 1 and 3 (above), alongside a formal Management Strategy Evaluation (recommendation number 11 below) on all indicators and their reference points, there can be a more scientifically robust way for determining which indicators work best together and which ones are redundant for providing catch advice.

*Recommendation 8.2 The mechanisms for setting catch need to be re-evaluated and perhaps merged.*

Both plans presented different mechanisms for setting catch. And again we find that neither is complete in and of itself. Using a baseline catch, as used by CDFW to set current day catch where conditions and population levels are completely different, is likely not going to be useful going into the future. The population may be continuously over or under fished given the adjusted percentage of changes in catch, especially when the uncertainty of the indicators are of high levels. The baseline catch approach is also difficult to use when a population is largely depleted, or when a population is recovering. Under the TNC-led management strategy, catch is set using a combination of LB-SPR and catch-MSY ratcheting down over time. This is problematic because of both the potential delays in tracking declines in the populations and the lack of having clearly demonstrating that this ratcheting down of the catch will not result in fishing on an overfished or decimated population (i.e. it needs to be better demonstrate why there is not a need for a threshold or reference point at which the fishery closes). One option for integration might be that by jointly using density as a reference point together with LB-SPR, to assess stock status, and using catch-MSY for setting catch.



***Recommendation 9: Align the re-opening plan to match how the fishery is managed under other management scenarios to streamline data collection, analysis, and the decisions that follow.***

This last recommendation should be addressed as time and resources allow. Streamlining the re-opening and the management after re-opening can often be simpler, more transparent, cost effective, and in alignment with fisheries management best practices

## References

Caddy, J. F. 2002. Limit reference points, traffic lights, and holistic approaches to fisheries management with minimal stock assessment input. *Fisheries Research* 56:133–137.

Leaf, R.T., Rogers-Bennett, L. and, Haeuber, P. 2007. Spatial, temporal, and size-specific variation in mortality estimates of red abalone, *Haliotis rufescens*, from mark-recapture data in California. *Fisheries Research* 83: 341-350. doi:10.1016/j.fishres.2006.10.017

Ralston, S., Punt, A.E., Hamel, O.S., DeVore, J.D., and Conser, R.J. 2011. A meta-analytic approach to quantifying scientific uncertainty in stock assessments. *Fishery Bulletin* 109, 217–232

Science Advisory Committee. 2014. Red Abalone Density Review Scientific and Technical Review of the Survey Design and Methods Used by the California Department of Fish and Wildlife to Estimate Red Abalone (*Haliotis rufescens*) Density.

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# Public Webinar to Discuss the Red Abalone Community's Science-based and Peer Review Process Related Questions

## Summary of Key Themes

### Recreational Red Abalone Fishery Peer Review

August 20, 2018 | [Webinar Recording](#)

#### Overview

California Ocean Science Trust (OST), as requested by the California Fish and Game Commission (FGC) and the California Department of Fish and Wildlife (CDFW), coordinated an external, independent peer review to support the design of a recreational red abalone fisheries management plan (FMP). From June-October 2018, a peer review panel evaluated the scientific merits of two proposed management strategies. In an effort to promote open lines of communication and engage in information sharing with members of the red abalone community, OST, in partnership with the peer review co-leads and panelists, convened a public webinar on August 20, 2018 to:

- Learn about and discuss the red abalone community's science-based and research questions;
- Share information regarding the peer review process, including the data and questions that are currently being considered by the reviewers; and
- Build collective understanding of how the peer review aligns with the FMP process, including timelines and additional engagement opportunities.

Prior to the webinar, OST invited red abalone community members to submit their science-based and peer review process questions. More than 50 questions were received prior to August 20. Responses to these questions became the foundation for the webinar discussion and additional questions were also asked during the webinar (see Appendix 1 for complete list of questions received). Over 70 community members participated in the webinar.

The following document provides an overview of the questions asked and discussion topics and ideas that emerged from the webinar. This summary is intended to capture high-level details and key themes, rather than a transcript of the discussion. A full recording of the presentation, along with documents discussed during the webinar, are available on the [Recreational Red Abalone Peer Review webpage](#) on OST website.

Please contact Errin Ramanujam, OST, with any additional questions and comments:  
[errin.ramanujam@oceansciencetrust.org](mailto:errin.ramanujam@oceansciencetrust.org).

## I. Background Information

### About Ocean Science Trust

- OST is an independent nonprofit based in Oakland, California. OST is not a government agency, and has no regulatory or management authority. Rather, OST is legislatively mandated to provide independent science to the State of California.
- With the main objective of providing sound, rigorous science to assist managers, policy makers, and community members in decision-making, OST does not advocate for particular policy or regulations. The organization frequently develops and delivers science in close collaboration with academic, federal and state scientists, and community members.

### Recreational Red Abalone Fishery

- A primary goal of fishery management under the Marine Life Management Act (MLMA) is to ensure that fishing levels are sustainable and do not result in an overfished stock. This includes the recreational red abalone fishery. While past landings from 2002-2011 appear to be stable, recent declines in subtidal stocks have been recorded and the fishery was closed December 7, 2017.
- Red abalone has several characteristics which make it vulnerable to fishing pressure and environmental fluctuations. Recent declines and concerns about changing ocean conditions have prompted CDFW to develop a Recreational Red Abalone FMP to improve data collection and support timely management response.
- Proposed management strategies to be included in an FMP are required by the MLMA to undergo external, independent peer review prior to submission to the FGC. The peer review process provides CDFW, the FGC, and stakeholders assurances that FMPs are based upon the best readily available scientific information.
- Currently, there are two proposed management strategies being considered for incorporation into a Recreational Red Abalone FMP:
  - A [management strategy proposed by CDFW](#)
  - A [stakeholder submitted management strategy](#), led by The Nature Conservancy (TNC)

### Peer Review Process

- As noted in the 'Overview' section of this document, OST, with support from the Ocean Protection Council (OPC), was requested by the FGC and CDFW, to coordinate an external, independent peer review of the two proposed management strategies.
- A scientific peer review panel of seven scientists was selected by the OPC Science Advisory Team (SAT) Executive Committee. The peer reviewers specialize in a range of disciplines including fisheries science, ecology, oceanography, population dynamics, etc.
- The peer reviewers' responsibility is to review the science presented in the two management strategies and evaluate each approach to make sure the management strategy that gets incorporated into the FMP will use the best available science to inform management decisions. All aspects of both proposed strategies were reviewed, including how each will support a robust FMP individually, as well as how the ideas presented across strategies could complement each other.

## II. Key Themes Summary of Questions & Responses

The majority of the questions received in advance of the webinar mirrored topics, or ‘bins,’ that reviewers are considering during the peer review process. These included:

- How the peer reviewers are approaching their review of the two plans
- Indicators and changing ocean conditions
  - Productivity indicators
    - Density indicators
    - Reproductive indicators (gonad and body condition)
  - Length-based Spawning Potential Ratio (LB-SPR) & catch maximum sustainable yield (catch-MSY)
  - Environmental indicators
  - Indicators under different scenarios
- Management measure effectiveness

In addition to the questions received prior to the webinar, those who participated in the discussion on August 20 also were invited to share their science-based and process related questions. The following ‘Questions and Responses’ section considers all questions that were asked prior to and during the webinar (see Appendix 1 for a complete list of questions received from members of the red abalone community).

### Peer Review Approach to Two Management Strategies

Participants asked how peer reviewers are considering the two management strategies and if they are considering ways to integrate the strategies.

- The peer reviewers are approaching this unique review holistically. They have been tasked with illuminating the scientific strengths and weaknesses of each plan, along with the ability to provide any recommendations for improvements for each management plan or identify clear areas of synergy between the two documents.
- The peer reviewers are identifying areas where both plans could be strengthened by utilizing components of the other plan. In addition, they are also thinking through scientific recommendations about how to strengthen components of each plan independently of the other.

### Indicators and Changing Ocean Conditions

#### *Productivity Indicators- Density*

**Density survey design and methods:** Participants asked for clarification on red abalone survey design methods, the differences between the “rapid” assessments and the standard density assessments, whether CDFW changed their density protocol since 2014, and whether changing the survey protocol during the baseline years (2002-2007) or after that period changes the ability to make comparisons between years.

- The peer review is looking into the accuracy and reliability of the density survey estimates as it relates to the CDFW submitted management strategy. This includes investigating the precision with which data are informing management decisions at different spatial scales.
- Peer reviewers discussed how density, when surveyed accurately, can be used as a proxy for nearest-neighbor measurements. This is important for red abalone due to their need to be within a certain short distance of other abalone for successful spawning events.
- The cryptic nature of red abalone has been addressed through survey methods that require thorough counting by divers.

- Standard surveys collect information on habitat as well as numbers, while rapid surveys focus on the numbers.
- Density as an indicator is used differently in the draft management strategy submitted by CDFW than it was previously used. For example, to account for the implementation of marine protected areas (MPAs), CDFW modified baseline density estimates for areas that previously allowed the take of red abalone and now overlap with no-take MPAs.
- Reviewers are also looking into how both rapid and standard density surveys are being used to make management decisions.

**Density as an indicator for setting target catch (CDFW proposed management strategy):** Participants asked whether the density survey methods, data collection, estimates, and analysis are robust enough to manage the fishery in a timely manner. In particular, participants wanted to know if the way CDFW uses density in their proposed management strategy qualifies as a scientifically and statistically robust indicator.

- The peer reviewers are considering the use and reliability of density estimations provided in both management strategies.
- Typically, density is a good indicator of a healthy red abalone population, but the peer reviewers are reconciling whether the density estimations and the use of their results are scientifically sound as currently described in both management strategies.

**Baseline density to set target catch (CDFW proposed management strategy):** Participants asked whether the baseline that was established by CDFW using data from 2002-2007 is scientifically accurate and robust.

- Peer reviewers are considering the degree of accuracy needed for the baseline given current and past recorded red abalone landings. The peer review is ascertaining whether the level of resolution and the population that was present in 2002-2007 is the level needed to be considered sustainable.

**Density and the TNC-led stakeholder proposed management strategy:** Participants asked about the TNC-led stakeholder proposed harvest control rule (HCR) and whether the proposed management strategy incorporates the density-dependence of abalone into any of the strategy's analysis or operating models. If this is not the case, participants were also interested in learning whether not including density-dependent data is scientifically supported given the biological need for abalone to be close to one another for successful reproduction.

- The peer reviewers are looking at this question when reviewing the TNC-led stakeholder proposed management strategy, including determining the need for additional information about red abalone density-dependence at low population levels.
- The panel is also considering how removing density-dependent data from the analysis/models may impact the proposed management strategy, what the implications may be, and if the inclusion of other indicators is warranted.

**Density as an indicator under changing ocean conditions:** Participants asked how movement of abalone from the deep to nearshore environments affects density estimates and how different size classes are handling food loss.

- The peer reviewers explained that conditions have changed in the last couple of years since the two proposed management strategies were developed.
- While regional environmental conditions have led to the starvation and, due to lack of food, there appears to have been a migration from subtidal to very shallow regions. This movement could be a change due to migration of abalone seeking out food in the intertidal areas.

- Data suggests that all age classes of red abalone seem vulnerable to starvation and there is no size bias for food loss.

### ***Reproductive Indicators (Gonad & Body Condition)***

Participants asked about the reproductive indicators included in the CDFW proposed management strategy (e.g., gonad size & body condition) and whether there is a scientifically proven link between body mass index estimates, gonad size, and the potential for abalone to reproduce. Also, participants asked if there is a scientific basis to changing the size limit to greater than seven inches to improve the reproductive capabilities of abalone.

- The peer reviewers explained that in theory, there is a relationship between body size and the number of babies an abalone can produce. This relationship would be dependent on a healthy population of abalone that are located close together.
- If the shell is big, but the body condition is poor, then the animal might not be able to reproduce. Consequently, shell size may not be linked to reproductivity.
- In theory, increasing the take size of red abalone should increase the number of gametes, which should in turn increase the number of babies. But this also assumes that abalone are healthy and located in close proximity to one another.

### ***Length-based Spawning Potential Ratio (LB-SPR) & Catch Maximum Sustainable Yield (catch-MSY) Indicators***

Participants asked if the TNC-led HCR and its components, LB-SPR and catch-MSY, are a scientifically sound approach to managing a fishery, if it is affected by the movement of abalone, and whether it would protect against the harvest of depleted populations under unfavorable recruitment or abundance conditions.

- The peer reviewers are considering all of these questions.
- The peer reviewers are looking into how LB-SPR is used in the HCR proposed by the TNC-led stakeholder management strategy. The peer reviewers are investigating how this indicator operates in a fishery with life history traits like red abalone.
- The peer review panel has looked at the TNC HCR simulation results from the Management Strategy Evaluation and is still reviewing how the simulation results may vary under different recruitment results and natural mortality scenarios.
- The peer reviewers are also investigating the TNC HCR and its simulation testing outputs with relation to how the management strategy operates at high and low densities of abalone.

### ***Environmental Indicators***

Participants asked if the environmental indicators and triggers set in the CDFW proposed management strategy (kelp canopy, water temperature, and urchin densities) are accurate and scientifically rigorous. In addition, participants asked how red abalone populations inside MPAs, and the role of MPAs more generally, factor into population estimates, the impacts of fishing, and environmental conditions.

- The peer reviewers are considering all of the environmental factors mentioned and how they could be used in a management strategy. Kelp canopy, water temperature, and urchin densities are known to have dramatic impacts on populations and the peer reviewers are investigating the scientific underpinnings of these as indicators in a management strategy.
- The population size in MPAs could be used as a reference point for populations outside of MPAs where the harvest of red abalone is permitted. The peer review panel is considering the best way to use MPAs as a reference point.



- The peer review panel is evaluating the methods proposed for utilizing the environmental indicators and triggers and how they will respond to changing ocean conditions. It is not within the scope of this peer review to consider how CDFW will address future ocean conditions through changes in survey method or in management response.

### ***Indicators Under Different Scenarios***

**Abalone Recovery & Re-opening:** Participants asked how long will it take for red abalone populations to recover, whether using historic density levels to establish criteria for reopening the fishery makes sense considering the long-term impacts of global warming, and if a new reduced criteria should be used to establish a sustainable fishery at a smaller abalone density and catch level. Participants also asked if different elements of reopening under the CDFW proposed management strategy are scientifically sound and robust, including the thresholds for tracking changes in the population and how they are used to make management decisions about reopening.

- Peer reviewers are considering these questions, however it is unlikely the questions will be addressed during the review because more information needs to be gathered to understand what the answers are.
- The idea of allowing very low catch levels is a management question. Science can help managers and community members understand population levels and assess impacts to stock at various levels of take (although this question is outside the scope of this peer review), but the decision to allow access and determine the level of risk to damaging the stock is ultimately a management decision.
- The peer review panel considers reopening to be part of the scope of the review and has asked CDFW and TNC how they could include metrics that take reopening into consideration. The panel is will review any additional information received from CDFW and TNC.

**Kelp:** Participants asked whether the fishery should be completely closed until kelp beds return.

- Kelp is an indicator in the CDFW proposal, but the peer reviewers noted that the proposed way to assess kelp is based on aerial photographs of the coastline, yet several kelp species are not viewable from the air. The peer reviewers are considering this information to assess if kelp, as proposed, is a scientifically rigorous indicator.

**General:** Participants asked about priority gaps in research and monitoring and whether CDFW will be able to collect and maintain the information necessary to achieve management targets for the stocks. In addition, there was interest in understanding how both proposed management strategies are taking into account the different habitats in fished areas.

- The peer review panel has not been tasked with identifying priority gaps in research.
- Peer reviewers are considering the habitat and spatial components included in both proposed management strategies.

### **Management Measure Effectiveness**

Participants asked whether the different management measures proposed in both proposed management strategies are effective at regulating catch, viable for dealing with poaching, and consider the possibility of urchin culling for restoration.

- Evaluating management measures, including enforcing poaching and removing urchins, are outside the scope of this review. Participants are encouraged to reach out to Sonke Mastrup, CDFW Environmental

Program Manager, Invertebrate Program, with thoughts and questions. He can be reached at [Sonke.Mastrap@wildlife.ca.gov](mailto:Sonke.Mastrap@wildlife.ca.gov). Participants are also welcome to bring these types of questions to upcoming Fish and Game Commission meetings where the Recreational Red Abalone FMP will be discussed ([schedule here](#)).

#### **Additional Areas of Interest Identified During the Webinar**

Participants had additional questions that were not addressed during the webinar. These included questions about monitoring, data sharing, and additional clarifications about current and proposed methodologies. Many of these questions will not be addressed by the peer review. As mentioned above, CDFW encouraged participants to reach out to Sonke Mastrap and/or bring these types of questions to upcoming Fish and Game Commission meetings.

## **Appendix 1: Community Questions**

### ***Peer Review Approach to Two Management Strategies***

- How are the peer reviewers thinking about their review of the two management strategies?
- Are the peer reviewers thinking about ways to integrate the plans?
- How will the peer review inform management decisions once completed?

### ***Indicators and Changing Ocean Conditions***

#### ***Productivity Indicators***

##### **Productivity density survey design and methods**

- How do the surveys consider the cryptic nature of abalone (e.g. some on top of rocks, others below)? How does this affect the reliability or accuracy of the density survey data?
- What are the differences between the “rapid” assessments and the standard density assessments and are they statistically directly comparable?
- Has CDFW changed their density protocol per the recommendations of the 2014 OST convened peer review? Has this addressed the concerns raised? If so, how scientifically robust and statistically significant are the density surveys the way the CDFW uses them in the current proposed management strategy/plan, both for overall density and for deep water density?
- Has there ever been a change in the protocol for density transects since the baseline data was collected from 2002-2007, and if so, what effects do those changes have on comparisons between the baseline period and subsequent years?
- What is the appropriate level of density data to acquire for it to be useful for making management decisions?
- How are changes in size limited related to nearest neighbor differences?
- How is the density indicator impacted by the population outside the center of the management area?

##### **Using density as an indicator for setting target catch (CDFW plan)**

- Are the density survey methodology, data collection, estimates, and analysis robust enough to use to manage the fishery in a timely manner? If not, how much more data would be required to achieve this? How much would it cost to gather this additional information?
- Is the way CDFW uses density in their proposed management strategy a scientifically and statistically significant indicator?
  - Are the more limited site-specific monitoring and control rule provisions sufficient to account for the spatial specificity of abalone population dynamics?

#### ***Density Indicators***

##### **Density as an indicator for setting target catch (CDFW plan)**

- Is the baseline that has been established using data from 2002-2007 scientifically accurate and robust? Is there a scientific basis to continue using it?
  - Is there a chance that this baseline is artificially high due to the extinction of the abalone primary predator, sea otters, before this baseline period began?
  - Does fishing replace otters as the abalone main predator? How does the rate of fishing predation compare with otters?

##### **Density and the TNC-led stakeholder proposal**

- Does the TNC-proposed harvest control rule (HCR) incorporate the density-dependence of abalone into any of their analysis or operating models?

- Is the decision to eliminate density-dependent data scientifically supported given the biological need for abalone to be close to neighbors for successful reproduction?

#### **Density as an indicator under changing ocean conditions**

- How does the movement of abalone from deep water into nearshore environments impact the density estimates, including CDFW's use of deep water transects as part of that density estimate methodology?
  - Does the movement of abalone out of the deep water refuge change how CDFW thinks about maintaining a sustainable fishery?
  - How does this affect overall densities and their statistical reliability?
- How are the different size classes handling the loss of food? Is the loss of food affecting each size class differently?
- How does the reproductive potential of abalone at different sizes affect the indicator? Do abalone stop reproducing at certain sizes?
- How much do we know about gonad size and body condition as it relates to abalone reproduction?

#### ***Reproductive Indicators (Gonad & Body Condition)***

##### **Productivity – Reproductive**

- For the reproductive indicators utilized by CDFW (e.g., gonad size & body condition), is there a scientifically proven link or relationship between the estimate of body mass index and the abalones ability to reproduce?
  - How about for gonad index?
- Is there a scientific basis to changing the size limit to greater than 7" will improve the reproductive capabilities of abalone?
- Is the overall management target of maintaining 60% egg production appropriate and scientifically well supported?

#### ***Length-based Spawning Potential Ratio (lb-SPR) & Catch Maximum Sustainable Yield (MSY) Indicators***

- Does the movement of abalone affect the way the TNC HCR works?
- Does the TNC HCR represent a scientifically sound approach to managing a fishery? Would it potentially allow harvest on depleted populations or under unfavorable recruitment or abundance conditions?
- How is MSY determined with length based SPR when the abalone is atrophied and how would that information be applied for viable abalone management measures?

#### ***Environmental Indicators***

- Are the environmental indicators and triggers set in the CDFW proposed management strategy accurate and scientifically rigorous (eg. kelp canopy, water temperature, and urchin densities)?
- How do the MPAs and populations inside the MPAs factor into the population estimates and the impacts of fishing and environmental conditions? Could population dynamics inside the MPAs bound models?
- Do these environmental indicators or the way they are used allow for changes in survey methods if there are changes in the environment in the future? Is there a public process before these changes in methodologies could occur?
- Will the peer reviewers be assessing each environmental indicator?
- How scientifically viable are the thresholds associated with each indicator? Should there be a range rather than a specified number?

#### ***Indicators Under Different Scenarios***

#### **Abalone Recovery**

- How long will it take for the population to recover? How long will it take for abalone to recover to a density greater than .45/m<sup>2</sup>?
- Considering the likely, long-term impacts of global warming, is it defensible to use historic density levels to establish criteria for reopening the fishery? Should new, reduced criteria be used to establish a sustainable fishery at a smaller abalone density and catch level?
  - Is it possible to manage the fishery to a much lower level of take and have it be sustainable and/or recover to better levels over time?
  - What additional science/data would be required to assess the risk of reopening the fishery?
  - Are the trade-off considerations between catch reductions and recovery discussed in the TNC report (and elsewhere)? Is this proposed approach well-founded and appropriate? Is 25 years a suitable recovery timeframe?

### **Abalone Fishery Reopening**

- Are the different elements of reopening under the CDFW plan scientifically sound and robust?
  - What is the mechanistic link between the environmental and density (> 0.25 m<sup>2</sup>) thresholds set by CDFW and the stock status of abalone, and how does the CDFW explicitly define favorable, as they relate to fishery reopening?
  - What is the scientific relevance of the size class distributions as outlined in the plan (i.e. sub-legal sized population of abalones be >30% of the total population and that legal sized abalone have a population >40% of the total)?
  - What research or analyses are available to inform the choice of thresholds for these environmental indicators (under reopening especially) to demonstrate that they are “favorable”?
- Are the thresholds scientifically robust and relevant for tracking changes in the population and making management decisions about reopening?

### **Kelp**

- Should the fishery be completely closed until kelp beds return?

### **Indicators Under Different Scenarios — General**

- Are research and monitoring needs comprehensive to allow CDFW to collect and maintain essential fishery information necessary to achieve management targets for the stock?
- Are there any priority gaps in research and monitoring that should be addressed or included?
- How are both plans taking into account the different habitats in the areas fished. For example, the differences between Humboldt/Del Norte areas vs. Sonoma/Mendocino counties?

### **Management Measure Effectiveness**

- Are the different management measures proposed effective at regulating catch?
- Are the measures and enforcement that CDFW has viable for dealing with poaching of red abalone?
- Will urchin culling in select areas restore the diversity of marine life and act as sanctuaries from urchins to repopulate the coast when conditions improve?

### **Additional Areas of Interest**

- Where does monitoring fit? While monitoring is likely addressed within many of the bins, I wonder if the subjects of data management and data sharing are included in the management plan?
- Concerns expressed that there is limited public trust in how CDFW has considered density in the past.

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# Terms of Reference

Red Abalone Fishery Management Plan  
Management Strategy Scientific Peer  
Review Process

2018

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CALIFORNIA  
OCEAN  
SCIENCE  
TRUST

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## **1. Introduction**

### **1.1. Management Context**

The northern California populations of red abalone support a very popular recreational fishery throughout northern California. While past landings (2002-2011) appear to be stable, recent declines in subtidal stocks have been recorded and the fishery is now closed. Red abalone has several characteristics, which make it vulnerable to fishing pressure and environmental fluctuations.

In 2005, the Fish and Game Commission (FGC) adopted the Abalone Recovery and Management Plan (ARMP), which governs the management of the recreational red abalone fishery and recovery of southern abalone stocks. This plan sets management guidelines and triggers for Total Allowable Catch (TAC) adjustments based on 2 criteria – density and recruitment. The ARMP has two phases of adaptive management: the interim management plan which the fishery is currently managed under, and the long-term management plan. The interim plan manages the northern California fishery as a single unit on a highly precautionary basis. The ARMP objective is to move the fishery into long-term management, where management is locally based, more responsive and adaptive, while maintaining sustainability. Management changes to the fishery in 2014 marked the beginning of this move to long term management conceptually by differing regulations between southern and northern areas of the fishery. The transition to ARMP long-term management provides an opportunity for the California Department of Fish and Wildlife (CDFW) to move management of the recreational red abalone fishery to a fishery management plan (FMP) under the Marine Life Management Act (MLMA).

A primary goal of fishery management under the MLMA is to ensure that fishing levels are sustainable and do not result in an overfished stock. Recent declines and concerns about changing ocean conditions have prompted the need for more information and a quicker management response, which the long-term management under an FMP seeks to provide for this fishery. FMPs assemble information, analyses, and management options that serve as a vehicle for the CDFW to present a coherent package of information, and proposed regulatory and management measures to the FGC. The FMP becomes effective upon adoption by the Commission, following their public process for review and revision.

Thus, it is important for the scientific underpinnings of the draft FMP to undergo external, independent peer review prior to submission to the FGC. This process is one way to provide FGC and stakeholders assurances that FMPs are based upon the best readily available scientific information, as set forth under the MLMA. The FGC and CDFW have asked for both the management strategy proposed by CDFW and a stakeholder submitted management strategy, led by The Nature Conservancy (TNC), to be included in the peer review. Each of the groups have provided an independently developed management strategy for consideration.

## **1.2. Review Process Goals and Objectives**

Ensuring the best use of best available information in fisheries management is an important tenet of the MLMA. The MLMA identifies external scientific review as a key tool to ensure management decisions are based on the best available scientific information. CDFW is committed to incorporating the best available scientific information into fisheries management through a peer review process.

Scientific and technical peer review (review) is widely applied across numerous technical disciplines to assure products are of high quality, reflect solid scholarship, and that the information contained is accurate and based on rigorous, sound scientific methods (OST 2016). In any review, Ocean Science Trust's (OST) intent is to provide an assessment of the work product that is balanced, fairly represents all reviewer evaluations, and provides feedback that is actionable. When building a review process, OST seeks to balance and adhere to six core review principles: scientific rigor, transparency, legitimacy, credibility, salience, and efficiency. These principles ground the review and shape the products that we develop.

As such, the goals and objectives of the FMP review process are to:

1. ensure that the science underpinning the FMP represents the best scientific information available and is appropriately used to inform a harvest control rule;
2. follow a detailed calendar and fulfill explicit responsibilities for all participants to produce required reports and outcomes;
3. provide an independent external scientific and technical review of the agreed upon sections of the red abalone FMP;
4. use review resources effectively and efficiently.

## **1.3. Review Coordinating Body: Ocean Science Trust**

Ocean Science Trust is an independent non-profit organization working across traditional boundaries to bring together governments, scientists, and citizens to build trust and understanding in ocean and coastal science. We empower participation in the decisions that are shaping the future of our oceans. We were established by the California Ocean Resources Stewardship Act (CORSAs) to support managers and policymakers with sound science.

For more information, visit our website at [www.oceansciencetrust.org](http://www.oceansciencetrust.org).

### **Contact information**

Errin Ramanujam, California Ocean Science Trust ([errin.ramanujam@oceansciencetrust.org](mailto:errin.ramanujam@oceansciencetrust.org))

## 2. Peer Review Scope and Process

### 2.1. Review Request

CDFW and FGC's purpose in asking OST to conduct a review of the scientific and technical components of both the CDFW and the TNC management strategy is to ensure the scientific and technical elements provide a rigorous underpinning for management decisions and regulatory action should they be implemented. Ocean Science Trust is serving as the review coordinating body, and worked with CDFW and TNC to develop a scope of review that focuses on key scientific and technical components of the management strategies where independent scientific assessment would add value (this document). Components subject to review were determined using criteria from OST 2017 ([here](#)).

### 2.2. Scope of review

CDFW is seeking an independent assessment of the red abalone management strategy developed by CDFW, as well as the stakeholder-submitted management strategy led by TNC.

The central question of this review is:

*Are the underlying data and analysis, and application of those in each of the proposed management strategies scientifically sound, reasonable and appropriate while also meeting the management goals for the recreational red abalone fishery in northern California as defined by MLMA?*

The review will focus on evaluation of the following components of both management strategies:

- Evaluation of the data collection methods that inform management indicators, triggers, and decisions including informing responses to changes in the environment, fishing, or other stressors.
- What is the scientific rationale for the indicators used and their link to responses in the abalone population?
- Is the proposed quantitative analysis and application of the data scientifically rigorous and is the scientific rationale for the proposed management actions it triggers accurate?
- Evaluation of modelling approach used including model assumptions, analyses, interpretation, and application of the model results to evaluate performance of the harvest control rules against management objectives.

- From a scientific perspective, provide a general assessment of the proposed methodologies including application, assumptions, and management implications of uncertainties in the stock status, data streams, and analytical method within the confines of CDFW capacity and regulatory authority

For clarity we note that this is not a comprehensive review of the entire FMP. Rather, we are reviewing only the management strategies submitted by TNC and by CDFW.

## **2.3. Process**

### **Review Process Overview**

- **Select a review mode.** A review process is selected in consultation with CDFW, Ocean Protection Council, and any other relevant groups (contractors, authors, etc.) by considering complexity, management risk, uncertainty, socioeconomics, level of previous review, and novelty (OST 2016; OST 2017).
- **Assemble review team.** Ocean Science Trust will convene a ~6 member review panel composed of Ocean Protection Council Science Advisory Team members and other experts (see “Assembling a Review Team,” OST 2016 and “assembling a review team” below for additional details).
- **Conduct review via a series of webinars.** Group webinars will allow CDFW and TNC to engage directly with reviewers at the outset to present the inputs, model methods, and application of analyses and provide two-way interaction to provide any additional clarity needed to complete the review. Many of the webinars will allow for independent deliberation and conversation among reviewers. Given the timeline no in person workshop will be convened.
- **Develop and share final report.** Reviewers will contribute to the development of a final report, which will be made available on OST and CDFW webpages.
- **Review process:** A single peer review panel will review both the CDFW management strategy and the stakeholder-submitted management strategy at the same time. CDFW, FGC, TNC, and OPC formally requested OST to conduct the review in this way. There will be one summary report will be submitted which covers both management strategies.

### **Review Mode: Remote Panel Review**

All meetings will take place via remote online meetings (webinars). At the outset of the review, OST will work with CDFW and TNC to develop detailed reviewer instructions that encourage focused scientific feedback throughout the process. Instructions will include directed evaluation questions and may delegate tasks for reviewers based on their individual areas of expertise. This document will be used to guide the development of meeting agendas and track progress throughout the course of the review. For each meeting, advance work will be required of participants (e.g. drafting responses to guiding

questions) in order for all parties to come prepared for meaningful discussions. OST will notify CDFW and TNC of additional requested materials and data immediately throughout the duration of the review.

#### **Webinar 1: Initiation of Review**

Ocean Science Trust will host an initial webinar to provide the review committee, CDFW, and TNC an overview of the scope and process, and clarify the roles and responsibilities of each participant. CDFW will also provide a summary of the relevant management context to ensure reviewers understand the role of the review in the larger FMP development process, and how the outputs will be considered. The bulk of the webinar will then focus on a presentation by CDFW and TNC of the scientific and technical components of each management strategy. This webinar is an opportunity to develop a shared understanding of the tasks and allow reviewers to ask CDFW and TNC any clarifying questions about the review materials or request additional materials before they convene independently to conduct their technical assessment.

#### **Webinar 2-3: Reviewers convene with OST to conduct review**

Ocean Science Trust will convene approximately two remote two to three-hour webinars with the review committee to conduct an in-depth evaluation of the components identified in the Scope of Review (above). In advance of each webinar, reviewers will be asked to prepare responses to guiding evaluation criteria questions specified in the review instructions. During each webinar, reviewers will discuss their findings and develop conclusions and recommendations within the context of these questions. Additional follow-up phone conversations may be scheduled as needed to complete the review. Outputs from each webinar, as well as reviewer responses to the questions, will guide the development of the final report.

#### **Webinar 4: Final summary report feedback**

Ocean Science Trust will host a final 2-hour webinar to gather final feedback and input from the review panel on the summary report. The review panel will be asked to review the draft summary report in advance of this meeting. This final meeting will provide a space for reviewers to voice any suggested edits or clarifications, and a chance to have a final discussion about results before sharing the final report with CDFW and TNC.

### **Assembling Reviewers**

#### *Transparency*

Reviewer names will be published on OST's webpage for the review at the outset of the review; however, specific review comments in the final review report will not be attributed to individual reviewers.

#### *Selection of Reviewers*

Ocean Science Trust will implement a reviewer selection process to assemble a review committee composed of ~6 external scientific experts. Ocean Science Trust will consult with and solicit reviewer recommendations from CDFW, TNC, the Ocean Protection Council Science Advisory Team (OPC-SAT), as well as OST's own professional network among the academic and research community. Membership may include experts from academia, research institutions, and government agencies as appropriate to deliver balanced feedback and multiple perspectives. Reviewers will be considered based on three key criteria:

Expertise: The reviewer should have demonstrated knowledge, experience, and skills in one or more of the following areas:

- ecology of invertebrates and/or red abalone
- fisheries science and management (e.g. HCR, TAC, management triggers)
- modeling for fisheries management use (e.g. Management Strategy Evaluation)
- invertebrate and/or red abalone population dynamics and indicators specific to understanding the response to environmental, fishing, and other stressors
- sampling and data collection methods for invertebrate and/or red abalone population studies
- statistical analysis methodologies

Objectivity: The reviewer should be independent from the generation of the product under review, free from institutional or ideological bias regarding the issues under review, and able to provide an objective, open-minded, and thoughtful review in the best interest of the review outcome(s). In addition, the reviewer should be comfortable sharing his or her knowledge and perspectives and openly identifying his or her knowledge gaps.

Conflict of Interest: Reviewers will be asked to disclose any potential conflicts of interest to determine if they stand to financially gain from the outcome of the process (i.e. employment and funding). Conflicts will be considered and may exclude a potential reviewer's participation.

Final selection of the review committee panel will be made by the OPC-SAT Executive Committee. Ocean Science Trust will select one member of the review committee to serve as chair to provide leadership among reviewers, help ensure that all members act in accordance with review principles and policies, and promote a set of review outputs that adequately fulfill the charge and accurately reflect the views of all members.

### **Transparency in the Review Process**



Once selected and shared with the CDFW and TNC teams, Ocean Science Trust will publish this terms of reference document to our website. OST will reach out to key communicators to share the website information and alert them to the review. Upon delivery of the final report to CDFW, the report will also be made public on the OST review webpage. OST will then host a webinar with key members of the review team to share results of the review with any interested stakeholders. CDFW and TNC may participate in this webinar at their discretion.

### Management Preview and OPC-SAT Endorsement

Ocean Science Trust will share the final summary report with CDFW and TNC for a preview before the review results are published and shared with the public. There will be an opportunity for CDFW and TNC to ask clarifying questions of the review committee and for reviewers to make clarifying edits only, as appropriate. This may occur via email, conference call or short webinar as time allows.

As a product of the OPC-SAT, near-final reports must go through a full OPC-SAT endorsement before public release.

## 2.4. Review Report (reference appendix template)

Ocean Science Trust will work with reviewers to synthesize reviewer assessments (responses to the review instructions and input during webinars) into a cohesive, concise final written summary report. This review summary will be delivered to CDFW by xxx 2018, and made publically available on OST's website. We acknowledge that reviewers may provide recommendations beyond the given reviewer charge; such recommendations will be honored and represented in the final summary as deemed appropriate by the review panel.

## 2.5. Timeline

The review will commence May 2018 with the expected delivery of a final summary report to CDFW by August 2018. A timeline of each task is provided below.

	April	May	June	July	Aug	Sept
Receive Draft FMP			June 1			
<b>Terms of Reference Development (April-May)</b>		X				
Develop and Finalize Terms of Reference	X	X				

<b>Assemble Review Team and Develop Guidance for Reviewers (April - May)</b>	X	X				
Develop/put up webpage		X	X			
Solicit, select, and confirm reviewers	X	X				
Schedule webinars		X	X			
Develop Review Instructions	X	X				
Develop webinar agendas		X	X	X	X	
<b>Conduct Review (June-August)</b>						
Distribute TOR, review materials, and Review Instructions to reviewers			X			
Kickoff webinar			X			
Webinar 2			X	X		
Webinar 3				X	X	
Final Webinar					X	
Additional data requests to DFW/TNC			X	X		
Develop outline and draft report, edits from reviewers					X	
Final draft to reviewers					X	
Final edits					X	
Management preview					X	
Final Report to DFW						X
Post final report on OST website						X
<b>Follow-up as appropriate</b>						X

### **3. Roles and Responsibilities of Peer Review Participants**

#### **3.1. Shared Responsibilities**

All participating parties share the responsibility in assuring adequate technical and scientific review of the Red Abalone management strategies in accordance with the MLMA.

#### **3.2. Reviewer Responsibilities**

The role of the review committee is to conduct a detailed evaluation of the scientific underpinnings of aspects of both the Red Abalone management strategies, where external review will be valuable. The specific responsibilities of the review committee are included in the Review Instructions. The review committee may request additional information, data, and analyses as appropriate to support a comprehensive and useful review.

The review committee chair has, in addition, the responsibility to: 1) provide leadership among reviewers; 2) ensure that review committee participants follow the terms of reference, adhere to the charge for the review, and review instructions and guidelines; and 3) promote review outputs that adequately fulfill the charge and accurately reflect the views of all members.

The review committee is required to make an honest and legitimate attempt to resolve any areas of disagreement during the review process. Occasionally, fundamental differences of opinions may remain between reviewers that cannot be resolved. In such cases, the review committee will document the areas of disagreement in the final summary report.

Selected reviewers should not have financial or personal conflicts of interest with the scientific information, subject matter, or work product under review within the previous year (at minimum), or anticipated. Reviewers should not have contributed or participated in the development of the product or scientific information under review. Review committee members who are federal employees should comply with all applicable federal ethics requirements. Reviewers who are not federal employees will be screened for conflicts of interest.

#### **3.3. CDFW and TNC Team Responsibilities**

CDFW and TNC will participate in the review process as follows:

1. Provide all relevant project documents, data, and supporting materials.

- a. Identify and provide all project documents, data, and other information necessary for reviewers to conduct a constructive assessment.
  - b. Work to ensure all related materials are clear and accessible to reviewers in a realistic timeframe and respond to additional requests in a timely manner.
2. Constructively engage with reviewers and OST staff, and respond to data and other information requests in a timely manner.
  - a. Engage in the process and be available to answer questions or present materials to the review committee as necessary.
  - b. Sonke Mastrup (CDFW) and Alexis Jackson (TNC) will serve as the primary contacts during the review process. In order to adhere to review timelines, CDFW and TNC will respond to and provide feedback on requested materials from OST in a reasonable, mutually agreed-upon timeframe.
3. Consider reviewer comments and recommendations. CDFW, FGC, and TNC intend to consider and incorporate reviewer feedback and recommendations into the management strategy for the FMP and supporting materials as appropriate.

### **3.4. Ocean Science Trust Responsibilities**

California Department of Fish and Wildlife, FGC, and TNC have requested OST to serve as the independent appointed entity to design and coordinate all aspects of this scientific and technical review. Ocean Science Trust will design and implement all aspects of the review process to meet management needs, including assemble and guide a committee of expert reviewers, conduct a review process that is on task and on time, schedule and host remote meetings as appropriate, work with reviewers to produce a written final summary report, and encourage candor among reviewers, among other activities. Upon completion of the review, the final report will be delivered to CDFW and TNC and made publicly available on the OST website for all constituents. Throughout, OST will serve as an honest broker and facilitate constructive interactions between CDFW, TNC, and reviewers as needed in order to ensure reviewers provide recommendations that are valuable and actionable, while maintaining the independence of the review process and outputs.

## **Appendix: Outline of Example Peer Review Report**

The following is an example template for a peer review report:

1. Summary of the Peer Review Committee, containing:
  - a. Names and affiliations of committee members
  - b. Topic(s) being reviewed
  - c. List of analyses requested by the Committee, the rationale for each request, and a brief summary the responses to each request

2. Comments on the technical merits and/or deficiencies in the applications of the analyses underpinning the FMP and recommendations for remedies. Comments should address issues such as the following:
  - a. What are the data requirements of the analyses underpinning the FMP?
  - b. What are the situations/stock status for which the analyses are applicable?
  - c. What are the assumptions of the methodology and/or in applying the proposed analyses?
  - d. Are the methodology and application of the analyses correct from a technical perspective?
  - e. How robust are results to departures from the assumptions of the analyses?
  - f. Do the application of the analyses take into account estimates of uncertainty? How comprehensive are those estimates?
  - g. Will the new analyses and application of analyses result in improved stock assessments or management advice?
3. Areas of disagreement regarding panel recommendations:
  - a. Among panel members
  - b. Between the panel and proponents
4. Unresolved problems and major uncertainties (e.g., any issues that could preclude use of the analyses underpinning the FMP)
5. Management, data, or fishery issues raised by the public and other representatives during the panel review
6. Prioritized recommendations for future research and/or data collection

# Box Crab Experimental Gear Permit Terms & Conditions, Permit Distribution

**Dr. Julia Coates, Environmental Scientist**  
**Fish & Game Commission, Fresno, October 17, 2018**



Andrew Lauermann, Marine Applied Research & Exploration



# History & Progress

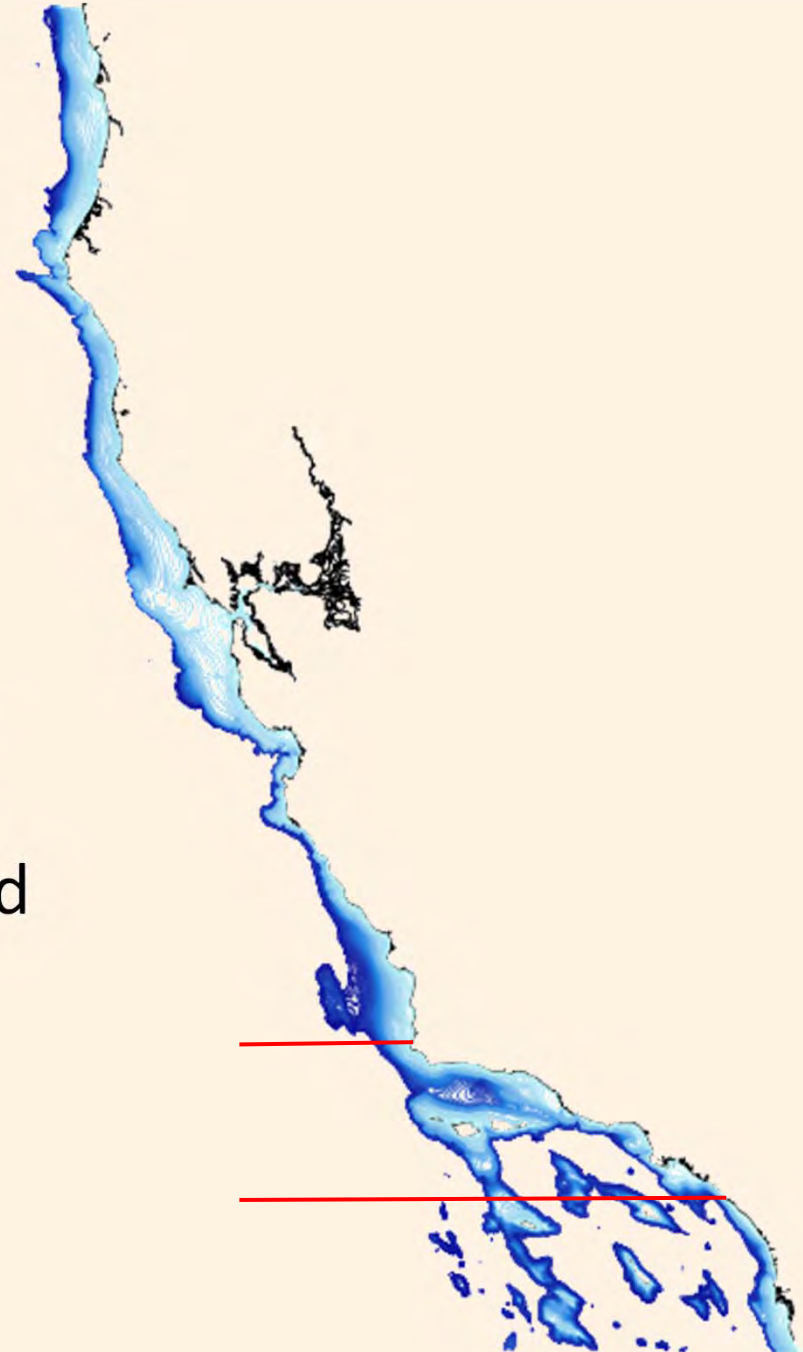
- Landings increases began 2014
- MRC discussions November 2017 & July 2018
- CDFW Director designated all non-Cancer crabs an emerging fishery April 2018
- Constituent meetings April & September 2018
- Regulation change to limit incidental take
  - Notice June 2018
  - Adoption today
- Development status:  
Terms & conditions, research, timeline





# Proposed Permits

- 8 Permits Total
  - 3 north of Pt Conception
  - 5 south of Pt Conception
- Southern permits distributed across 2-3 regions



# Recommended Terms & Conditions

- Observer coverage and installation of electronic monitoring equipment
- Permits valid for 1 year with up to 4 renewals
- Permits associated with vessel with  $\leq 2$  operators
- Permit fee
- Allowances, with restrictions, for multiple fisheries / trip
- Annual catch limit of 36,000 lbs/permit
- Size limit  $\geq 5 \frac{3}{4}$  in
- Service interval  $\geq 96$  hrs. Exceptions for weather or safety.
- Max 75 traps / permit. Possible additional allocations to meet research needs.



# Terms & Conditions Cont.

- Trap design specifications
- Follow best practices for avoiding mammal & turtle entanglement
- Buoy marking requirements
- No pop-ups
- Cooperation with domoic acid testing
- Fishing off San Clemente & San Nicolas Islands may be restricted
- Minimum of 50 fishing days per year
- Participate in all requested research data collection activities



# Catch Limit

- SoCal annual limit - 180,000 lbs
- Equal allocation of 36,000 lb for each of 5 SoCal permits
- Additional 36,000 lb for each central/northern permit
- Monthly limit is not required. Must accommodate experimental work & minimum of 50 fishing days.



Andrew Lauermann, Marine Applied Research & Exploration

# Catch Limit Approach

- Consider high and low end points of two biomass estimation methods
- Set a conservative catch limit that allows for ~ 50% video review
- Limit may be adaptive in subsequent permit years



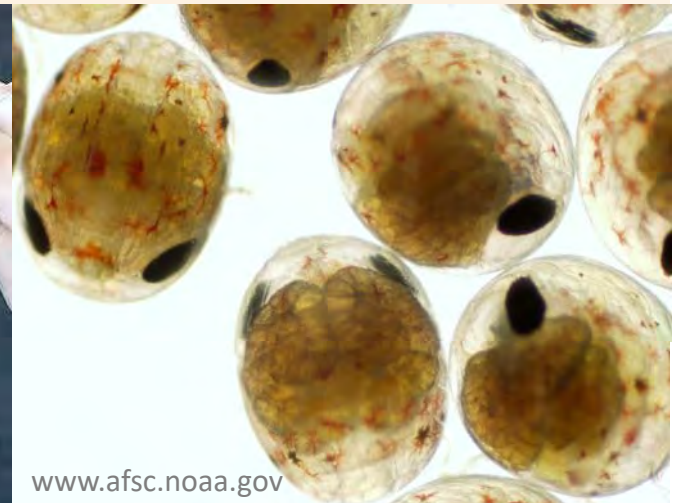
[www.fisheries.noaa.gov](http://www.fisheries.noaa.gov)





# Research, Funding & Collaborations

- Electronic monitoring – Ocean Protection Council (OPC), Pacific States Marine Fisheries Commission (PSMFC)
- Fishing/trap surveys – Fishermen
- Tag-recapture – Sea Grant, NOAA Saltonstall-Kennedy
- Collections & laboratory – Sea Grant, NOAA Saltonstall-Kennedy



# Electronic Monitoring

- No cost to fishermen, equipment to be returned to CDFW
- Goals
  - Bycatch
  - Catch (retained & discarded), size, sex
  - Develop automated image analysis software
  - Test two EM systems and human observers - provide guidance for potential broader implementation





# Costs

2 years participation

<b>CDFW</b>	<b>\$252,326</b>
Enforcement, Marine Region, License & Revenue Branch, Research Materials, Travel/Meetings	
<b>OPC / PSMFC</b>	<b>\$265,468</b>
Electronic Monitoring Hardware, Salary/Time for Data Analysis, Travel/Meetings	
<b>TOTAL</b>	<b>\$517,794</b>



# Costs & Permit Fee

<b>CDFW</b>	
Enforcement, Marine Region, License & Revenue Branch, Research Materials, Travel/Meetings	\$252,326
Subtract Marine Region Salary	- \$156,094
	\$96,232
Subtract contribution by Resource Legacy Fund	- \$25,000
	\$71,232
Divide by 8 permits per year for 2 years	<b>\$4,452</b>



# Permit Issuance

- Recommended requirements
  - Current invertebrate trap fishery permit holder
  - Vessel capable of carrying an observer
  - Agree to terms & conditions
  - Satisfactory review of compliance history
- Permit distribution
  - Interested fishermen submit written request to FGC by Nov. 1
  - Qualifications assessed
  - Preferred fishing region to be considered
  - Fishermen to be notified by Dec. 1
  - Request approval of permits at Dec Commission meeting



# Next Steps

- Submit permit requests to Commission at [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)
- Permits finalized at Commission meeting, Dec 12, Oceanside
- If not finalized in December, new statute applies
- Work with permittees to finalize research plans and specific fishing constraints
- Install electronic monitoring equipment and begin fishing early-mid 2019
- Contact: [Julia.Coates@wildlife.ca.gov](mailto:Julia.Coates@wildlife.ca.gov)  
805-730-1328



**CALIFORNIA FISH AND GAME COMMISSION**  
**REQUESTS FOR NON-REGULATORY ACTION 2018 - Current and Pending**  
**Revised 10-12-18**

FGC - California Fish and Game Commission   DFW - California Department of Fish and Wildlife   WRC - Wildlife Resources Committee   MRC - Marine Resources Committee

<b>Date Received</b>	<b>Name of Petitioner</b>	<b>Request category (Marine or Wildlife)</b>	<b>Subject of Request</b>	<b>Short Description</b>	<b>FGC Decision</b>	<b>Staff / DFW Recommendations</b>
7/16/2018	Jeff Crumley	Marine	Abalone/urchin impact from proposed expansion of Wheeler North Reef	Request that FGC engage in project review of proposed expansion of Wheeler North Reef associated with San Onofre Nuclear Generating Station (SONGS) decommissioning project, due to potential impact to two listed species of abalone (white and green) and damage to the sea urchin fishery. Provides report regarding concerns.	<b>Receipt: 8/22-23/2018</b> <b>Action scheduled: 10/17/2018</b>	<b>10/17/2018</b> <b>FGC:</b> DFW has a project with staff tasked to review and comment on proposed projects with potential impacts to living marine resources; FGC does not have sufficient staff capacity to review environmental documents for external projects.
7/24/2018	Ken Bates	Marine	North coast market squid research	Request for FGC to form a collaborative partnership (under Fish and Game Code Section 7056(k)) among three fishermen, three commercial fishermen's associations in Northern California, and DFW to collect essential fishery information for an enhanced status report (ESR) on market squid.	<b>Receipt: 8/22-23/2018</b> <b>Action scheduled: 10/17/2018</b>	<b>10/17/2018</b> <b>FGC:</b> FGC does not have a role in determining those collaborative research projects in which DFW engages. Encourage requestor to consult with DFW staff on this topic, and he has been in contact. No action required.  <b>DFW:</b> The enhanced status report (ESR) for market squid does not require new information; the ESR will use existing scientific information to help determine what, if any, new management or science is needed.
8/6/2018	Frank Oakes, Steller Biotechnologies	Marine	Giant keyhole limpets	Concern that industry practices may be impacting giant keyhole limpet; request FGC to assist in reviewing/clarifying harvest management regulations, policies and guidelines due to vulnerability of the species.	<b>Receipt: 8/22-23/2018</b> <b>Action scheduled: 10/17/2018</b>	<b>10/17/2018</b> <b>FGC:</b> Refer to DFW for evaluation and recommendation.
8/22/2018	Chris Voss	Marine/Wildlife	Split scope of FGC responsibility	Recommends separating FGC into a marine commission and a terrestrial commission. The current structure is a firehose of information.	<b>Receipt: 8/22-23/2018</b> <b>Action scheduled: 10/17-18/2018</b>	<b>10/17/2018</b> <b>FGC:</b> No action recommended at this time; dividing the commission into two bodies would require an amendment to the California constitution.
8/22/2018	Jocelyn Endevoldsen Heal the Bay	Marine	Lobster Advisory Committee lessons learned	Request to present outcomes of lessons learned report for DFW Lobster Advisory Committee process, derived from a survey of stakeholders involved in the process.	<b>Receipt: 8/22-23/2018</b> <b>8/22/2018: Scheduled for briefing at November 2018 MRC meeting</b>	<b>10/17/2018</b> <b>FGC:</b> No further action is necessary.

---

**From:** Jeff Crumley <  
**Sent:** Monday, July 16, 2018 10:09 AM  
**To:** Mastrup, Sonke@Wildlife; Shuman, Craig@Wildlife; FGC; Ashcraft, Susan@FGC; Jeremy Prince; Kashiwada, Jerry@Wildlife; Taniguchi, Ian@Wildlife  
**Subject:** SONGS / White & Green Abalone / Urchin Fishery  
**Attachments:** hy7.jpg; hy3.jpg; hy2.jpg; WNR Analysis Report.pdf; WNR Questions.pdf

Greetings Folks,

I am Jeff Crumley, urchin diver at Capistrano Beach. I am writing you today to bring attention to the SONGS decommissioning project and Wheeler North Reef.

I wrote an analysis report on the proposed expansion of Wheeler North Reef (WNR). I presented this report to the involved parties and at the WNR meeting on April 9, 2018. The damage caused by the operations of SONGS pales to the damage caused by WNR. The corruption and actions exposed in my report violates the Coastal Act and has caused irreparable damage to the urchin fishery. I have attached my report and the questions that need answers.

Secondly, The proposed extraction of the pipelines servicing SONGS must not be allowed. The DEIR has been published for public comment. I am writing my comment to this that presents two main reasons to squash any idea of touching the marine environment.

1. - The DEIR fails to recognize, in its ESA considerations, two species of abalone...Whites and Greens. I have also attached a photo of two threaded and one white that I found at San Onofre recently. There is also an emergent population of green abalone that was shown to Nancy Caruso.

2. - The proposal would destroy the existing urchin fishing on the pipeline.

The reason for WNR was mitigation. The urchin fishery was descibed in the EIR but, excluded from this and the application of WNR to prevent urchins goes against the claimed mitigation. The amount of acreage taken from the urchin fishery keeps increasing. You folks must help me help our resources. This is out of control.

Please arrange for further investigation into my claims...I can prove everything I say.

Thank You for you immediate attention,  
Jeff Crumley

--



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# Wheeler North Reef

Review & Analysis Report

By Jeff Crumley / Commercial Sea Urchin Diver  
Capistrano Beach, CA.

## Table of Contents:

### Introduction

1. Reef design
2. Outlying reefs & Beaches
3. Mitigation of resource
4. Monitoring
5. Summary
6. Recommendations
7. Discussion

*(This report is incomplete due to the time allotted and the insurmountable information to be digested in this short period. The information presented here is intended to instigate a complete review of this project and seek an equitable solution)*

# Introduction

Wheeler North Reef has failed.

The failure is not only of the reef. The failure is also the erosion of public trust, degradation of the environment and produces scepticism of science.

The failure determination is a result of decades of research, planning and execution. Wheeler North Reef (WNR) is one of the largest and most studied artificial reefs (AR).

This project is in violation of permit 6-81-330-A with conditions (permit), Environmental Impact Report (EIR) criteria and the Coastal Act as a result of the failure designation, since the execution of the design. There is discrepancy in the language of the EIR and permit.

How and Why WNR is failing may seem complicated. It is not. All things are better understood in retrospect. This report explores the cause(s) of failure by analysing the history and sciences along with the purpose and directives prescribed in the permit, the EIR and the Coastal Act. It utilizes my personal observations and investigations to apply logic, reality and pose valid questions and hypotheses.

Is Wheeler North Reef actually a failure? I suggest it's just a stones throw from perfect.

*"Time will tell" ... and, it has.*



# 1. Reef Design

Some key examples of AR literature were presented and compared at the Third International Artificial Reef Conference (IARC) in Newport Beach, CA. 1983 (of which Professor John Stephens was on the steering committee).

The criterion for AR's is highlighted on the cover of the program from this event and is threefold...

## **“Engineering Design, Biological Research and Productivity.”**

The reality of WNR does not meet the criteria. There is a plethora of research, a deficit of productivity, caused by a flawed design.

Identifying how things went awry... There is ample evidence that show beyond question the reef design flaw was in application. The focus drifted.

Social interactions between scientists throughout the history of the project are paramount to understanding the arbitrary nature of decisions made in the planning and execution of WNR. These interactions are often a window to the truth. I corresponded with John Stephens and spoke with Jake Patton (March 2018).

Jake Patton, WNR designer and part of John Stephens team, had suggested the best way to grow a sustainable kelp bed was on low relief reef near existing kelp. Kelp does not grow well on top of reefs rather, around the high spots. Being in the vicinity of existing kelp promotes sustainability through recruitment.

Stephens on the low relief concept - *“I have always thought that the low reefs were a bunch of crap even though it was first championed by one of my guys.”* - referring to “Jake the Diver.”

One flaw in the design was not enough consideration for the associated biota. Professor Stephens stated - *I didn't think the idea was great but other's picked it up and ran with it. My work was always in high relief because that's where there was abundance and diversity of fishes.*

Jake Patton said he - *“designed the reef to be placed on hard substrate, sand/silt is the wrong material.”* - Jake’s solution is to move the reef...*“It was built in the wrong place, there’s no fish there. I think it needs to be moved... but, that won’t go over very well.”* Jake said... *“I never saw it after it was built.”*

Design and placement is very difficult due to the affected area at San Onofre being ancient riverbed (cobble). Cobble stones are small, smooth, round stones that fit together in a way that creates a unique habitat. The cobble at San Onofre is vast and consistent as is the complex ecosystem that resides within.

Construction materials, sunlight exposure and current are determining factors to how species can establish themselves. The difference in surface texture will dictate which species of algae can attach themselves. Light exposure and current affects the density and columns of algal turf. The reference reefs at Mateo and Barn display this. It is described in detail about Pendleton AR - (Carter, ET AL).

The literature presented at the IARC clearly and unanimously identifies location and design as critical factors for an AR to be successful and long lived. Eight mitigation alternatives were proposed (as shown in permit excerpt below). The preparations were detailed and there was plenty of published literature to form a basis.

*Permit -2.7 Alternatives That Avoid Or Lessen Impacts Section 15126(d) of the CEQA Guidelines,*

*The Draft PEIR considered eight alternative experimental and mitigation reef proposals, which were suggested through the PEIR scoping process. These included alternative locations for the artificial reef, alternative designs, and decommissioning of SONGS. **Five of these alternatives were not included for evaluation because they did not meet the SONGS Permit project objectives. These included: 1) an alternative reef site north of San Clemente Pier; 2) an alternative reef site farther offshore from the proposed project site at San Clemente; 3) compound reefs at Big Sycamore Canyon; 4) a kelp planting alternative; and 5) decommissioning SONGS.***

Some scientists in this project determined that thin sand over bedrock was the preferable substrate for performance. This design was described as a “Rock-N-Roll” reef whereas seasonal conditions would cause sandblasting and rolling rocks to prevent “undesirables” from overpopulating the reef. This was a controversial approach but, again, others ran with it. The prospective sites were determined by sonar survey which cannot determine subtle differences in sand constitution. The persistence of a low relief design on silt sediment bottom inherently created a flaw.



There are different types of sand. Typically, the further from the beach, the more silty/muddy the bottom becomes. This characteristic is well defined in the geography of south Orange County. The “kelp line” follows the “mud line.” This silt sediment has different characteristics than the clean, gritty, flowing sand flats that migrate with tides and seasonal conditions found up to and upon the beach.

WNR sits just outside this natural line on mud, in around forty-five feet of water. There is no sand to blast and no rocks to roll. There is virtually no water action that could induce this activity even if the elements were there.

The geographical characteristics from Dana Point to Oceanside are consistent. We have the Capistrano bight with San Mateo being the southern boundary ( this area is unique and discussed later in “Outlying Reefs and Beaches.” ).

The design consists of multiple polygons of modules. They are inconsistent in design and interspersed. The rocks are scattered about in random, as one would expect from being dumped from a barge and falling 40-50 feet to the bottom. There is a center pile with rocks landing outward in singularity.

These modules have no connectivity. They are basically islands. Pendleton AR is actually a great example for this as the modules are connected by cobble pathways. Pendleton is a sophisticated design. Recent observations show diversity of species discounted in some previous literature. Some thought it “died” and no longer worked. Diversity, reproduction/recruitment are observed.

The majority of acreage at WNR lacks habitat for fish to reproduce, hide, or grow up...no relief. There are more hiding places in cobble than on WNR. On the same note, this means less food available. The elephant in the room is the high relief module(s) in WNR that are probably carrying the entire reefs ecological assessment. If the whole reef were built like these we wouldn't be talking about this.

The placement of WNR has been described as acceptable because of it's close proximity to existing natural reef (San Mateo kelp bed). Up to a point, there was no mention of Barge rock. Barge is a couple hundred feet south of the southernmost border of WNR. This was unknown to the scientists until Ken Nielsen educated them. Barge, too, has some medium relief and has the same characteristics as Mateo and Barn.

Another indicator of a flaw is the close proximity of WNR to Barge rock. Barge represents the northernmost edge of the ancient remanence of San Mateo Creek (cobblestone). WNR begins on the adjacent soft bottom. Overflow of fish would better occur if habitat would allow. Observation doesn't match the data.

The issue with reef location is ecological geography. There is a distinguishing pattern to the ecosystem that is governed by geography and the expectations/predictions for WNR don't fit the location. A square peg will never fit a round hole.

## 2. Outlying Reefs & beaches

Nature will follow her own rules.

Long term observations raise questions that can only be answered through the scientific method. Do we know about the nearshore resource loss?... possible causes?... Effects of sand flow and current on natural reefs?... Geological transformation?... Changes to the trophic cascade?

There are several natural reefs nearby and inshore from WNR. West Reef just to the north of San Clemente pier, Seal Rock, Rudies Garden and the inside cobble at Nixon's. These reefs *were* outstanding specimens. They were biodiverse and prolific. We have harvested urchins from these reefs for decades

There has been a sand issue in San Clemente since 1983. Has WNR had any effects on current and sand distribution to exacerbate the existing issue?  
I suggest it has, greatly.

These reefs began to change around the time of construction of WNR. The placement of the rocks increased turbidity, transporting muddy sediment. We didn't start diving there again until 2013. Life on these reefs was fading by this time. The kelp canopy on WNR had become magnificent. Sand was beginning to claim the natural grounds. The whole geography and environment had changed.

These observations raise questions that form some testable hypotheses. One of these questions was put to Patrick Tennant at his San Clemente City Council meeting Powerpoint presentation, October 2017. Steve Swartz asked if the reef would increase the shark presence. Tennant said they haven't seen an increase in sharks. We should be reminded of the shark activity over the last couple years. Tennant's response is

misleading at best. There are no studies on this and there is only one correct answer..."We don't know."

This is where a great hypothesis is created...

*"Does WNR affect the ecological geography which causes changes to the trophic cascade whereas juvenile white sharks have become more common because sand flats have increased and attract larger swarms of stingrays?"*

This would be a valuable study for Dr. Chris Lowe to conduct.

Another question posed is... *"What are the effects of WNR kelp canopy on sand deposits/accumulation that have gathered from Mateo to north of the pier?"*

Yet another..."*Did the kelp canopy at WNR prevent zooplankton from propagating to the inshore reefs contributing to their demise?"*

I spoke with Dr. Lowe regarding my observations. Not only did he agree on the merit of my hypothesis and the need to test it, he said he has been trying to work with the project through Kim Anthony. She is no longer with the project/Edison.

I have recorded red sea urchin harvest from WNR. This harvest occurred between Aug. 2015 and Dec. 2016. There were no urchins on WNR before this period. As I harvested, I noted there was no recruitment. All of the urchins I observed were mature. This time period is when the El Nino event laid waste to everything out to 45+ feet in depth. WNR withstood some of this devastation. I suggest these urchins were the refugees of the population from the inshore reefs.

I sent an email to Steve Schroeter in an effort to communicate my observations. He seemed surprised that I had urchin landings from WNR. Steve abruptly ceased communicating when I expressed my concerns and asked for some understanding of the monitoring method. The event of harvesting urchins on WNR wasn't supposed to happen. Were the monitors aware of the urchins or me harvesting them?...I picked over 6,700lbs in this period, right in front of them.

The relevance, function and value of sea urchins and the sea urchin fishery is understated and under-represented in this project. This goes against the spirit of the project and the Coastal Act.

### 3. Mitigation of Resources

*Seems the only resources benefiting from this project are kelp, lobsters and the money from Edison's customers going to science. Science is not a natural resource.*

The design was directed to consist of like biota of the affected area. San Onofre kelp beds are an urchin hot spot. There is contradiction in the permit.

*Permit - 4.0 CONSISTENCY WITH THE COASTAL ACT ..."Moreover, giant kelp provides habitat and food for a diverse assemblage of animals, many of which also have high biological and economic importance. For example the red sea urchin fishery is one of the largest fisheries in California and is critically dependent on abundant kelp, which is the primary food of red sea urchins. "*

. Yet, in the permit/ conditions- *' important functions of the reef shall not be impaired by undesirable or invasive benthic species (e.g., sea urchins...'*

The sea urchin resource and fishery meet the criteria for "Special Significance" as described in the Coastal act chapter 3 section 30230. In section 30234.5 the economic, commercial, and recreational importance of fishing activities shall be recognized and protected.

The EIR listed a group of parties contacted. Fisherman, ENGO's and land based constituents but, no urchin divers. The California Sea Urchin Commission is a State entity under the Dept. of Agriculture. Was there no intention of including the urchin fishery in the design?

Steve Schroeter is an expert on sea urchins and the urchin fishery. He knows the vital role urchins play in the ecosystem as well as their potential devastating effects. This just adds more scepticism to the reasoning behind some decisions that were made.

The urchin fishery information used was the CDFG urchin landing receipts from block numbers. These blocks encompass several square miles each and provide no local data. I have daily log books that identify "dive spots" and pounds harvested. We know the bottom better than most. Our profession requires keen observing... "Fisherman's Ecological Knowledge." This is the inherent instinct from ancient hunter gatherers applied to quality and conservation. Science seems to exclude this expertise too often.

## 4. Monitoring

The decision for multiple individuals to avoid communication speaks volumes. I have simple, logical questions that need answers. In appearance, the monitoring method is a linear accumulation multiplied by acreage. Why?...the modules are circular and three dimensional.

I see the habitat and populations on the mods as a bullseye target. The yellow center of the target being the most habitable and productive. The red, blue and white rings being successively less habitable and populated. Seems a linear survey doesn't fit.

Monitoring is mentioned in the EIR, permit and described at length in *Compliance and Similarity Determination, CCC, Reed, Schroeter, ET AL-2007* is a hybrid methodology consisting of two statistical methods It is sold as a holistic form of assessment with broad allowances for the unknown.

This is a quantitative statistical method. In this mitigation project, the purpose is to enhance the marine environment. I argue that this method is insufficient. The importance of compliance to the Coastal Act reads as the need for a quality environment. There is a need for qualitative assessment. Quantitative and qualitative are symbiotic.

The lack of communication leaves us kind of incomplete here. So, I'll just list some questions and add to it as I proceed.

***Monitor report - (note undesirables in PowerPoint)...***

[http://marinemitigation.msi.ucsb.edu/documents/annual\\_review\\_workshops/artificial\\_reef/2017/2017\\_arw\\_performance-wheeler-north-reef.pdf](http://marinemitigation.msi.ucsb.edu/documents/annual_review_workshops/artificial_reef/2017/2017_arw_performance-wheeler-north-reef.pdf)

### Questions:

1. How does the report justify performance standard success of “undesirables” when I picked 6,700lbs of urchins? Does the fish count need to be changed? Does this add to the failure?
2. Did the monitors even know of these urchins?...Schroeters surprise indicates not.
3. Where are the specs on transect lines?
4. Are transects on every module?

5. What modules are surveyed?
6. Where are the specs on reference reef transects?
7. Habitat for benthic species is dissimilar, were the trophic needs addressed?
8. Are Moon snails undesirable and what is the effect on the trophic cascade?
9. Why no urchins when they are a majority of biomass at SanO and vital to reef biota proliferation?
10. Is the entire water column counted?
11. Why are some species discounted? (black bass)
12. What species are counted?(lobster, moon snail, clam)
13. There seems to be some confusion as to what the public sees as 28 tons of fish biomass and what is actually considered...explain?
14. The monitoring is a hybrid of quantitative measurement, shouldn't qualitative assessment be used also?...aren't they "codependent?"
15. The relative performance standards do not match observations...where is this data?
16. Can transects be arranged in a way to cherry pick the most productive areas to compensate for the majority of the reef that is far below expectations?

## 5. Summary

Wheeler North Reef design and application was perverted by others. Jake Patton's design was placed on unsuitable soft substrate (mud) and is preventing achievement of the designs intended goals. Jake designed this reef to be on hard bottom. Who changed this?

The process for location was now flawed. The ecological geography at WNR was poorly assessed. From the setting in mud, to the possible effects on the surrounding environment. The trophic needs could never be achieved with this design on this bottom at this location.

Now the intention is to expand the reef, as permitted, if needed. It isn't needed. The proposed expansion is to be located on acreage that was deemed unsuitable in the permit. How is this possible? What has changed?

The success of existing high relief mods on WNR are proof of the need for high relief...not expansion.

The observation of collateral damage to the surrounding environment overwhelmingly suggests the need for immediate study. The amount of research done on this project leaves very little wiggle room for random explanation and creates a higher expectation for results.

The effects of the kelp have created a lagoon of sorts. The inside area from Mateo to the pier performs like an eddy accumulating sand. The massive kelp canopy acts like a curtain and prevents species proliferation. The inshore resources are dead.

The lack of consideration and involvement of the sea urchin fishery is not only a violation of the Coastal Act but, goes against the spirit of the project... mitigation. My resource loss from SONGS has doubled with WNR. Adding the recent marine protected area in Laguna, I have lost 40% of my range. This is unacceptable and must be mitigated.

Looking at this as a whole, indications are that there is more focus on having the biggest reef in the world than on the needs of the environment. The pattern of conduct by the scientists on this project paints a picture of arrogance. This is a public trust. The numerous violations and disregard for rules and the environment is unacceptable.

There is way too much AR literature and precedence to accept the mistakes that were made and the solution for this is too easy. The indications of ethical misconduct must be considered with the understanding of the people involved. We're not dealing with dummies so there is no excuse for the events as they have unfolded. How many of the people have been diving on this reef? It doesn't look like what most think.

WNR is virtually unseen by the people, making it of the metaphysical. People only see a huge floating kelp canopy and imagine a BBC documentary of pristine Channel Islands kelp beds narrated by David Attenborough.

***-" fate and metaphysical aid doth seem to have thee crown'd "  
—William Shakespeare***

There are serious implications as to the oversight and compliance on this project. There needs to be an inquiry. The permit must be reviewed. This project needs some new blood and needs to include the urchin diver.

At this point, economic concerns are trumped by environmental and legal requirements.

.



## 6. Recommendations

### Equitable Solution

The reason we are at this juncture is because this project has failed. The cause is evident. Science must examine results, observations; deficiencies, trophic needs and apply deductions to a solution adapting a species specific engineering plan.

The solution proposed would provide a satisfactory result and a solid plan for the future. Of the four parties affected, The Environment, Community, Edison and Science, only science has benefited. With this proposed solution, Edison will achieve mitigation; biological research will expand; community will receive benefit; the Environment will suffer less negative effects.

My understanding of the local environment allows a unique vision. The ecological geography is key to understanding how things work at this location. With what has already been done, there is a simple solution.

Placing medium size rock strategically throughout the existing modules creating high relief in some areas and smaller rock by areas of existing high relief creating connectivity. Ultimately creating a consistent/connected substrate conducive to the habitat needs and giving consideration to the trophic needs.

The obvious questions are economics and effect on existing reef. This alternative may be more time consuming and require more material. Care of existing reef would surely be a factor.

## Discussion

I am neither a professor or an investigative journalist. So, I'm gonna throw a twist on this report. This chapter is what the circumstances and my thought provoking investigation produced... questions and awareness. The reader, where applicable, should take note of a relevant point of view....public perception.

As usual, with the more I read, the more questions I find. I've come to the suspicion there is something more motivating to this project than is observable to outsiders. It doesn't pass the smell test. Science is s'posed to be the quest for truth, knowledge and understanding. This is a big deal. It defines us.

---

*The following text is my search process to this point. This job isn't complete. It's a mix of copied text and my content. This is unabashed. If you don't get it, It doesn't matter... it isn't for you then. If it does ring a bell, maybe it will spark the dialog that needs to happen. There is a social problem, lack of communication and humbleness has society paralyzed.*

### Metaphysical aid

*WNR is virtually unseen by the people, making it of the metaphysical. People only see a huge floating kelp canopy and imagine a BBC documentary of pristine Channel Islands kelp beds narrated by David Attenborough.*

***-" fate and metaphysical aid doth seem to have thee crown'd "  
—William Shakespeare***

### Public Resource

*Coastal Act clearly understands and expresses public resource and public participation. The CCC, SLC, UCSB, WNR and every entity under the state of California including the State itself is "Of, By and For the People."*

***\*\*Who determines public involvement / participation and to what degree?***  
*I am a stakeholder in this project. I am more than just a concerned member of the public. I have reached out to SLC, Schroeter and Tennant. SLC (Chris Beckwith) was very nice on the phone and seemed concerned but, deflected to CEQA process. Schroeter engaged in 1st email then, cut off contact when I took him up on his offer to*

*discuss my issues (by this time he prob saw my CEQA comment). No response from Tennant but, Kim Anthony responded cordially on LinkedIn informing she was no longer with Edison and would pass along my inquiry to them.*

*Contrary to some popular agenda driven opinions, Man is a natural part of the ecosystem. Man is an animal and consumes animals. He is part of the trophic cascade. He is as much of the marine trophic dynamics as many other marine animals. This is documented in the historic record.*

### *Oversight*

*So, SCE wants nuke plant and needs enviro OK.  
CCC determines mitigation due and creates vehicle for facilitating*

*The CCC hires its own scientists to steer project seeming to use best science. UCSB scientists are successful in creating worlds biggest reef. SCE raises rates and consumer foots bill. Science has perpetual research tool and fame. SLC and CCC cover the oversight and run roughshod. Reef failed and...well...just double it!!  
This is playing out like a racketeering charade*

*Edison is being touted as the responsible party, spending millions and making things right. This may appear true but, obfuscates reality. Mitigation becomes a term of art and assumes a different profile. Edison meerley raises rates a couple pennies and overnight has millions and no one knew the difference. (Credibility, Ethics and Common Sense).*

*The profits for science and politics seems to be the only benefit here. SCE scores points for "attempted" compliance, CCC and SLC score points for authoritarian oversight and environmental protection while UCSB scores points for cutting edge research with an added bonus of perpetual resources for studies and grad student thesis material to aid in the exponential accumulation of redundant scientific verbiage.*

*Nullification.*

*EIR and permit "have enacted allowances which either nullify the Coastal Act or render useless any attempt to enforce it,"*

*Over time nature tends to correct itself, so does science.*

*The EIR sets guidelines but seems to exempt, under circumstances, any actions that violate the permit and Coastal Act\*\*Check the EIR for double standards... The EIR*

*seems to be a big bag of "CYA." The SLC has attys. Listed as contacts on the website right next to admins....HMM?*

*The mechanism for oversight is supposed to be the EIR and the permit. In fact these clear a path for violating the permit and Coastal Act. This creates a scenario of perpetual failure.*

*\*\*Independent survey? Just exactly who is independant? Seems to be a relationship with CCC and UCSB / Reed & Schroeter...Nepotism?*

*The perception is... OK, here's the rules but, they only apply on paper and, were gonna do what we want. We'll justify/explain away in retrospect with verbiage vomit.*

### *Expansion...Carrot and a Stick*

*Lessons Learnt...*

*The perception of a carrot and a stick are overwhelming.*

*Research needs to be refocused and reconfigured to correctly match observations.*

*It now appears this project has reached a state of "Paralysis by Analysis." Studies that require studies to do studies upon studies with no end in sight and still a "Frankenstein" sitting on the ocean floor that no one but me seems to be aware.*

*Schroter is an expert on sea urchins and urchin fisheries. Where was his expertise in the design phase? As an expert, he knows the pros & cons of urchin populations and the vital role urchins play in reef productivity.*

*New expansion would occupy acreage of **alternative 1. Five of these alternatives were not included for evaluation because they did not meet the SONGS Permit project objectives.***

*An article published in the San Clemente Patch 2013 ...." - Schroeter said the team will do more analysis this year to try to understand why the reef isn't home to more fish whether its a natural phenomenon or some flaw inherent in the reef design.*

*"We will monitor Wheeler North much as we did last year," he told the crowd of about 50 people at the Ocean Institute. "We will conduct analysis to try to understand why the Wheeler North Reef consistently fails to meet the 28-ton fish biomass standard." -" This is a redundant talking point seen in multiple media articles.*

*If science desires to repeat the same, they must have looked at it, right?. What did you look at? If you're repeating the design, it must be OK, right?*

*To proceed with expansion. What/where are the applied studies that brought you to arrive at this decision?*

*The acreage affected in both SONGS and WNR now total 332+ acres (with the potential of more if the inshore reefs are considered). The new proposal by SCE adds \_\_\_\_ acres. This would consume a total of \_\_\_\_ acres.*

*The conditions, permit, monitoring and standards should have been set by statistical expectations from observed data. If this is the case, the failure of WNR appoints the acreage of the mitigation reef to the affected acreage at SONGS site. Thereby making it necessary to mitigate the mitigation reef. This is not possible with the proposal to expand. We now have the expectation for expansion acreage to mitigate the failure by the same failed standards and meet the standards of a now increased affected area. Simply put, it is expecting less acreage to produce better results by the same failed plan.*

*Falsifying the monitoring method as cherry picking produces a science conundrum. If method is falsified, science is forced to concede high relief as proven successful alternative. I question the monitoring method because of the species distribution and inconsistency of the modules. I want to see the data and compare it to my observations. At this time, I reject the monitoring data. I suggest the data does not represent the total acreage. Were mods counted individually or as a whole?...Individually they can be assessed by relief comparison. As a Whole, indicates higher relief compensating for low relief and skewing reality. Qualitative assessment is lacking. The linear method must be triangulated to form a 3D method by adding qualitative.*

*I would go as far as describing some of these modules seemingly barren excepting for kelp. I'll go even further and suggest the performance standards assessment is overvalued by as much as 30% (observation opinion).*

*#showthefishcount I just don't see it...show the evidence. #openscience*

*Ask someone about my "bullseye" monitoring theory...someone must have thought of it before.*

### **Ethics & Irony**

*- John Grant (CDFG) was also on this IARC steering committee. Grant initiated a confrontation with a guest of John Stephens at this symposium. Grant was perturbed that Stephens brought a member of the public (my teacher) to the event and tried to remove him. Grant was quoted as saying "the public shouldn't be allowed in here."*

*- Dr. Rimmon Fey worked on this project. He refused to sign onto the EIR without a disclaimer...Why?*

*\*\*If a hypothesis fails a test, it cannot be true, and it must be modified or discarded. In science, if there is a conflict between observation and hypothesis, the hypothesis loses. It doesn't matter whose hypothesis it is or how famous they are - if the hypothesis does not conform to reality it must be rejected.*

*Research must then be refocused and reconfigured to correctly match observations. That's how science is supposed to work.*

*What if two or more competing hypotheses both pass some initial tests - how do you choose between them?*

*Certainly, if the hypotheses generate different predictions it will be a simple matter to pick the best one - as long as it is feasible to carry out the experimental tests. What if the competing hypotheses don't give distinguishable, feasible predictions?*

*Enter Occam's Razor.*

*"Entities are not to be multiplied beyond necessity."- Doubling the reef will only meet the needs of quantitative statistics. You will still have an imbalance and incomplete ecosystem.*

*"The essence of dysfunction is to proceed against the basic laws of science. Empirical evidence is also required."-*

*"Scientists must use the simplest means of arriving at their results and exclude everything not perceived by the senses." - Ernst Mach*

*A good scientist will lay his work down to be tested.*

*Duplicity.*

*Nowadays, there is a struggle in the purity of science with financial needs and social desires seemingly taking precedence over truth and reality. This is made easier by the developed technical jargon that obfuscates the simplest of concepts. Science has been an elite group throughout history.*

*The evidence here seems to point toward "Adventures in Ethics and Science"... a very popular science blog that has a way with words and is worthy of dissemination...*

*- " Scientists are engaged in an endeavor where they're trying to figure out **what the data show** about the world, not just **what they want to see** in their experimental results. Ideally, scientists are making sure their data and conclusions can stand up to the toughest objections they can imagine being raised *before they even send their manuscripts off to the journal.* And, to the extent that*

science is a knowledge-building project where scientists need to be able to depend on the results communicated by other scientists, they know they should be striving for scrupulous honesty and utter clarity of language. Irony is not a literary device that ought to be getting a lot of use in scientific communication.

And yet, part of what drives the “humor” in the “translation guide” is that there are scientists who *do* engage in ... what to call it? Putting the most favorable spin on their results? Stretching the meanings of the words as far as they can go without engaging in outright lies? It’s not the kind of thing in which scientists are typically proud to engage, but when an experiment is being particularly cranky in year 7 of a graduate program, one can imagine that it might be a better option than saying, “I’ve got nothing.” And certainly, one suspects that *other* scientists are engaging in scientific puffery.-

**Janet D. Stemwedel** on July 10, 2007.

*To what end?... Enough is Enough.*



## Reef Design

1. A PhD is disagreeing with me that the reef is a failure. It is by definition but, tell me why then, is expansion necessary?
2. Edison protested size down. Now, science failure must double size, back to original. Looks fishey!!
3. How is pier north now acceptable? A: nearby kepl from WNR...
4. Why was reef set in mud? A: keep urchins off
5. Why was Jake's design set in mud? Jake's not pleased
6. Is there a count on how many people have said high relief? (warnings not heeded)
7. Expansion...so, reef must be OK, proven success, Schroeter said look maybe, if all is good why expand?
8. Who told Tennant "edge of ocean where fish are?"
9. Why is weight scienced when it's on bedrock?
10. Kelp seems too thick...sunlight, benthic ecosystem?

## Outlying Reefs

1. What are you going to do about the inside reefs, geological transformation?
2. What about the sand?
3. Are you going to study the shark situation?

## Mitigation

1. Urchin fishery used in sales job...where's the mitigation?
2. Urchin fishery excluded from planning, why?
3. Affected area now doubled...mitigation fail?
4. Urchin fishery has lost...Harbor, SONGS, MLPAL, WNR...Now this threatens Christmas tree/Poche

## Monitoring

1. When I'm picking urchins...cloud of fish indicates biomass while showing food chain and species. Don't I actually see more?
2. Where does qualitative assessment fit in?
3. Lots of species missing and some sand species mingling with reef species...what is the effect on trophic cascade? (uni shrimp & worms, moon snails)
4. Moon snail juvies eat algae, what effects?
5. '97 showed kelp scallops at SanO...El Nino cycles different

## General

1. Why such resistance to any challenge?...not normal, scientific method. Real fishey!!
2. Jonna: E-mail thread... stated reef not fail (true by definition), believes in failed science (lots of it!) and says they are locals now...(Highjacked our backyard). Predetermined outcome. Not fluent in local idiosyncricies.
3. Perpetual experiment, fleecing, racketeers. No oversight...perfect for human nature factor.
4. When I'm picking urchins...cloud of fish indicates biomass
5. Why double instead of fix?
6. Many Coastal Act violations
7. Many over time media articles documents sales job...Carrot and stick  
General perception

### *Attitude Protection...*

You have no right to have attitude...this is our backyard and you have failed us. If anyone has right to attitude it is us.

Subjugation

Outnumbered

Oversight impunity

### *Stay on Offense*

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**From:** Ken Bates  
**Sent:** Tuesday, July 24, 2018 6:07 AM  
**To:** Tom Weseloh; deanna.sisk@asm.ca.gov; Shuman, Craig@Wildlife; Noah Oppenheim; Harrison Ibach; Bill Forkner; noyofish@gmail.com; George Bradshaw  
**Cc:** Ashcraft, Susan@FGC  
**Subject:** Fwd: Petition for Collaborative Squid Research in Northern California  
**Attachments:** Petition for Collaborative Squid Research in Northern California.pdf

Sent from my iPad

Begin forwarded message:

**From:** Ken Bates  
**Date:** July 23, 2018 at 9:12:59 PM PDT  
**To:** "[fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)" <[fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)>  
**Subject:** Petition for Collaborative Squid Research in Northern California

Sent from my iPad

# Petition for Collaborative Squid Research in Northern California

Request to form a **Collaborative Partnership** [§ 7056 (k)] with the Department of Fish and Wildlife for **Fishery Dependent** EFI collection [§ 7081(b)] for the Market Squid **Enhanced Status Report** via three geographic experimental permits for use north of Point Arena and shore side data collection by three commercial fishermen's associations of Northern California.

## Goal

The goal is to provide **Essential Fishery Information** (EFI) via a Commission approved collaborative partnership [§ 7056(k)] between three Northern California petitioners and the Department of Fish and Wildlife for the purpose of addressing the "**Data Limited**" geographic area North of Point Arena and assisting the Department's efforts to provide to the Commission an accurate, current, **Enhanced Status Report** (ESR) [§7065(b)] on squid stocks North of Point Arena.

## Background

The Marine Life Management Act (MLMA), the Market Squid FMP and the 2018 Master Plan for Fisheries all make compelling arguments for stakeholder participation in the management of California's fisheries. These documents also present to the Fish and Game Commission and Department of Fish and Wildlife wide ranging powers and options to protect, manage and provide access our marine resources.

The MLMA and various recent reports on the effects of oceanic climate change (Climate and Fisheries, Chavez et al. 2017) direct the Fish and Game Commission to be "flexible and adaptive" to the challenges of climate change. The 2018 Master Plan further states that climate change "may also, affect the ability of fishing fleets to access resources, impact port infrastructure, and potentially change the ability to catch and land fish". These impacts are occurring right now in the fishing communities of Del Norte, Humboldt and Mendocino counties to the detriment of local fishermen and businesses.

Northern Fishing Communities (NFC's) have been engaged in a five year effort to react to the changing oceanic climate off Northern California through diversification of small scale fisheries by attempting to access squid stocks present in increasing numbers clear to Southeast Alaska.

In order for the Department to consider NFC's requests to diversify, the 2018 Master Plan calls for an **Enhanced Status Report** (ESR) (7065(b)) on California's squid stocks. The petitioners believe that the Department, as it stands today is under the following constraints that will present very significant hurdles to the completion of a comprehensive, timely ESR. These constraints include:

1. The area north of Point Arena qualifies as "**data limited**" as described in section 7060(a-d). Past squid landing data is incomplete or inaccurate concerning location, effort and gear type for squid landed north of Point Arena. Fish ticket data may inaccurately list Humboldt Squid (*Dosidicus gigas*) landed in Noyo as "squid", and then be incorrectly attributed as Market Squid (*Doryteuthis opalescens*). Trawl and lampara landings may also have been mixed in past reporting.

2. The Department currently lacks vessels and crews willing or able to do survey and exploratory night fishing north of Point Arena. "At sea" sampling will need to be extremely flexible in order to take immediate advantage of good weather conditions. This requirement does not fit well with long term scheduling of Department assets.
3. Limited Entry landings and log book information submitted to the Department is statistically insignificant north of Point Arena, and is presently considered an anomaly by Department staff. The Limited Entry fleet's efforts north of Point Arena amount to 21 "landing days" since the implementation of the Squid FMP. This equates to three tenths of 1% of the total available fishing time that the Limited Entry fleet had to exercise their opportunity to work north of Point Arena.
4. While the California Wetfish Producers Association (CWPA) engagements in collaboration with the Department to monitor squid stocks in the central and southern part of the state have been successful, there is no equivalent **Fishery Dependent** source of EFI data north of Point Arena.
5. The 2018 Master Plan advises the Department that EFI data in "**data limited**" areas can be augmented by the collection of anecdotal and fishery historical information. Presently, the Department's potential efforts to collect such data from local North Coast fishermen has been compromised by the perceived negative treatment of NCF's attempts to diversify. The very low attendance (following the first 2016 Petaluma meeting) at some of the "Fishing Communities" meetings bears this out.
6. The Department today and in the foreseeable future is severely constrained by available funding including funding for data collection and "at sea" research north of Point Arena.

Because of the above facts, the petitioners, on behalf of the North Coast Fishing Communities, propose the following, based directly on the mandate, contained within the 2018 Master Plan for Fisheries for Collaborative Fishery Research (CFR) [7059(a) (3)], to provide **Essential Fishery Information** (EFI) as a way forward for a successful, timely ESR and ultimately the reconsideration of Petition 2018-004.

## **Proposal Details**

### **Part A**

Shore side collection of anecdotal, historical and current observations of squid stocks, spawning areas and other pertinent data via petitioner's activities within the following Fishermen's Associations:

- Fort Bragg - Salmon Trollers Marketing Association
- Eureka - Humboldt Fishermen's Marketing Association
- Crescent City - Crescent City Fishermen's Association

Petitioners will collect pertinent data through direct face to face communications, marine radio reports and stakeholder networks. Squid data will be logged on forms designed by Department staff and submitted to the Department for processing.

## Part B

Collection of “at sea” EFI data within the framework of a **collaborative fishery partnership** between the applicants and the Department, facilitated by the issuance of three Geographical Experimental Fishing permits as described in section 149.3 of the Market Squid FMP and operating under the following constraints and conditions:

### 1. Conditions

These permits are granted under the express condition that they are for **Fishery Dependent Data Collection** similar to the collaborative **fisheries dependent** model employed by the CWPA fleet and the Department.

*It is important to note that during early design of the Squid FMP, the CWPA expressed support for the three experimental permits for fishing outside of the traditional geographic area of the squid fishery only if those permits met certain conditions. “We recommend that such permits be approved conditioned on a mandatory research component evaluation of the extent of local squid spawning grounds”. (D. Pleshner-Steele CWPA, December 5, 2003)*

This proposal is based on the historical CWPA request for additional data from non-traditional geographic areas for squid stocks.

### 2. Input Controls

- a. Airborne lighting for squid, limited to a total of 2000 watts with an additional submerged component of 500 watts for a total wattage of 2500 watts (or 12% of the allowed FMP wattage).
- b. Fishing Gear is limited to hand brail, power assisted brail, jig, or lampara net as defined in Fish and Game code section 8780. Additionally, each lampara wing corkline would not exceed 55 stretch fathoms and fishing depth not to exceed 10 fathoms
- c. Transfer of catch from net to vessel by hand or power brail only.
- d. All squid taken north of Point Arena must be landed in the Northern Zone (39 degrees north to the Oregon Border

### 3. Output Controls

- a. Ten ton landing limit per calendar day (24 hours)

### 4. Other Conditions

- a. Reduction of permit fees to offset investment and overhead of collaborative research
- b. Partnership Funding – Permittees to deliver to dedicated Fish and Wildlife escrow account, 15% assessment of ex-vessel value of landed squid as matching funds for the express purpose of processing and evaluation of Essential Fisheries Information on squid stocks north of Point Arena.



- c. Southern squid FMP Limited Entry participants will be allowed access to real time reporting of squid abundance and location via this geographical research effort.
- d. Department will determine information and format for reporting.
- e. Seven days per week fishing/survey activity allowed due to North Coast weather constraints.

## Reference

### MLMA Justifications for petition

- Fishermen participation: Chapter 3, 7060 (c)
- Overall collaboration: 7059 (a)(1), (a)(4)
- Fishery Management plans, Best Scientific Information: 7072(b)
- Involvement in Development of FMPs by Fishermen Participation: 7073(4)
- Contents of FMPs (7080-7088), effects of oceanic climate change; 7080(b)
- Economic and social factors: 7080 (c)
- Identify EFI: 7081 (b), (c)

## Final Comments

1. Experimental Geographic permits — Petitioners applying for the three geographical experimental permits in 2014 were told that the permits had expired. There is neither language in the squid FMP nor in the 2018 Master Plan terminating the geographical experimental fishing permit program in the FMP. Also, the 2018 Master Plan and the MLMA gives the Commission and Department wide ranging powers and options to manage fisheries (7056 m, i, j, k, l).
2. Granting permits or a trial fishery will trigger CEQA process. The MLPA specifically states that an adoption or amendment to an FMP by the Fish and Game Commission will **not** trigger a CEQA review. [See Master Plan, page A-11, Section 7078(e)]

2018 APR 11 8:51

August 1, 2018

Executive Director Valerie Termini  
California Department of Fish and Wildlife  
1416 Ninth Street, Room 1320  
Sacramento, CA 95814

RE: CDFW Action Regarding the Management of Giant Keyhole Limpet Fishery

Dear Executive Director Termini,

This letter is a follow-up to my letter to CDFW staff dated April 30, 2018 (attached) in which Stellar Biotechnologies, Inc. requested that the department provide clarification on regulations, policies and guidelines for the management of the giant keyhole limpet, a valuable commercial marine invertebrate resource native to California coastal waters.

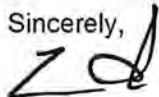
As we noted in our April 2018 communication, the absence of clear regulations regarding the harvest and management of the giant keyhole limpet fishery has led to confusion in the industry, unequal access for stakeholders, and could threaten the sustainability of the resource.

Since 1998, Stellar has worked with CDFW staff to identify how industry practices may be impacting this unique fishery. As a result of these interactions, CDFW took a number of important actions over the past ten years with regards to this species. More recently, CDFW biologists visiting Stellar's facility have come to recognize that the giant keyhole limpet resource may be more vulnerable than they previously recognized.

To support the department's current efforts, at this time, we respectfully request your assistance in bringing greater attention to this matter via the Commission's authority. Companies such as Stellar are experiencing economic consequences from the lack of clarity on this issue and we are willing to participate in any way possible to help CDFW and the Commission bring clarity to this issue.

Thank you in advance for your consideration in this matter and the department's past actions to conserve a truly unique California resource.

Sincerely,



Frank R. Oakes  
President Chief Executive Officer  
Stellar Biotechnologies, Inc.

EC: CDFW Environmental Program Manager Sonke Mastrup,  
CDFW Aquaculture Coordinator Randy Lovell  
CDFW Environmental Scientist Anthony Shiao  
CDFW Environmental Scientist Rob Winn  
California Aquaculture Association Executive Director Michael Lee,  
The Honorable Jacqui Irwin, California Assemblymember, 44th District

April 30, 2018

Mr. Randy Lovell  
State Aquaculture Coordinator  
State of California Department of Fish and Wildlife – Marine Region  
1933 Cliff Dr. Suite 9  
Santa Barbara, CA 93109

Re: California Giant Keyhole Limpet

Dear Randy,

I would like to thank you and the department again for your interest in a truly unique California resource and its global importance.

The Giant Keyhole Limpet (*Megathura crenulata* or GKL) fishery, which is unique to California, has emerged as the sole source for a critical immune stimulating protein, keyhole limpet hemocyanin (KLH). KLH is used in a variety of biomedical research and clinical applications, including therapeutic vaccines for the treatment of cancers, autoimmune diseases, opioid abuse and even Alzheimer's disease. The advancement of these promising drugs through clinical development has created the potential for a rapid escalation in demand for the GKL, and poses a significant challenge for the management of the fishery.

Stellar Biotechnologies, Inc. was formed in 1999, with support from the National Institutes of Health National Cancer Institute, National Science Foundation and the State of California, to develop sustainable, environmentally sound technologies and practices to harvest, cultivate and extract KLH from GKL. Since then, we have developed aquaculture technologies and infrastructure in Ventura County, California that provides an integrated solution and model for the sustainable supply of KLH. We now rely substantially on GKL produced from our hatchery program and our non-harmful extraction method to produce KLH, although we still utilize the fishery. In developing our business, Stellar has worked in cooperation with CDFW to follow best practices based on CDFW's policy objectives for management of the fragile California marine invertebrate fisheries. As you know, given limited historical interest or uses of GKL, there are no regulations specific to the harvest and management of GKL.

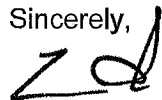
For producers that continue to rely exclusively on GKL obtained from the fishery, the absence of clear regulations regarding the harvest and management of the GKL resource has led to confusion in the industry. For example, in response to pharmaceutical industry concerns for an environmentally sound plan for sourcing KLH from the California fishery, a foreign producer (one of the world's largest KLH suppliers) suggests on its website that the [CDFW has sanctioned](#) the unregulated restocking of GKL in California waters following commercial harvest and extraction of KLH. Other companies represent they produce "[Mariculture KLH](#)" yet are not on record as having the permits required for aquaculture production.

To alleviate this confusion, and to begin planning for a potential dramatic increase in GKL landings, we respectfully ask the department to consider the following actions:

1. **Formally clarify the regulations for commercial harvesting and out-planting of GKL** in a form that can be shared with all stakeholders so that everyone with a commercial or scientific interest fully understands current regulations and can participate on equal footing.
2. **Begin developing a GKL management plan** to assure the long-term sustainability of the fishery under an appropriate BMP that takes into consideration the potential for rapid escalation in landings arising from global demand for the unique KLH protein found in GKL.

Given the limited information that is publicly available on the biology, physiology and natural history of the GKL, I would like to offer Stellar's support to collaborate with CDFW staff to collect the data needed to formulate GKL management plans. In support of this effort I have included the attached brief summary of key observations that we feel are relevant to this discussion and our recommendations.

Sincerely,

A handwritten signature in black ink, appearing to be 'F. Oakes', written over a horizontal line.

Frank Oakes  
President and Chief Executive Officer

Copies to:

Robert Winn  
Anthony Shiao,  
Carlos Mireles



## Giant Keyhole Limpet Management Observations

### Overview

Stellar Biotechnologies was founded to develop sustainable, environmentally sound technologies and practices to harvest, cultivate and extract a key blood protein called KLH from the California Giant Keyhole Limpet (*Megathura crenulata* or GKL). KLH is widely used in medical research, including new therapeutic vaccines under development by multiple pharmaceutical companies and institutes. Despite the global use of KLH, there is very little information of the GKL available in the scientific literature to form the basis of a sound management policy. Although mostly unpublished, Stellar's grant funded research and 20 years of experience working with GKL could contribute greatly to the body of knowledge needed to establish sound management policies. The following summary highlights certain observations that believe may be relevant to policymakers:

- **Out-plantings result in poor survival rates.** Under Stellar's federal grants, the company restocks limpets within the Port of Hueneme's federal waters for research purposes. Our research has found that mortality from out-planting is high (~80%) unless the animals are closely monitored and placed individually to assure attachment to the substrate. As a result, management practices for other marine species used for medical applications, such as horseshoe crabs, are not likely to be relevant for the *M.crenulata*.
- **Intensely harvested areas are slow to repopulate, if ever.** Limpets are solitary animals that do not congregate or occur in high density in the wild; they tend to be cannibalistic when in close proximity. The animal's territorial nature makes it problematic to introduce new limpets to existing populations, even when returning the animal to its previous habitat. Juvenile animals rarely coexist with larger adults; established populations can exist for decades without the recruitment of juveniles. Once GKL are eliminated from an area by harvest, we have not seen the area repopulated. GKL appear to be primary settlers in disturbed habitat such as underwater landslides, new breakwaters, etc. Growth rates are slow, requiring 5-6 years to reach commercial size.
- **Following extraction, animals need to be monitored in controlled conditions for multiple weeks to ensure good health.** In developing our non-harmful extraction method, we observed that many methods that appeared safe at first proved to be fatal ultimately. For example, all of our attempts to penetrate a blood sinus through the foot resulted in 100% mortality by 6-8 weeks following extraction.

### Other Background

Since 1998, Stellar has worked with CDFW staff to identify how industry practices may be impacting the resource. As a result of these interactions, CDFW took the following actions:

- **Commercial landing tickets.** CDFW added *M. crenulata* to commercial landing tickets in order to monitor how extensively the wild resource was being used. Since these limpets are not used for food or other commercial purposes, the department previously had no data on landings.
- **Commercial restocking.** CDFW staff determined that harvesting, extracting hemolymph (blood), rehydrating and subsequent restocking of GKL was not permitted.
- **Scientific Collection Permits.** CDFW clarified that harvesting and restocking for commercial purposes under a Scientific Collection Permit was not permitted.

### Sample of Industry KLH Production Representations

- Ocean Harvest and Restocking: <https://biosynpharma.com/production/>
- Aquaculture: <https://www.stellarbiotechnologies.com/stellar-klh/world-leading-aquaculture>
- "Mariculture": <https://www.thermofisher.com/order/catalog/product/77600>



Tracking Number: (2018-010)

To request a change to regulations under the authority of the California Fish and Game Commission (Commission), you are required to submit this completed form to: California Fish and Game Commission, 1416 Ninth Street, Suite 1320, Sacramento, CA 95814 or via email to FGC@fgc.ca.gov. Note: This form is not intended for listing petitions for threatened or endangered species (see Section 670.1 of Title 14).

Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or FGC@fgc.ca.gov.

### SECTION I: Required Information.

*Please be succinct. Responses for Section I should not exceed five pages.*

1. **Person or organization requesting the change (Required)**  
Name of primary contact person: *RONNY BALISTRERI*  
Address:  
Telephone number:  
Email-address: *NO EMAIL*
2. **Rulemaking Authority (Required)** - Reference to the statutory or constitutional authority of the Commission to take the action requested: *713, 1050, 7071 AND 8587.1*
3. **Overview (Required)** - Summarize the proposed changes to regulations: *PLEASE SEE ATTACHED.*
4. **Rationale (Required)** - Describe the problem and the reason for the proposed change: *PLEASE SEE ATTACHED.*

### SECTION II: Optional Information

5. **Date of Petition:**
6. **Category of Proposed Change**
  - ☐ Sport Fishing
  - ☒ Commercial Fishing
  - ☐ Hunting
  - ☐ Other, please specify:





7. **The proposal is to:** (To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)  
☒ Amend Title 14 Section(s): 150, 150.02  
☐ Add New Title 14 Section(s):  
☐ Repeal Title 14 Section(s):
8. **If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition**  
Or ☒ Not applicable.
9. **Effective date:** If applicable, identify the desired effective date of the regulation.  
If the proposed change requires immediate implementation, explain the nature of the emergency:
10. **Supporting documentation:** Identify and attach to the petition any information supporting the proposal including data, reports and other documents:
11. **Economic or Fiscal Impacts:** Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing:
12. **Forms:** If applicable, list any forms to be created, amended or repealed:

**SECTION 3: FGC Staff Only**

Date received:

FGC staff action:

- ☒ Accept - complete  
☐ Reject - incomplete  
☐ Reject - outside scope of FGC authority

Tracking Number

Date petitioner was notified of receipt of petition and pending action: August 22-23, 2018

Meeting date for FGC consideration: October 17-18, 2018

FGC action:

- ☐ Denied by FGC  
☐ Denied - same as petition \_\_\_\_\_  
Tracking Number  
☐ Granted for consideration of regulation change

ORIGINAL  
DATE STAMP  
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CALIFORNIA  
FISH AND GAME  
COMMISSION

2018 JUL -5 PM 1:30

TODAY'S  
DATE STAMP

RECEIVED  
CALIFORNIA  
FISH AND GAME  
COMMISSION

2018 JUL 25 PM 1:30



# Instructions for Submitting a Petition for Regulation Change

Beginning October 1, 2015, every person or agency recommending that a regulation be added, amended, or repealed must submit a petition to the commission using the authorized petition form: [FGC 1 Petition to the California Fish and Game Commission for Regulation Change \(docx\)](#).

Please complete the form and submit it to the Commission

- in person at [Commission Meetings](#)
- via [e-mail to fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)
- via mail to California Fish and Game Commission, 1416 Ninth Street, Room 1320, Sacramento, CA 95814

A petition will be rejected by Commission staff if it is not submitted on form FGC 1, if it fails to contain necessary information in each of the required categories listed on FGC 1, or if it does not pertain to regulations under the Commission's authority. A rejected petition will be returned to the petitioner by the Commission staff within 10 working days of receipt.

**Commission Action on Petition:** An accepted petition will be scheduled for consideration at the next available Commission meeting. The Commission will consider the petition, the Commission staff's recommendation, Department of Fish and Wildlife's initial evaluation, if any, and any oral or written public comments received, and take one of the following actions:

- If the Commission finds that the petition does not provide sufficient information to indicate that the petitioned change may be warranted, the Commission may deny the petition.
- If any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted, the Commission may deny the petition.
- If the Commission finds that the petition provides sufficient information to indicate that the petitioned change may be warranted, the Commission may grant the petition for further consideration and add the petitioned change to its rulemaking schedule.

Questions regarding the use of the form should be directed to [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov) or (916) 653-4899.

[Home Table of Contents](#)**§ 150. Nearshore Fishery Restricted Access Program.**

14 CA ADC § 150

**BARCLAYS OFFICIAL CALIFORNIA CODE OF REGULATIONS**Barclays Official California Code of Regulations [Currentness](#)

Title 14. Natural Resources

Division 1. Fish and Game Commission-Department of Fish and Game

Subdivision 1. Fish, Amphibians and Reptiles

Chapter 6. Fish, Commercial (Refs &amp; Annos)

14 CCR § 150

**§ 150. Nearshore Fishery Restricted Access Program.***Regulation  
Section  
you'd like  
to  
change*

(a) Nearshore Fishery Permits issued pursuant to Fish and Game Code Section 8587, are valid only in the regional management area specified in the permit.

(b) The department shall issue a Nearshore Fishery Permit for a regional management area described in Section 52.04 to each nearshore fishery permittee who meets the regional qualifying criteria below. A person will receive only one Nearshore Fishery Permit for use in only one regional management area and cannot hold a valid permit for more than one regional management area. A person meeting the qualifications for more than one regional management area must make a permanent, irrevocable decision prior to obtaining a Nearshore Fishery Permit for the 2003-2004 permit year to fish in one regional management area. The permit shall not be changed to another regional management area under any circumstances.

(c) Nearshore Fish Stocks Used for Landings Qualification. The following names or market categories and their associated codes as recorded on department fish landing receipts pursuant to Fish and Game Code Section 8043 will be used to determine eligibility: black-and-yellow rockfish (251), cabezon (261), California scorpionfish (260), California sheephead (145), China rockfish (258), gopher rockfish (263), grass rockfish (652), greenlings of the genus *Hexagrammos* (290), kelp rockfish (659), group nearshore rockfish (973) and group gopher rockfish (962).

(d) Initial Permit Issuance.

(1) North Coast Region. The person has a valid 2002-2003 Nearshore Fishery Permit that has not been suspended or revoked, and has landed nearshore fish stocks as described in Section 150.01, Title 14, CCR, from January 1, 1994 to December 31, 1999, as documented by department fish landing receipts submitted in his name and commercial fishing license identification number pursuant to Fish and Game Code Section 8046, and satisfies the landings and participation requirements below:

(A) has made at least one landing of nearshore fish stocks as described in Section 150.01, Title 14, CCR, between January 1, 1994 and December 31, 1999, and

(B) has made at least one landing of nearshore fish stocks as described in Section 150.01, Title 14, CCR, in either the 2000 or 2001 calendar year.

(C) landings of nearshore fish stocks used to qualify must have been made at ports located within the North Coast Region as defined in Section 52.04, Title 14, CCR.

(D) Nearshore Fishery Permits issued pursuant to subsection (d)(1) are designated North Coast Region Nearshore Fishery Permits, are transferable, and authorize the holder to take, possess aboard a vessel, or land nearshore fish stocks as described in Section 150.01, Title 14, CCR, in the North Coast Region only.

(2) North-Central Coast Region. The person has landed nearshore fish stocks as described in Section 150.01, Title 14, CCR, from January 1, 1994 to December 31, 1999, as documented by department fish landing receipts submitted in his name and commercial fishing license identification number pursuant to Fish and Game Code Section 8046, and has a valid 2002-2003 Nearshore Fishery Permit that has not been suspended or revoked, and satisfies the landing and participation requirements below:

(A) has landed at least 500 pounds of nearshore fish stocks as described in Section 150.01, Title 14, CCR, in each of 3 calendar years during the period 1994 to 1999, inclusive.

(B) has made at least one landing of nearshore fish stocks as described in Section 150.01, Title 14, CCR, in either the 2000 or 2001 calendar year.



(C) landings of nearshore fish stocks used to qualify must have been made at ports located within the North-Central Coast Region as defined in Section 52.04, Title 14, CCR.

(D) Nearshore Fishery Permits issued pursuant to subsection (d)(2) are designated North-Central Coast Region Nearshore Fishery Permits, are transferable, and authorize the holder to take, possess aboard a vessel, or land nearshore fish stocks as described in Section 150.01, Title 14, CCR, in the North-Central Coast Region only.

(3) South-Central Coast Region. The person has landed nearshore fish stocks as described in Section 150.01, Title 14, CCR, from January 1, 1994 to December 31, 1999, as documented by department fish landing receipts submitted in his name and commercial fishing license identification number pursuant to Fish and Game Code Section 8046, and has a valid 2002-03 Nearshore Fishery Permit that has not been suspended or revoked, and satisfies the landing and participation requirements below:

(A) has landed at least 500 pounds of nearshore fish stocks as described in Section 150.01, Title 14, CCR, in each of 3 calendar years during the period 1994 to 1999, inclusive, and which sold for a minimum average ex-vessel price per pound of \$2.00 for landings of nearshore fish stocks landed during the most current three calendar years with landings of nearshore fish stocks during the period 1994 to 1999, inclusive.

(B) has made at least one landing of nearshore fish stocks as described in Section 150.01, Title 14, CCR, in either the 2000 or 2001 calendar year.

(C) landings of nearshore fish stocks used to qualify must have been made at ports located within the South-Central Coast Region.

(D) Nearshore Fishery Permits issued pursuant to subsection (d)(3) are designated South-Central Coast Region Nearshore Fishery Permits, are transferable, and authorize the holder to take, possess aboard a vessel, or land nearshore fish stocks as described in Section 150.01, Title 14, CCR, in the South-Central Coast Region only.

(4) South Coast Region. The person has landed nearshore fish stocks as described in Section 150.01, Title 14, CCR, from January 1, 1994 to December 31, 1999, as documented by department fish landing receipts submitted in his name and commercial fishing license identification number pursuant to Fish and Game Code Section 8046, and has a valid 2002-2003 Nearshore Fishery Permit that has not been suspended or revoked, and satisfies the landing and participation requirements below:

(A) has landed at least 500 pounds of nearshore fish stocks as described in Section 150.01, Title 14, CCR, in each of 3 calendar years during the period 1994 to 1999, inclusive, and which sold for a minimum average ex-vessel price per pound of \$2.00 for landings of nearshore fish stocks landed during the most current three calendar years with landings of nearshore fish stocks during the period 1994 to 1999, inclusive.

(B) has made at least one landing of nearshore fish stocks as described in Section 150.01, Title 14, CCR, in either the 2000 or 2001 calendar year.

(C) landings of nearshore fish stocks used to qualify must have been made at ports located within the South Coast Region as defined in Section 52.04, Title 14, CCR.

(D) Nearshore Fishery Permits issued pursuant to subsection (d)(4) are designated South Coast Region Nearshore Fishery Permits, are transferable, and authorize the holder to take, possess aboard a vessel, or land nearshore fish stocks as described in Section 150.01, Title 14, CCR, in the South Coast Region only.

(e) Initial Qualification for 20-year California Commercial Fishermen. During the initial year of the nearshore restricted access program, any person who has been licensed as a California commercial fisherman for at least 20 years at the time of application, and who does not qualify for a permit in (d)(1), (2), (3), or (4) above, and who has participated in the commercial nearshore fishery for at least one of those years as documented by department fish landing receipts submitted in his name and commercial fishing license identification number pursuant to Fish and Game Code Section 8046, upon application shall be issued a Non-Transferable Nearshore Fishery Permit for one regional management area, based on the following minimum landing requirements in subsection (e)(1), (2), (3), or (4) below:

(1) landed at least 200 pounds of nearshore fish stocks as described in Section 150.01 in any one calendar year between January 1, 1994 and December 31, 1999.

(A) landings used to qualify must have been made at ports located within the North Coast Region as defined in Section 52.04.

(B) Nearshore Fishery Permits issued pursuant to subsection (e)(1) are designated Non-Transferable North Coast Nearshore Fishery Permits and authorize the holder to take, possess aboard a vessel, or land nearshore fish stocks as described in Section 150.01 in the North Coast Region only.

(2) landed at least 650 pounds of nearshore fish stocks as described in Section 150.01 in any one calendar year between January 1, 1994 and December 31, 1999.

(A) landings used to qualify must have been made at ports located within the North-Central Coast Region as defined in Section 52.04.



(B) Nearshore Fishery Permits issued pursuant to subsection (e)(2) are designated Non-Transferable North-Central Coast Nearshore Fishery Permits and authorize the holder to take, possess aboard a vessel, or land nearshore fish stocks as described in Section 150.01 in the North-Central Coast Region only.

(3) landed at least 1,050 pounds of nearshore fish stocks as described in Section 150.01 in any one calendar year between January 1, 1994 and December 31, 1999.

(A) landings used to qualify must have been made at ports located within the South-Central Coast Region as defined in Section 52.04.

(B) Nearshore Fishery Permits issued pursuant to subsection (e)(3) are designated Non-Transferable South-Central Coast Nearshore Fishery Permits and authorize the holder to take, possess aboard a vessel, or land nearshore fish stocks as described in Section 150.01 in the South-Central Coast Region only.

(4) landed at least 800 pounds of nearshore fish stocks as described in Section 150.01 in any one calendar year between January 1, 1994 and December 31, 1999.

(A) landings used to qualify must have been made at ports located within the South Coast Region as defined in Section 52.04.

(B) Nearshore Fishery Permits issued pursuant to subsection (e)(4) are designated Non-Transferable South Coast Nearshore Fishery Permits and authorize the holder to take, possess aboard a vessel, or land nearshore fish stocks as described in Section 150.01 in the South Coast Region only.

(f) **Capacity Goal.** The capacity goal for each nearshore regional management area is as follows: 14 North Coast Region Nearshore Fishery Permits, 9 North-Central Coast Region Nearshore Fishery Permits, 20 South-Central Coast Region Nearshore Fishery Permits, and 18 South Coast Region Nearshore Fishery Permits. The capacity goal for Non-Transferable Nearshore Fishery Permits is zero.

(g) **Permit Transfers, Procedures and Timelines.**

(1) Pursuant to Fish and Game Code Section 8587.1(b), Fish and Game Code Section 7857(j) is made inoperative as applied to the commercial nearshore fishery.

(2) A person with a valid transferable nearshore fishery permit that has not been suspended or revoked may transfer his/her permit to a licensed California commercial fisherman. The permit shall be transferred for use in the same regional management area listed on the permit.

(3) Upon the death of a person with a valid transferable nearshore fishery permit, that person's estate shall immediately, temporarily relinquish the permit to the department's License and Revenue Branch. The estate may renew the permit as provided for in this section if needed to keep the permit valid. The estate of the decedent may transfer the permit pursuant to this section no later than two (2) years from the date of death of the permit holder as listed on the death certificate.

(4) The permit holder or the estate of the deceased permit holder shall submit the notarized transfer application and the nonrefundable permit transfer fee specified in Section 705 for each permit transfer. The transfer shall take effect on the date on the written notice of approval of the application given to the transferee by the department. The nearshore fishery permit shall be valid for the remainder of the permit year and may be renewed in subsequent years pursuant to this section.

(5) An application for a transfer of a nearshore fishery permit shall be deferred when the current permit holder is awaiting final resolution of any pending criminal, civil and/or administrative action that could affect the status of the permit.

(6) If a transferable nearshore fishery permit is transferred to a person with a valid non-transferable nearshore fishery permit, the non-transferable nearshore fishery permit shall become null and void and the permit shall be immediately surrendered to the department's License and Revenue Branch.

(7) Upon the death of a person with a valid non-transferable nearshore fishery permit, the permit shall become null and void and the estate shall immediately surrender the permit to the department's License and Revenue Branch.

(h) **Application Deadline for Initial Issuance of Nearshore Fishery Permit.** All applications (FG 1326(1/03), incorporated herein by reference) and permit fees for initial issuance of Nearshore Fishery Permits under the restricted access program must be received by the department, or, if mailed, be postmarked on or before June 30, 2003. Applications and permit fees for initial issuance of Nearshore Fishery Permits under the restricted access program received by the department, or, if mailed, postmarked from July 1 through July 31, 2003 will be assessed a \$50 late fee. Applications and permit fees for the initial issuance of Nearshore Fishery Permits under the restricted access program postmarked or received after July 31, 2003 shall be returned to the applicant unissued.

(i) **Nearshore Fishery Permit Renewal Requirements.** Notwithstanding Fish and Game Code Section 8587, after April 1, 2004, Nearshore Fishery Permits for a regional management area will be issued annually by the department only to those persons who have held a valid Nearshore Fishery Permit for that regional management area in the immediately preceding permit year.

(j) **Application Deadline for Nearshore Fishery Permit Renewal.** All applications as specified in Section 705 and permit fees for renewal of Nearshore Fishery Permits must be received by the department, or, if mailed, postmarked on or before April 30 of each permit year. Late fees, late fee deadlines, and late renewal appeal provisions are specified in Fish and Game Code Section 7852.2.



X  
Attn:

6-28-18

Ca. Fish & Game Commission  
Regarding Near Shore Permit

My husband has a near  
shore permit since 2002.  
My husband would like  
to transfer his permit.  
But Fish & Game won't  
allow my husband to  
transfer the permit  
because when my husband  
sold his rock cod to  
the market, he sold  
the Rock Cod for \$1.85 LB.  
The other fishermen sold  
their rock cod for  
\$2.00 a LB. They can  
transfer their permit,  
but my husband can't.  
My husband found out  
the near shore permits  
are transferable. On  
my husband's permit  
it says non transferable.

Thank You  
Hoping to hear from You soon!

-2-

We are hoping the Fish &  
Game Commission will  
change my husband's  
non transferable to  
a transferable permit.  
Regulations went into  
effect April 1st 2018

Thank You Again  
Edie Balistreri  
for

Benny Balistreri



Tracking Number: 2015-014

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Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or [FGC@fgc.ca.gov](mailto:FGC@fgc.ca.gov).

### **SECTION I: Required Information.**

*Please be succinct. Responses for Section I should not exceed five pages*

**1. Person or organization requesting the change (Required)**

Name of primary contact person: Patrick Kallerman

Address:

Telephone number:

Email address:

**2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested:**

Sections 200, 202, 205, 215, 220, 240, 315 and 316.5, Fish and Game Code

**3. Overview (Required) - Summarize the proposed changes to regulations:**

This proposal would amend subsections of Chapter 3, Article 3, Section 7.50(b) – Alphabetical List of Waters with Special Fishing Regulations – and subsections of Chapter 3, Article 4, Section 8.00(b) – Low-Flow Restrictions Mendocino, Sonoma, and Marin County coastal streams: Stream Closures: Special Low Flow Conditions – Title 14, California Code of Regulations.

Proposed **amendments to subsections of 7.50(b)** would apply to the following streams (north to south): Usal Creek, Cottaneva Creek, Ten Mile River, Noyo River, Big River, Albion River, Navarro River, Greenwood Creek, Elk Creek, Alder Creek, Brush Creek, Garcia River, Gualala River, Russian Gulch, Salmon Creek, Walker Creek, and Sonoma Creek.

For Sonoma Creek (Sonoma County), and all streams tributary to the Pacific Ocean (and its bays) in Mendocino, Sonoma, and Marin counties, except for the Russian River:

- Amend Section 7.50(b) to permit only artificial lures with barbless hooks to be used year-round.
- Amend Section 7.50(b) to close streams to all angling from April 1<sup>st</sup> through October 31<sup>st</sup>.





Proposed **amendments to subsections of 8.00(b)** are:

- Amend Section 8.00(b) to leave the Navarro River open to angling on the main stem below the confluence of the North Fork Navarro when the applicable designated gauging station is less than the minimum flows set forth.
- Amend Section 8.00(b) to leave the Garcia River open to angling on the main stem below the Highway 1 bridge when the applicable designated gauging station is less than the minimum flows set forth.
- Amend Section 8.00(b) to leave the Gualala River open to angling on the main stem below the confluence of the North Fork Gualala when the applicable designated gauging station is less than the minimum flows set forth.

**4. Rationale (Required) - Describe the problem and the reason for the proposed change:**

The problem – Many of the Central Coast streams described in the Overview section are considered ‘focus populations’ for the recovery of ESA-listed salmonids and merit improved protection as habitat and from angling practices and equipment that are statistically more harmful to fish. These rivers are managed as steelhead and coho streams. There are no hatchery fish added to these streams to support a put-and-take fishery.

However, several of these streams – the Gualala, the Garcia, and the Navarro in particular -- are legendary steelhead fisheries that have played a prominent role in the evolution of the culture and techniques of modern steelhead angling. Because these three streams are so important to anglers, the angling regulations for them deserve more consideration in terms of alternative strategies and language that will better protect salmon and steelhead through all of their freshwater life history phases while enhancing angling opportunity.

Currently, these streams remain open to angling from mid-Spring to mid-Fall. The result is that current angling regulations allow catch of salmonid smolts, juveniles, and kelts when they are at their most vulnerable. In addition, the lack of a provision regarding use of barbless hooks on these streams probably elevates catch rates and likely increases stress on salmonid populations throughout the year. Lastly, the current flow triggers for angling closures on these streams, while well-intentioned, lack scientific justification, are needlessly over-restrictive, and dramatically reduce many of the lowest-impact angling opportunities. A simple adjustment in the stream reaches that are open to angling when streamflows drop below the current flow trigger would provide strong protection for fish, preserve a greater variety of angling opportunity, and help reduce poaching and other illegal activities all along these rivers.

The solution – (1) Transition to allowing only artificial lures with barbless hooks for all angling on these waters. This is a simple and pragmatic step to reduce angling impacts regardless of preferred tackle type and spread the use of a limited resource across a greater number of anglers.

(2) Limit angling only to periods when fully mature adult fish are in these streams. A strategically limited angling season will reduce angling pressure when salmon and steelhead are most vulnerable while preserving more angling opportunity in the traditional winter run steelhead season.

(3) Adjust the current regulations to allow angling for steelhead throughout the tidally influenced reaches of the Gualala, Garcia, and Navarro rivers when streamflows drop below the current trigger for



the designated gauging stations. The reaches proposed here to remain open are predominately tidally affected and therefore have adequate volume and flow for fish passage throughout the season. They are also well below the well documented spawning habitat in these rivers.

## SECTION II: Optional Information

5. **Date of Petition:** [Click here to enter text.](#)
6. **Category of Proposed Change**  
☐ Sport Fishing  
☐ Commercial Fishing  
☐ Hunting  
☐ Other, please specify: [Click here to enter text.](#)
7. **The proposal is to:** *(To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)*  
☐ Amend Title 14 Section(s): [Click here to enter text.](#)  
☐ Add New Title 14 Section(s): [Click here to enter text.](#)  
☐ Repeal Title 14 Section(s): [Click here to enter text.](#)
8. **If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition** [Click here to enter text.](#)  
Or ☐ Not applicable.
9. **Effective date:** If applicable, identify the desired effective date of the regulation.  
If the proposed change requires immediate implementation, explain the nature of the emergency: [Click here to enter text.](#)
10. **Supporting documentation:** Identify and attach to the petition any information supporting the proposal including data, reports and other documents: [Click here to enter text.](#)
11. **Economic or Fiscal Impacts:** Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: [Click here to enter text.](#)
12. **Forms:** If applicable, list any forms to be created, amended or repealed:  
[Click here to enter text.](#)

## SECTION 3: FGC Staff Only

Date received: [Click here to enter text.](#)

FGC staff action:

- ☒ Accept - complete  
☐ Reject - incomplete  
☐ Reject - outside scope of FGC authority

RECEIVED  
CALIFORNIA  
FISH AND GAME  
COMMISSION  
2015 DEC 15 AM 8:17



Tracking Number

Date petitioner was notified of receipt of petition and pending action: 12/15/15

Meeting date for FGC consideration: Feb 10-11, 2016

FGC action:

☐ Denied by FGC

☐ Denied - same as petition \_\_\_\_\_

Tracking Number

☐ Granted for consideration of regulation change



State of California  
Department of Fish and Wildlife

## Memorandum

Date: September 6, 2018

To: Stafford Lehr, Deputy Director  
Wildlife and Fisheries Division

From: Kevin Shaffer, Chief  
Fisheries Branch



Subject: Fish and Game Commission Regulation Change Petition No. 2015-014

### Overview

On December 15, 2015, the Fish and Game Commission (Commission) received a Regulation Change Petition (Tracking Number 2015-014) concerning sport fishing regulations on Mendocino, Sonoma, and Marine County coastal streams (California Code of Regulations, Title 14, sections 7.50(b) and 8.00(b)). The Commission forwarded the petition to the Department of Fish and Wildlife (Department) for review and requested the Department to meet with the petitioner to discuss their requests and concerns. The proposed changes outlined in petition include the following:

- 1) Amend Section 7.50(b) to permit only artificial lures with barbless hooks to be used year-round;
- 2) Close streams to all angling from April 1 through October 31;
- 3) Amend Section 8.00(b) to leave the Navarro River open to angling on the main stem below the confluence of the North Fork Navarro when the applicable designated gauging station is less than the minimum flows set forth;
- 4) Amend Section 8.00(b) to leave the Garcia River open to angling on the main stem below the Highway 1 bridge when the applicable designated gauging station is less than the minimum flows set forth; and
- 5) Amend Section 8.00(b) to leave the Gualala River open to angling on the main stem below the confluence of the North Fork Gualala when the applicable designated gauging station is less than the minimum flows set forth.

Fisheries management staff met with the petitioner on two separate occasions to discuss their proposed regulation changes. For the reasons stated herein, the Department does not support the proposed regulation changes in this petition, and recommends that the Commission deny this petition. Attached are formal responses to this petition from the Department, memo dated April 24, 2018, and from the National Marine Fisheries Service (NMFS), letter dated April 4, 2018. Please refer to the attached documents for additional information including detailed summaries, figures, data and photos that support the Department's recommendation to deny this petition.

### Background

In 2014, the Department proposed regulatory changes to Title 14, Chapter 3, Article 4, Section 8.00, subsection (b) to add low-flow fishing restrictions to the Russian River and base the closure of North Central-Coast streams on one or more stream gauges on rivers that are more representative of these North Central-Coast streams than the current regulated flows of the Russian River. The proposed regulatory changes were the result of a collaborative effort among NMFS, the Department, local stakeholders and watershed councils, to address fishery impact concerns that had arisen during the prior three years of drought, with the goal of protecting ESA-listed fish while still providing sport fishing opportunities.

On December 3, 2014, following two stakeholder meetings and three public Commission meetings, the Commission adopted a low flow closure threshold for all Mendocino, Sonoma, and Marine County coastal streams open to sport fishing as currently designated in Title 14, Chapter 3, subsections 7.50(b) and 8.00(b)(1). These newly implemented low flow fishing regulations, which include the Navarro, Garcia, and Gualala rivers, are in alignment with the Department and NMFS' fisheries management objectives and mission to protect and recover ESA-listed salmonids under the federal and state ESAs.

Approximately nine months after the regulations went into effect, the Commission received a petition (Tracking Number 2015-014) to amend the newly adopted low flow closure regulations on Mendocino, Sonoma, and Marine County coastal streams. The Commission forwarded the Petition to the Department for review and directed the Department to meet with the petitioner to discuss the petitioner's concerns and requests.

### Coordination with Petitioner

- Meeting in Santa Rosa on November 8, 2017 – Fisheries management staff from Region 1, Region 3, and Fisheries Branch met with the petitioner to answer questions and discuss their concerns. The purpose of this meeting was not for the Department to give definitive answers to the petitioner's regulation change requests but rather to have open dialogue.
- Wildlife Resources Committee (WRC) Meeting on January 18, 2018 – The Chief of Fisheries Branch presented the Department's recommendation to the WRC that it not move forward with the proposed regulation changes in Regulation Change Petition Tracking Number 2015-014. After hearing comments from the public, the WRC did not make a ruling on the petition and asked the Department to meet with the stakeholders again.
- Meeting in Santa Rosa on July 11, 2018 – Department held a second meeting with the petitioner to discuss their proposed regulation changes and answer questions.

In attendance were six Department staff, three NMFS staff, the petitioner and one stakeholder. The Department asked NMFS to attend the meeting because the agency had been involved in the development of the low flow regulations in 2014, including providing its own proposal for low flow fishing restrictions on north central coast rivers.

#### Responses to Proposed Regulation Changes

- 1) The Department does not support a year-round restriction on the use of bait on the subject waters at this time. Current regulation allows the use of bait, artificial lures, and only barbless hooks from November 1 to March 31, in the subject waters. Bait fishing for steelhead can be effective during river conditions that are higher flow and cloudier water conditions that are not effective for artificial lures, and bait fishing is a gear type frequently used for steelhead angling. Amending the regulation or the removal of bait gear would significantly reduce a popular angling opportunity. Bait and gear restrictions on anadromous waters will be addressed by the Department during the development of pending statewide anadromous regulations.
- 2) The Department does not support amending the regulations to close all streams to fishing from April 1 to October 31. Fishing is currently closed from April 1 to the day before the fourth Saturday in May in the subject waters for the protection of post spawn adult steelhead that are migrating downstream to the ocean and for downstream migrating salmonid juveniles. From the fourth Saturday in May to October 31 these waters are open to catch and release of resident trout and fishing for non-native fish species present in some streams. Anecdotal CDFW observation of fishing pressure that occurs from the fourth Saturday in May to October 31 indicates very little fishing and impact to native fish occurs during this time period. Amending the regulation to close fishing from April 1 to October 31 does not provide significant additional protection to the fisheries resource and reduces fishing opportunity. Fishing seasons on anadromous waters will be addressed by the Department during the development of pending statewide anadromous regulations.
- 3) The Department does not support the proposal to open angling in the lower portions of the Gualala, Navarro, and Garcia rivers during low flow conditions. During low flow events, steelhead can be concentrated in shallow clear water, easily visible to anglers, and less able to migrate upstream. These conditions can create an increased state of stress for the fish and make them more prone to repeat hooking, which may lead to mortality.

Since the implementation of these regulations, the majority of the closures occur prior to the onset of winters rains, coinciding with migration periods of federally ESA-listed threatened California Coastal (CC) Chinook Salmon; and federally and state ESA-listed endangered Central California Coast (CCC) Coho Salmon.



The attached responses to this petition prepared by the Department and NMFS include information to demonstrate that since the implementation of the 2015 low flow regulations, ample fishing opportunity through the winter and spring periods which coincide with the migration of steelhead, was available to anglers. It should be noted that the most of the low flow closures occur between September and December, which are prior to the primary run timing for steelhead.

### Conclusion

The Department does not support Regulation Change Petition (Tracking No. 2015-014). The proposed regulation changes conflict with state and federal fisheries management objectives and would undo recovery actions listed in NMFS species recovery plans. The Department and NMFS believe that the current low flow restrictions are working to improve the protection for ESA-listed salmonids during their upstream migrations to subsequent spawning destinations, and provide adequate fishing opportunity. The Department will continue to monitor flows on the Mendocino, Sonoma, and Marine County coastal streams and evaluate the effectiveness of the low flow closures. In addition, the Department will address gear and seasons on all coastal streams during development of pending statewide anadromous regulations. The Department strives to keep all waters of the state open to fishing as much as possible, for all angling types, will petition the Commission to change the current regulations if, in the future, data shows that the regulations are no longer effective.



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
West Coast Region  
777 Sonoma Avenue, Room 325  
Santa Rosa, California 95404-4731

June 29, 2018

Jonathan Nelson  
Anadromous Conservation and Management Program  
Fisheries Branch  
California Department of Fish and Wildlife  
830 S Street  
Sacramento, California 95811

Dear Mr. Nelson:

This letter is in regard to the Petition (Petition) for regulation change authored by Mr. Patrick Kallerman (petition tracking number 2015-014) to the California Fish and Game Commission (CFGC) recommending changes to freshwater fishing regulations within Mendocino County coastal stream indicated in Chapter 3, Article 3 subsections 7.50(b): Alphabetical List of Waters with Special Fishing Regulations; and subsections Chapter 3 Article 4, 8.00(b): Low-Flow Restrictions Mendocino, Sonoma, and Marin County coastal streams: Stream Closures: Special Low Flow Conditions: Title 14, California Code of Regulations. We understand Mr. Kallerman requests the following changes:

1. Amend Section 7.50(b) to permit only artificial lures with barbless hooks to be used year-round.
2. Amend Section 7.50(b) to close streams to all angling from April 1<sup>st</sup> through October 31<sup>st</sup>.
3. Amend Section 8.00(b) to leave the Navarro River open to angling on the main stem below the confluence of the North Fork Navarro when the applicable designated gauging station is less than the minimum flows set forth.
4. Amend Section 8.00(b) to leave the Garcia River open to angling on the main stem below the Highway 1 Bridge when the applicable designated gauging station is less than the minimum flows set forth.
5. Amend Section 8.00(b) to leave the Gualala River open to angling on the main stem below the confluence of the North Fork Gualala when the applicable designated gauging station is less than the minimum flows set forth.

Regarding Petition changes 1 and 2: We understand that gear and seasonal restrictions in anadromous trout waters will be addressed during the development of pending statewide anadromous regulations by California Department of Fish and Wildlife (CDFW). NOAA's National Marine Fisheries Service (NMFS) supports the current regulations at this time, but requests to discuss and evaluate any future proposed changes to the current sport fishing regulations together with CDFW prior to implementation.

Regarding Petition changes 3-5: Salmonids in many coastal watersheds in California can be subject to increased angling pressure during periods of extended or prolonged low-flow conditions. When low-flow conditions occur, adult salmonids are subjected to increased potential for mortality due to



the physiological stress, predation, and elevated angling pressure associated with decreased passage or migration opportunity caused by delayed or muted environmental cues such as flow and temperature changes. CDFW currently has low-flow closure regulations for most anadromous salmonid watersheds throughout California for the purpose of protecting adult salmonids during critical spawning and migration periods.

In 2013, NMFS, in close coordination with CDFW Regions 1 and 3, authored a proposed low-flow fishing closure regulation for Mendocino, Sonoma, and Marin County coastal streams to enhance the protection of federally Endangered Species Act (ESA) listed adult salmonids during prolonged low-flow periods (Enclosure 1). Following agency and public review where NMFS provided further data and information (Enclosure 2), in 2015 the CFGC supported a low-flow closure threshold for all Mendocino County Coastal Streams open to sport fishing, as currently designated in Title 14 Chapter 3, Articles 3 subsections 7.50(B) and 8.00(b)(1). These newly implemented low-flow fishing regulations, which include the Navarro, Garcia and Gualala Rivers, are in alignment with NMFS' mission to protect and recover ESA-listed salmonids under the federal ESA of 1973, as amended.

Since the implementation of these regulations, the enhanced protections have resulted in fishing restrictions prior to the onset of winter rains, coinciding with the migration periods of federally ESA-listed threatened California Coastal (CC) Chinook salmon; ESA-listed threatened Central California Coast (CCC) steelhead; ESA-listed threatened Northern California (NC) steelhead, and federally and state ESA-listed endangered Central California Coast (CCC) coho salmon. Enclosed, we provide information (Enclosure 3) to demonstrate that following river flow increases which coincide with the migration of steelhead, the remaining fishing season allowed for ample quality fishing opportunity through the winter and spring periods since implementation of the current low-flow fishing closures since 2015. We are available to discuss this information further with CDFW, Mr. Kallerman and members of the interested fishing community.

In summary, NMFS believes federally ESA-listed salmonids inhabiting Mendocino, Sonoma, and Marin County coastal streams should receive the necessary protection from anglers during critical low-flow periods to ensure species recruitment and conservation goals. NMFS supports appropriate low-flow closure thresholds for Mendocino, Sonoma, and Marin County coastal streams and the current protections which the regulations in subsections 7.50(b) and 8.00(b) provide. Further, we are committed to working with CDFW in the ongoing evaluation, development and improvement of California's sport fishing regulations.

If you have any questions or would like additional information regarding our letter or enclosed information, please contact Joshua Fuller at (707) 575-6096 or by email at [Joshua.Fuller@noaa.gov](mailto:Joshua.Fuller@noaa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'R M A' followed by a large flourish and the letters 'F O R'.

Alecia Van Atta  
Assistant Regional Administrator  
California Coastal Office

Enclosures

cc: Charlton Bonham, Director, CDFW, Sacramento, CA  
Stafford Lehr, Fisheries Branch Chief, CDFW, Sacramento, CA  
Gregg Erickson, Regional Manager, CDFW, Yountville, CA  
Eric Larson, Biological Programs Manager, CDFW, Yountville, CA  
Neil Manji, Regional Manager, CDFW, Redding, CA  
Tony LaBanca, Coastal Fisheries Environmental Program Manager, CDFW, Eureka, CA  
Allan Renger, Southern Humboldt and Mendocino Counties Fisheries Management  
Supervisor, CDFW, Fortuna, CA

# North Central District Fishing Regulation Proposal: Central Coast Streams

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*NMFS*

*August 7, 2013*

## **I. Fishing Regulation Change Proposal**

**Central Coast Streams** – Stream closures: Special low-flow conditions pertaining to this proposal would apply to the following streams (north to south): Usal Creek, Cottaneva Creek, Ten Mile River, Noyo River, Big River, Albion River, Navarro River, Greenwood Creek, Elk Creek, Alder Creek, Brush Creek, Garcia River, Gualala River, Russian Gulch, Salmon Creek, Walker Creek, and Sonoma Creek.

### **Alternative 1: Extended low-flow restrictions based on the Navarro River stream gauge.**

1. Sonoma Creek (Sonoma County), and all streams tributary to the Pacific Ocean (and its bays) in Mendocino, Sonoma, and Marin counties, except for the Russian River.
  - a. **Minimum Flow**: From October 1 through April 1, **200 cfs** at the gauging station on the Navarro River along Hwy 128 (USGS 11468000; Mendocino County).
  - b. **Open Season and Special Regulations (general)**:
    - i. Only artificial lures with barbless hooks may be used from the forth Saturday in May through October 31 (current).
    - ii. Only barbless hooks may be used from November 1 through March 31 (current).

### **Alternative 2: Extended low-flow restrictions based on the SF Gualala River stream gauge.**

1. Sonoma Creek (Sonoma County), and all streams tributary to the Pacific Ocean (and its bays) in Mendocino, Sonoma, and Marin counties, except for the Russian River.
  - a. **Minimum Flow**: From October 1 through April 1, **150 cfs** at the gauging station on the SF Gualala River near Sea Ranch (USGS 11467510; Sonoma County).
  - b. **Open Season and Special Regulations (general)**:
    - i. Only artificial lures with barbless hooks may be used from the forth Saturday in May through October 31 (current).
    - ii. Only barbless hooks may be used from November 1 through March 31 (current).

# North Central District Fishing Regulation Proposal: Central Coast Streams

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## **II. Current Regulation, Problem ESA Impacted Species, and Justification**

- a) **Regulation in question:** Chapter 3. Article 4. Supplemental Regulations. 8.00. Low-Flow Restrictions (b) (1): The Sonoma Creek (Sonoma County), and all streams tributary to the Pacific Ocean (and its bays) in Mendocino, Sonoma, and Marin counties, except for the Russian River. Minimum Flow: 500 cfs at the gauging station on the main stem Russian River near Guerneville (Sonoma County). **Page 69.**
- b) **Problem:**
- Central Coast Stream low-flow conditions are poorly represented by the Russian River gauge near Guerneville due to the differences in geography, rainfall, hydrology, and the functional differences between natural and regulated flows
  - Central Coast low flow closures intended by the regulation, are not triggered, when low flow conditions exist, due to elevated and regulated flows in the Russian River
  - Lack of closure results in extensive angling pressure on Central Coast streams when salmonids are most vulnerable and stressed
  - Many Central Coast Streams are considered 'focus populations' for the recovery of ESA-listed salmonids and require improved protection during the annual steelhead season.
- c) **Identification of listed species being impacted that will benefit from change:** (T) CCC & NC steelhead, (T) CC Chinook, and (E) CCC coho salmon
- d) **Description of impact from regulation and rationale/justification for recommended change:** Currently, low-flow closures of Central Coast Streams are triggered by a 500 cfs threshold measured at the Russian River Hacienda/Guerneville gauge. Unlike adjacent Central Coast Streams, the Russian River contains two large reservoirs resulting in highly regulated stream flows. These regulated flows create altered hydrologic conditions that often contribute to prolonged stream flows of 500 cfs or greater at the Hacienda/Guerneville gauge during the wet season. Using the Russian River Hacienda/Guerneville gauge has resulted in other Central Coast Streams remaining open to fishing during extensive low-flow periods. This situation exposes adult salmon and steelhead to extremely high fishing pressure when they are most vulnerable and stressed. The Russian River was selected as the flow standard for Central Coast Streams due to a previous lack of secure funding for individual stream flow gauges in this area. At present, there are stream flow gauges on the Navarro (USGS 11468000), SF Gualala (USGS 11467510), and Garcia (stage, CDEC GRC) rivers. NMFS prefers the use of the Navarro River gauge because it has the longest and most consistent hydrologic recorded among unregulated Central Coast Streams and has secured funding. Alternatively, the SF Gualala stream gauge also provides adequate hydrologic information and potentially could suffice as representative flow conditions for Central Coast Streams. Therefore, for the purpose of regulating special low-flow fishing conditions across various Central Coast Streams, either the Navarro or SF Gualala river gauges would be more appropriate than the Russian River. A low-flow trigger of 200 cfs on the Navarro gauge or 150 cfs on the SF Gualala gauge is proposed. NMFS believes a low-flow trigger of 200 cfs on the Navarro or 150 cfs on the SF Gualala is substantiated by the data and will: (1) significantly improve the protection for ESA-listed salmonids during their upstream migrations to subsequent spawning destinations; and (2) provide adequate fishing opportunity. These recommendations are based on: 1) the experience of NMFS fisheries biologists, 2) their extensive local angling experience, 3) North Fork Gualala adult steelhead passage studies, and 4) collaboration with local angling groups.
- e) **Remaining issues:**
- Agreement on stream gauge station to use for low-flow trigger – SF Gualala vs. Navarro.
  - Angling boundaries. Anglers propose no low-flow closures on estuaries.
  - Low-flow trigger 100 vs. 150 cfs SF Gualala.
  - Outline steps/process for implementation.



# North Central District Fishing Regulation Proposal: Central Coast Streams

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## *III. Results*

- Navarro River gauge encompasses 303 mi<sup>2</sup> of watershed.
- South Fork Gualala gauge encompasses 161 mi<sup>2</sup> of watershed.
- NF Gualala gauge encompasses 47.1 mi<sup>2</sup> of watershed.
- North Gualala Water Company Site-Specific Studies Report prepared by Stillwater Sciences (Dec 2012) indicates at 60 cfs the lower reaches of NF Gualala become passable based on the Thompson (1972) criteria (p. 18).
- 150 cfs on the SF gauge ensures at least the same level of protection as current with the Hacienda gauge (RR) and additional protection during prolonged low-flow conditions (Table 1; Figures 1-3).
- 200 cfs on the Navarro gauge provides the most protection of low-flow triggers considered (Table 1; Figures 1-3).
- 100 cfs on the SF Gualala gauge and 500 cfs on the Hacienda gauge (RR) seem most similar when evaluating the number-of-fishing-days across years and potential low-flow triggers (Table 1).
- 150 cfs on the SF Gualala gauge and 200 cfs on the Navarro gauge seem most similar when evaluating the number-of-fishing-days across years and potential low-flow triggers (Table 1).
- All low-flow triggers provide very good protection during the fall months (Oct – Nov), but the Navarro provides the most across years (Table 1).
- 2012/13 Hacienda low-flow trigger for Central Coast Streams was the least protective of all years analyzed (Table 2, 3, 4, Figure 3).
- Stage height doesn't represent stream hydrology of the Garcia River or smaller streams well (Figure 4).
- 150 cfs on SF Gualala is roughly 200 cfs on the Navarro (Figure 5 a and b).
- Navarro vs. SF Gualala linear regression equation at 150 cfs on SF Gualala equals 209.9 cfs on the Navarro.
- SF vs. NF Gualala linear regression equation estimates at 150 cfs on SF Gualala equals 60.1 cfs on the NF Gualala gauge (Figure 6a). NF vs. SF Gualala estimates at 60 cfs NF equals 157.3 SF (Figure 6b).
- 6 fishing regulated Central Coast Streams are located north of the Navarro River; 7 to the south (Figure 7).
- 12 fishing regulated Central Coast Streams are located north of the Gualala River; 4 to the south (Figure 7).

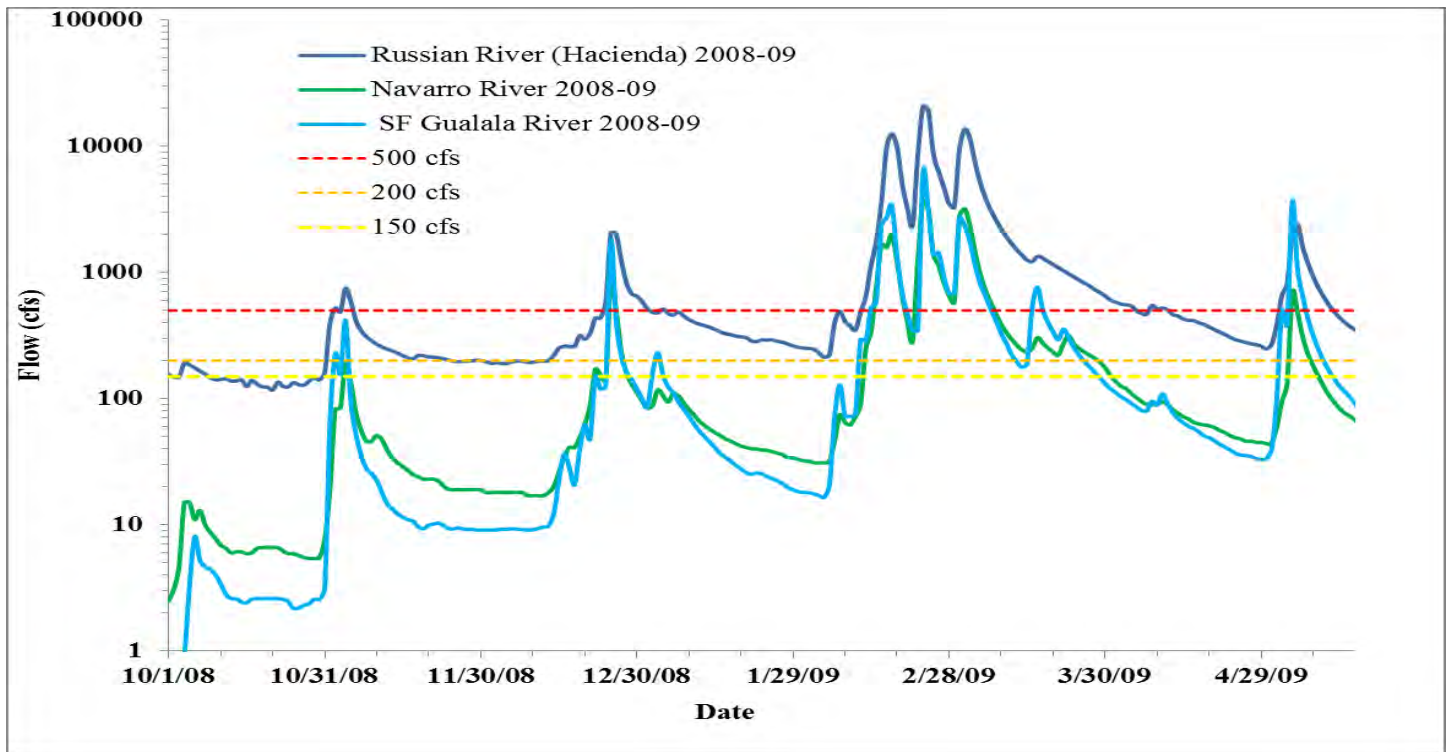
# North Central District Fishing Regulation Proposal: Central Coast Streams

**Table 1.** Comparison of number-of-fishing-days analysis for selected low-flow triggers using SF Gualala River, Navarro River, and Russian River at Hacienda gauges. Information includes the percentage and number-of-days estimated under potential low-flow triggers from each gauge. Highlighted green indicates years that experienced severe low-flow conditions. *Stream flow source: USGS daily average.*

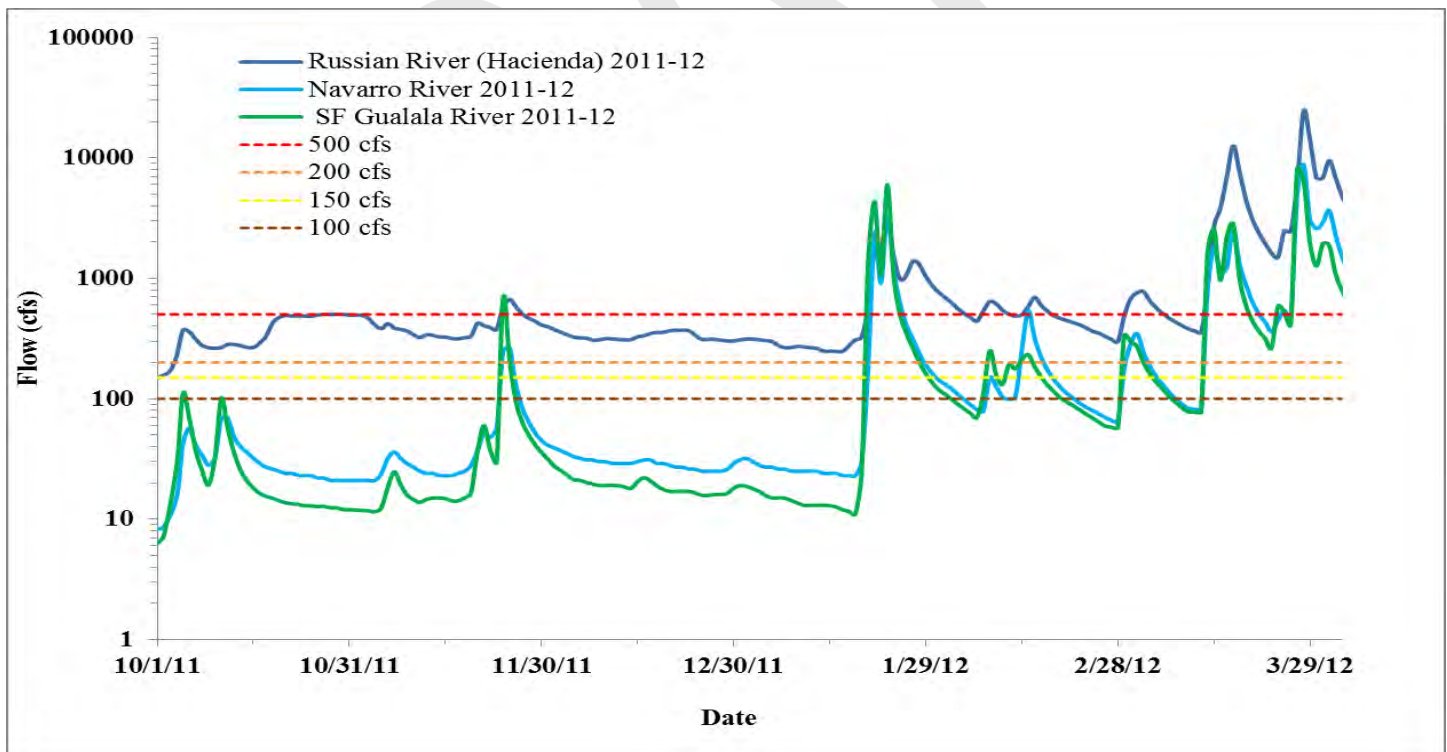
Flow (cfs)	Stream Gauge	2007-08*	2008-09	2009-10	2010-11	2011-12	2012 - 13
<b><u>September/October – November (61/91 d)</u></b>							
<100 [% (d)]	SF Gualala	100 (36*)	95 (58)	98 (60)	51 (31)	92 (56)	87 (53)
<150 [% (d)]	SF Gualala	100 (36*)	95 (58)	98 (60)	59 (36)	95 (58)	89 (54)
<200 [% (d)]	Navarro R.	100 (91)	100 (91)	100 (91)	76 (69)	98 (89)	96 (87)
<500 [% (d)]	Russian R.	100 (91)	97 (88)	100 (91)	56 (51)	92 (84)	89 (81)
<b><u>December (31 d)</u></b>							
< 100 [% (d)]	SF Gualala	35 (11)	71 (22)	68 (21)	0 (0)	100 (31)	0 (0)
<150 [% (d)]	SF Gualala	45 (14)	87 (27)	77 (24)	0 (0)	100 (31)	0 (0)
<200 [% (d)]	Navarro R.	71 (22)	90 (28)	94 (29)	0 (0)	100 (31)	0 (0)
<500 [% (d)]	Russian R	52 (16)	74 (23)	68 (21)	0 (0)	100 (31)	0 (0)
<b><u>January (31 d)</u></b>							
< 100 [% (d)]	SF Gualala	0 (0)	87 (27)	16 (5)	0 (0)	61 (19)	10 (3)
< 150 [% (d)]	SF Gualala	3 (1)	94 (29)	23 (7)	13 (4)	67 (21)	42 (13)
<200 [% (d)]	Navarro R.	16 (5)	100 (31)	29 (9)	13 (4)	74 (23)	42 (13)
<500 [% (d)]	Russian R	0 (0)	94 (29)	23 (7)	0 (0)	61 (19)	0 (0)
<b><u>February – March (59/60 d)</u></b>							
< 100 [% (d)]	SF Gualala	18 (11)	15 (9)	0 (0)	5 (3)	33 (20)	93 (55)
< 150 [% (d)]	SF Gualala	32 (19)	23 (14)	0 (0)	20 (12)	48 (29)	97 (57)
<200 [% (d)]	Navarro R.	32 (19)	24 (14)	0 (0)	22 (13)	57 (34)	95 (56)
<500 [% (d)]	Russian R	0 (0)	19 (11)	0 (0)	0 (0)	37 (22)	10 (6)

\*Flow data started 26 October 2007

## North Central District Fishing Regulation Proposal: Central Coast Streams

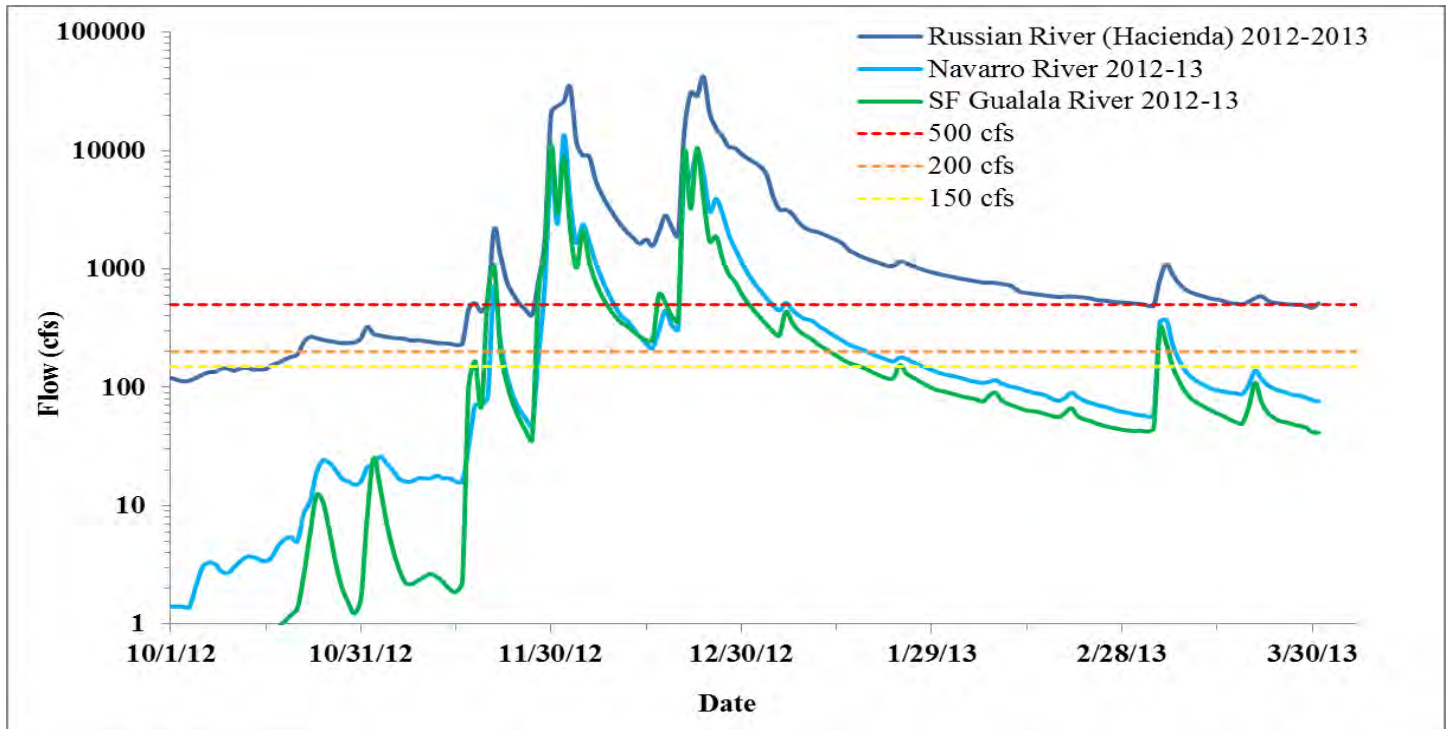


**Figure 1.** Hydrograph comparison of Russian (Hacienda), SF Gualala, and Navarro rivers 2008/09.

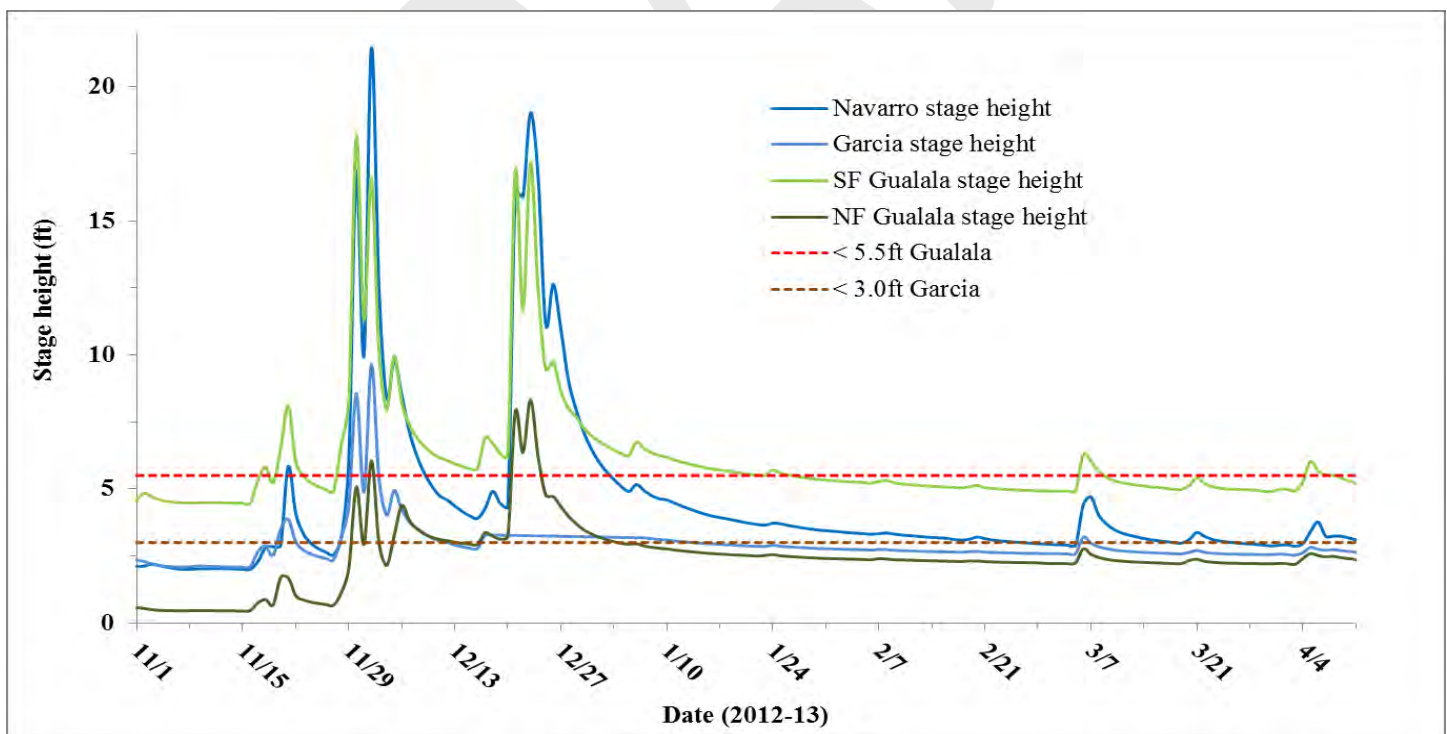


**Figure 2.** Hydrograph comparison of Russian (Hacienda), SF Gualala, and Navarro rivers 2011/12.

## North Central District Fishing Regulation Proposal: Central Coast Streams



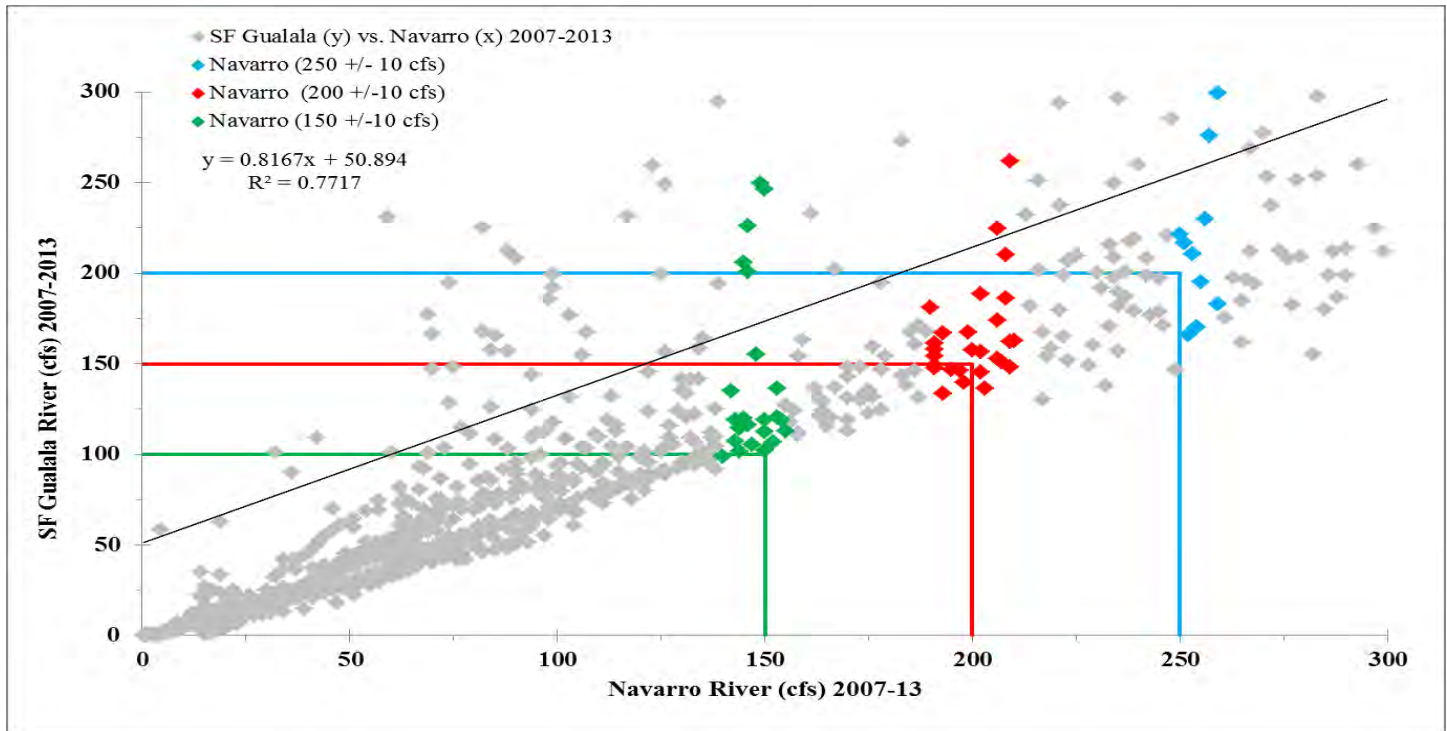
**Figure 3.** Hydrograph comparison of Russian near Guerneville (Hacienda), SF Gualala, and Navarro rivers 2012/13.



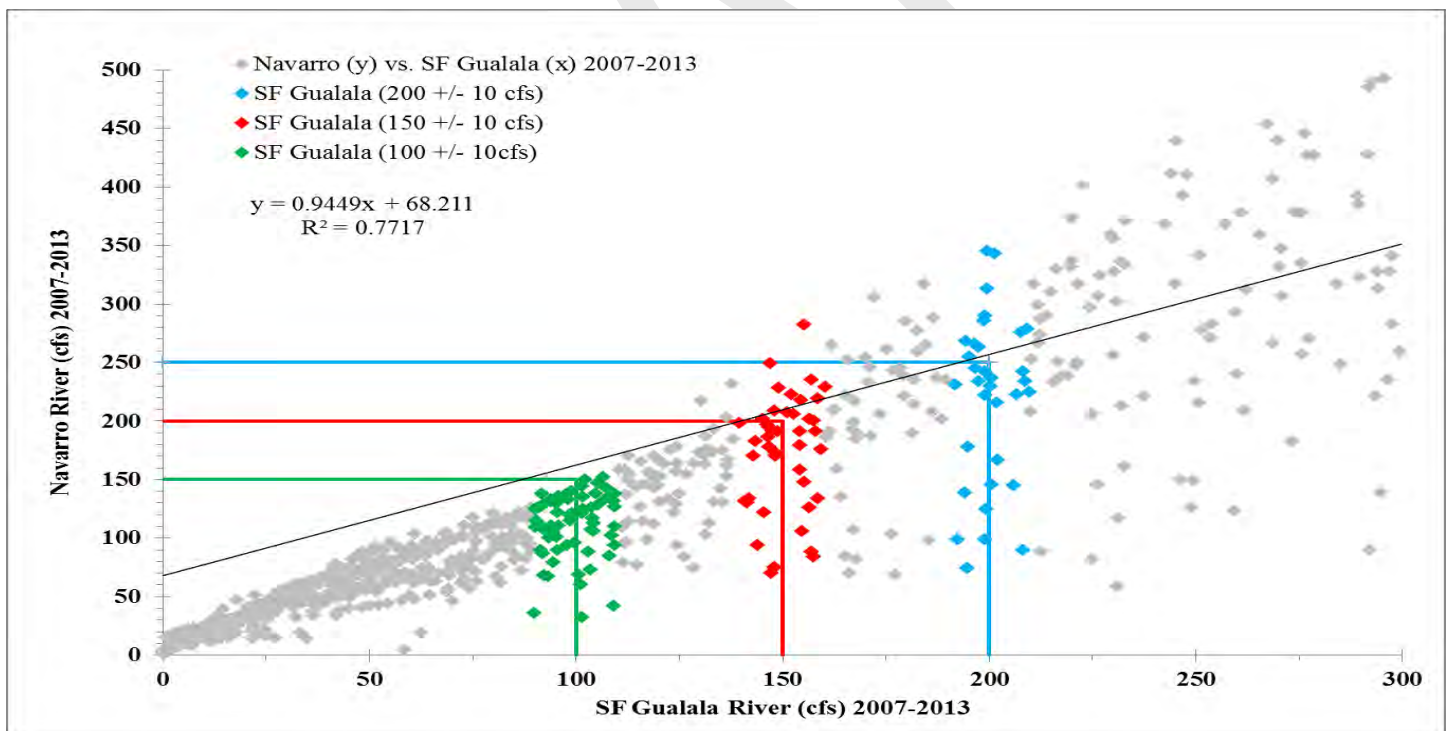
**Figure 4.** Comparison of stage height gauges on various Mendocino streams 2012-13. Stage elevations of 5.5 and 3.0 feet are considered severely low-flow fishing conditions on the Gualala and Garcia rivers, respectively.



## North Central District Fishing Regulation Proposal: Central Coast Streams



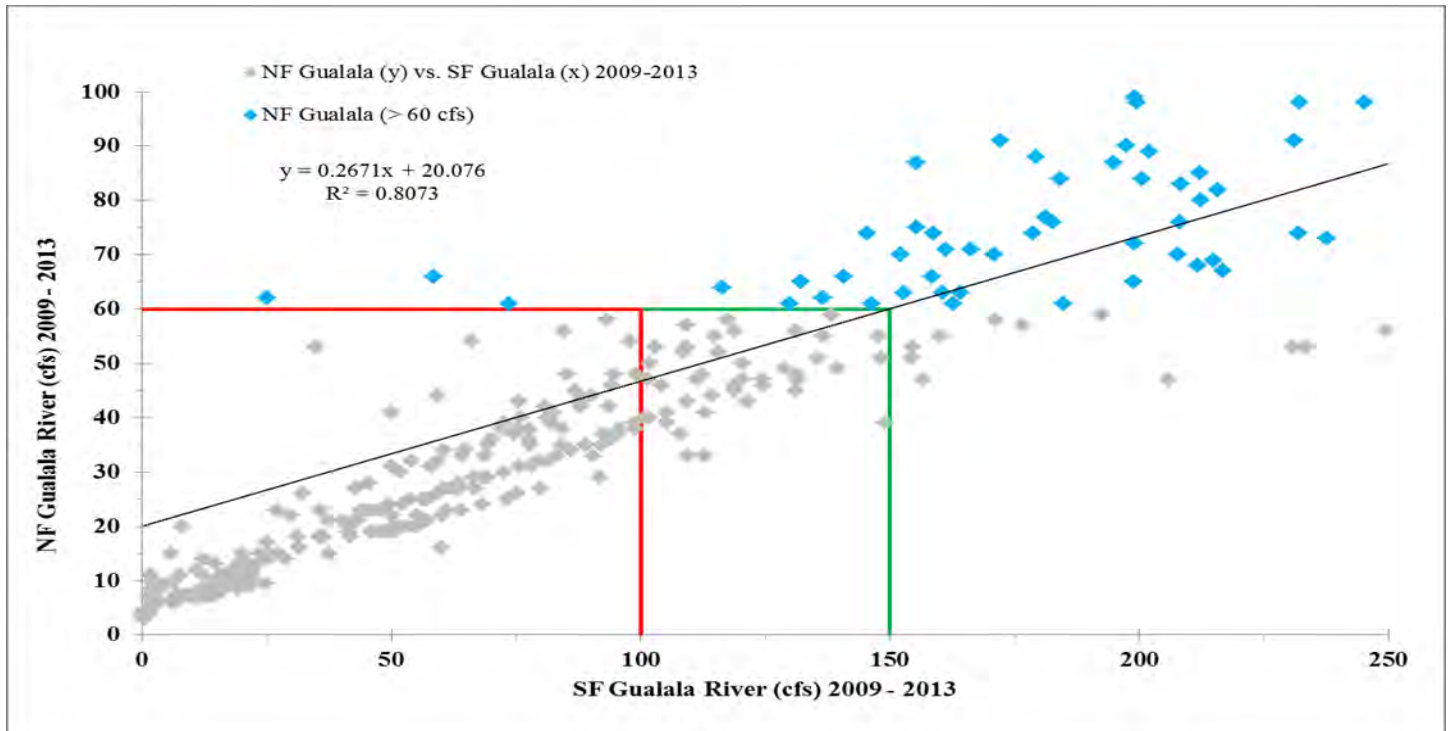
(a)



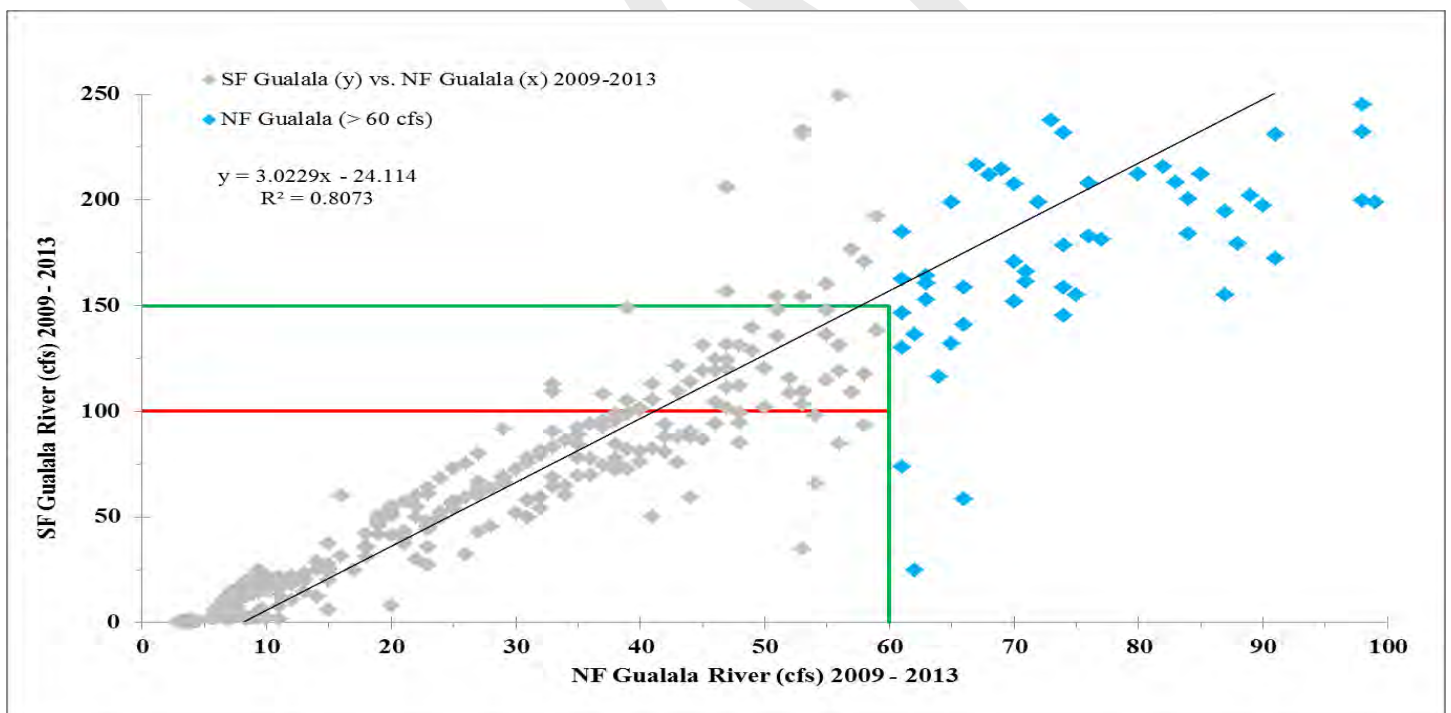
(b)

**Figure 5.** Linear regression comparisons (a,b) of SF Gualala River vs. Navarro River stream gauges using daily average flows during the same period of record (October 2007 through May 2013).

## North Central District Fishing Regulation Proposal: Central Coast Streams



(a)



(b)

**Figure 6.** Liner regression comparisons (a,b) of the NF and SF Gualala River stream gauges using daily average flows during the same period of record (October 2009 through March 2013).



## North Central District Fishing Regulation Proposal: Central Coast Streams

**Table 2.** *SF Gualala River gauge 2007/08 – 2012/13.* Information includes the percentage and number of days estimated under potential low-flow triggers using the SF Gualala gauge. SF Gualala stream flow information was only available from 26 October 2007 to current. Highlighted green indicates years that experienced severe low-flow conditions. Highlighted blue indicates a proposed low-flow trigger based on the SF Gualala gauge. *Stream flow source: USGS daily average.* \*Flow data started 26 October 2007.

Flow (cfs)	Year						% Total (d)
	2007-08*	2008-09	2009-10	2010-11	2011-12	2012 - 13	
<b><i>October – November (61 d)</i></b>							
< 100 [% (d)]	100 (36*)	95 (58)	98 (60)	51 (31)	92 (56)	87 (53)	86 (294)
<150 [% (d)]	100 (36*)	95 (58)	98 (60)	59 (36)	95 (58)	89 (54)	89 (302)
< 200 [% (d)]	100 (36*)	97 (59)	100 (61)	64 (39)	95 (58)	90 (55)	90 (308)
<250 [% (d)]	100 (36*)	98 (60)	100 (61)	70 (43)	97 (59)	92 (56)	92 (315)
<b><i>December (31 d)</i></b>							
< 100 [% (d)]	35 (11)	71 (22)	68 (21)	0 (0)	100 (31)	0 (0)	46 (85)
<150 [% (d)]	45 (14)	87 (27)	77 (24)	0 (0)	100 (31)	0 (0)	52 (96)
< 200 [% (d)]	63 (19)	90 (28)	81 (25)	6 (2)	100 (31)	0 (0)	56 (105)
< 250 [% (d)]	71 (22)	94 (29)	87 (27)	6 (2)	100 (31)	3 (1)	60 (112)
<b><i>January (31 d)</i></b>							
< 100 [% (d)]	0 (0)	87 (27)	16 (5)	0 (0)	61 (19)	10 (3)	29 (54)
< 150 [% (d)]	3 (1)	94 (29)	23 (7)	13 (4)	67 (21)	42 (13)	40 (75)
< 200 [% (d)]	23 (7)	97 (30)	26 (8)	29 (9)	74 (23)	61 (19)	52 (96)
< 250 [% (d)]	26 (8)	100 (31)	26 (8)	48 (15)	74 (23)	68 (21)	57 (106)
<b><i>February – March (59/60 d)</i></b>							
< 100 [% (d)]	18 (11)	15 (9)	0 (0)	5 (3)	33 (20)	93 (55)	27 (98)
< 150 [% (d)]	32 (19)	23 (14)	0 (0)	20 (12)	48 (29)	97 (57)	36 (131)
< 200 [% (d)]	40 (24)	33 (20)	5 (3)	22 (13)	58 (35)	97 (57)	42 (152)
< 250 [% (d)]	52 (31)	37 (22)	17 (10)	22 (13)	63 (38)	98 (58)	48 (172)
< 100 % Total (d)	37 (58)	63 (116)	47 (86)	19 (34)	69 (126)	61 (111)	20 (531)
< 150 % Total (d)	44 (70)	70 (128)	50 (91)	28 (52)	76 (139)	68 (124)	22 (604)
< 200 % Total (d)	54 (86)	75 (137)	54 (97)	34 (63)	80 (147)	72 (131)	24 (661)
< 250 % Total (d)	61 (97)	78 (142)	58 (106)	40 (73)	83 (151)	74 (136)	26 (705)

## North Central District Fishing Regulation Proposal: Central Coast Streams

**Table 3.** *Navarro River gauge 2003/04 – 2012/13.* Information includes the percentage and number of days estimated under potential low-flow triggers using the Navarro River stream gauge. Highlighted green indicates years that experienced severe low-flow conditions. Highlighted blue indicates a proposed low-flow trigger based on the Navarro River gauge. *Stream flow source: USGS daily average.*

Flow (cfs)	Year										% Total (d)
	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012/13	
<b><u>September – November (91 d)</u></b>											
< 100 [% (d)]	100 (91)	98 (89)	96 (87)	100 (91)	100 (91)	98 (89)	100 (91)	69 (63)	97 (88)	93 (85)	95 (865)
<150 [% (d)]	100 (91)	100 (91)	97 (88)	100 (91)	100 (91)	99 (90)	100 (91)	75 (68)	98 (89)	95 (86)	96 (876)
< 200 [% (d)]	100 (91)	100 (91)	97 (88)	100 (91)	100 (91)	100 (91)	100 (91)	76 (69)	98 (89)	96 (87)	97 (879)
<250 [% (d)]	100 (91)	100 (91)	99 (90)	100 (91)	100 (91)	100 (91)	100 (91)	79 (72)	99 (90)	97 (88)	97 (886)
<b><u>December (31 d)</u></b>											
< 100 [% (d)]	7 (2)	45 (14)	7 (2)	36 (11)	61 (19)	71 (22)	77 (24)	0 (0)	100 (31)	0 (0)	40 (125)
<150 [% (d)]	10 (3)	55 (17)	29 (9)	45 (14)	68 (21)	81 (25)	90 (28)	0 (0)	100 (31)	0 (0)	48 (148)
< 200 [% (d)]	13 (4)	58 (18)	39 (12)	52 (16)	71 (22)	90 (28)	94 (29)	0 (0)	100 (31)	0 (0)	52 (160)
< 250 [% (d)]	16 (5)	65 (20)	42 (13)	52 (16)	77 (24)	94 (29)	94 (29)	3 (1)	100 (31)	7(2)	55 (170)
<b><u>January (31 d)</u></b>											
< 100 [% (d)]	0 (0)	0 (0)	0 (0)	57 (17)	7 (2)	87 (27)	16 (5)	0 (0)	61 (19)	0 (0)	23 (70)
< 150 [% (d)]	0 (0)	0 (0)	0 (0)	68 (21)	7 (2)	100 (31)	26 (8)	0 (0)	65 (20)	13 (4)	28 (86)
< 200 [% (d)]	0 (0)	0 (0)	0 (0)	84 (26)	16 (5)	100 (31)	29 (9)	13 (4)	74 (23)	42 (13)	34 (106)
< 250 [% (d)]	0 (0)	10 (3)	0 (0)	97 (30)	29 (9)	100 (31)	32 (10)	29 (9)	77 (24)	55 (17)	43 (133)
<b><u>February – March (59/60 d)</u></b>											
< 100 [% (d)]	0 (0)	0 (0)	0 (0)	15 (9)	0 (0)	19 (11)	0 (0)	0 (0)	27 (16)	61 (36)	12 (72)
< 150 [% (d)]	0 (0)	0 (0)	0 (0)	32 (19)	18 (11)	19 (11)	0 (0)	14 (8)	50 (30)	93 (55)	23 (134)
< 200 [% (d)]	8 (5)	9 (5)	0 (0)	39 (23)	32 (19)	24 (14)	0 (0)	22 (13)	57 (34)	95 (56)	29 (169)
< 250 [% (d)]	18 (11)	22 (13)	0 (0)	44 (26)	48 (29)	37 (22)	2 (1)	24 (14)	60 (36)	97 (57)	33 (209)
< 100 % Total (d)	44 (93)	49 (103)	42 (89)	60 (128)	53 (112)	70 (149)	57 (120)	30 (63)	72 (154)	57 (121)	54 (1132)
< 150 % Total (d)	44 (94)	51 (108)	46 (97)	68 (145)	59 (125)	74 (157)	60 (127)	36 (76)	80 (170)	68 (145)	59 (1244)
< 200 % Total (d)	47 (100)	54 (114)	47 (100)	74 (156)	64 (137)	77 (164)	61 (129)	41 (86)	83 (177)	74 (156)	62 (1319)
< 250 % Total (d)	50 (107)	60 (127)	49 (103)	77 (163)	72 (153)	82 (173)	62 (131)	45 (96)	85 (181)	77 (164)	66 (1398)

## North Central District Fishing Regulation Proposal: Central Coast Streams

**Table 4.** *Russian River at Hacienda/Guerneville gauge 2004/05 – 2012/13.* Information includes the percentage and number of days estimated under potential low-flow triggers using Hacienda stream gauge. Highlighted green indicates years that experienced severe low-flow conditions. Highlighted blue indicates the current low-flow trigger for coastal streams based on the Hacienda stream gauge. *Stream flow source: USGS daily average.*

Flow (cfs)	Year									% Total (d)
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	
<u>September – November (91 d)</u>										
< 250 [% (d)]	52 (47)	60 (55)	71 (65)	86 (78)	88 (80)	85 (77)	46 (42)	37 (34)	73 (66)	66 (544)
< 300 [% (d)]	57 (52)	82 (75)	78 (71)	100 (91)	91 (83)	95 (86)	47 (43)	53 (48)	85 (77)	78 (628)
< 350 [% (d)]	78 (71)	91 (83)	88 (80)	100 (91)	93 (85)	96 (87)	47 (43)	62 (56)	85 (77)	83 (679)
< 500 [% (d)]	97 (88)	92 (84)	100 (91)	100 (91)	97 (88)	100 (91)	56 (51)	92 (84)	89 (81)	91 (749)
<u>December (31 d)</u>										
< 250 [% (d)]	0 (0)	0 (0)	0 (0)	0 (0)	45 (14)	16 (5)	0 (0)	0 (0)	0 (0)	7 (19)
< 300 [% (d)]	0 (0)	0 (0)	0 (0)	16 (5)	61 (19)	35 (11)	0 (0)	0 (0)	0 (0)	13 (35)
< 350 [% (d)]	13 (4)	0 (0)	16 (5)	23 (7)	68 (21)	39 (12)	0 (0)	74 (23)	0 (0)	24 (68)
< 500 [% (d)]	19 (6)	19 (6)	32 (10)	52 (16)	74 (23)	68 (21)	0 (0)	100 (31)	0 (0)	41 (113)
<u>January (31 d)</u>										
< 250 [% (d)]	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	13 (4)	0 (0)	1 (4)
< 300 [% (d)]	0 (0)	0 (0)	0 (0)	0 (0)	35 (11)	0 (0)	0 (0)	42 (13)	0 (0)	9 (24)
< 350 [% (d)]	0 (0)	0 (0)	3 (1)	0 (0)	55 (17)	0 (0)	0 (0)	61 (19)	0 (0)	13 (37)
< 500 [% (d)]	0 (0)	0 (0)	42 (13)	0 (0)	94 (29)	23 (7)	0 (0)	61 (19)	0 (0)	24 (68)
<u>February – March (59/60 d)</u>										
< 250 [% (d)]	0 (0)	0 (0)	0(0)	0 (0)	8 (5)	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)
< 300 [% (d)]	0 (0)	0 (0)	0(0)	0 (0)	8 (5)	0 (0)	0 (0)	2 (1)	0 (0)	1 (6)
< 350 [% (d)]	0 (0)	0 (0)	8 (5)	0 (0)	10 (6)	0 (0)	0 (0)	5 (3)	0 (0)	3 (14)
< 500 [% (d)]	0 (0)	0 (0)	14 (8)	0 (0)	19 (11)	0 (0)	0 (0)	37 (22)	10 (6)	9 (47)
< 500 [% (d)]	44 (94)	42 (90)	58 (122)	50 (107)	71 (151)	56 (119)	24 (51)	74 (156)	41 (87)	51 (977)
< 350 % Total (d)	35 (75)	39 (83)	43 (91)	46 (98)	61 (129)	47 (99)	20 (43)	47 (101)	36 (77)	42 (798)
< 300 % Total (d)	24 (52)	35 (75)	33 (71)	45 (96)	55 (118)	46 (97)	20 (43)	29 (62)	36 (77)	37 (703)
< 250 % Total (d)	22 (47)	26 (55)	31 (65)	37 (78)	47 (99)	39 (82)	20 (42)	24 (50)	31 (66)	30 (572)



# North Central District Fishing Regulation Proposal: Central Coast Streams



Figure 7. Streams and stream reaches included in this proposal.



# North Central District: Central Coast Streams



# North Central District: Central Coast Streams

## Current low-flow fishing regulation:

Chapter 3. Article 4. Supplemental Regulations. 8.00. Low-Flow Restrictions (b) (1): *From October 1 through April 1....*The Sonoma Creek (Sonoma County), and all streams tributary to the Pacific Ocean (and its bays) in Mendocino, Sonoma, and Marin counties, except for the Russian River. *Minimum Flow: 500 cfs* at the gauging station on the *main stem Russian River* near Guerneville (Sonoma County). Page 69.



# Need for fishing regulation change:

1. Minimize impacts to listed salmonids associated with angling
2. Central Coast Stream low-flow conditions (unregulated) are poorly represented by the Russian River gauge near Guerneville (regulated)
3. Aid law enforcement when poaching is most likely to occur – severe low-flow conditions
4. Stakeholder proposal – public concern
5. Many Central Coast Streams are ‘focus populations’ for ESA recovery plans

## Gualala stakeholders: Proposed fishing regulation change – Gualala River

April 4, 2013

**A coalition of stakeholders urges the California Fish & Game Commission to enact an emergency regulation change to amend the CA Central Coast Streams' Low-Flow Closure trigger**

### **The Coalition:**

We have formed a diverse coalition of support for the proposed solution below – including local bait, gear, and fly fishermen, local businesses and river groups, and regional nonprofits. Representatives from each of these stakeholder groups are prepared to give comments either in person or in writing at the upcoming June 26-27, 2013 Commission meeting in Sacramento, if necessary.

### **The Problem:**

Currently, the low flow closure for central coast streams is predicated on the Russian River gauge near Guerneville falling below 500cfs (CCR, T14, Ch 3, Art 4, Sect 8, part (b) 1). The problem is that the Russian's flow is artificially inflated by dam releases from Lake Mendocino and Lake Sonoma. We have had two winters in a row with more than a month long drought in the middle of winter steelhead season. In both years the coastal streams have dropped down to mere trickles, yet have remained open to fishing because dam releases keep the Russian up above the 500cfs trigger. The ESA-listed fish are forced to congregate into a handful of shrinking holes below restricted passage areas, and then subject to increased angling pressure.

Basing the central coast low-flow closure trigger on the Russian River does not make much sense, particularly when there are reliable gauges on more representative central coast streams that lack dams or diversions. The problem is clearly illustrated by comparing the historical flow data for the Russian and Gualala Rivers during the last two winter steelhead seasons, as seen in Graphs 1 and 2.

### **Proposed Solution:**

We recommend amending the central coast streams' low flow closure to be based on the South Fork Gualala River gauge at 100cfs. When this gauge falls below 100, fish migration is impeded on the Gualala River as well as the other central coast streams. Unlike the Russian River, the South Fork Gualala River is a consistently reliable and representative indicator for the central coast streams.

There has also been a recent surge of conservation momentum in the Gualala watershed. Just last month, conservation groups purchased 20,000 acres of land covering prime spawning habitat on the Gualala River. It's the largest conservation purchase by acreage in the county and one of the largest along the north coast in years. Establishing an effective and appropriate low flow trigger for the river will bolster the fish conservation efforts of these groups and others.

### **Stakeholders**

The following stakeholders agree with the problem, proposed solution, and supporting facts as described in the previous pages:

**Dan Reno**  
California Fish & Game Warden,  
Mendocino County, Retired  
Longtime Gualala Area Resident

**Doug DeRoy**  
Central Coast Fly Fisherman  
Longtime Bay Area Resident

**Greg Warner**  
South Coast Fire Chief, Gualala, CA  
President, Gualala Fish Project (7 yrs)  
Bait & Gear Fisherman  
Lifetime Gualala resident

**Native Fish Society**  
Nonprofit advocate for the recovery  
of wild, native fish and stewardship  
of the habitats that sustain them.  
221 Molalla Ave., Suite 109  
Oregon City, OR 97045

**Yvette White**  
Owner, Gualala Sport & Tackle,  
Gualala, CA  
Longtime Gualala area resident

**Mark Sherwood**  
River Steward Program Director,  
Native Fish Society

**Mark Clark**  
VP, Gualala Fish Project (7 yrs)  
Bait & Gear Fisherman  
Lifetime Gualala resident

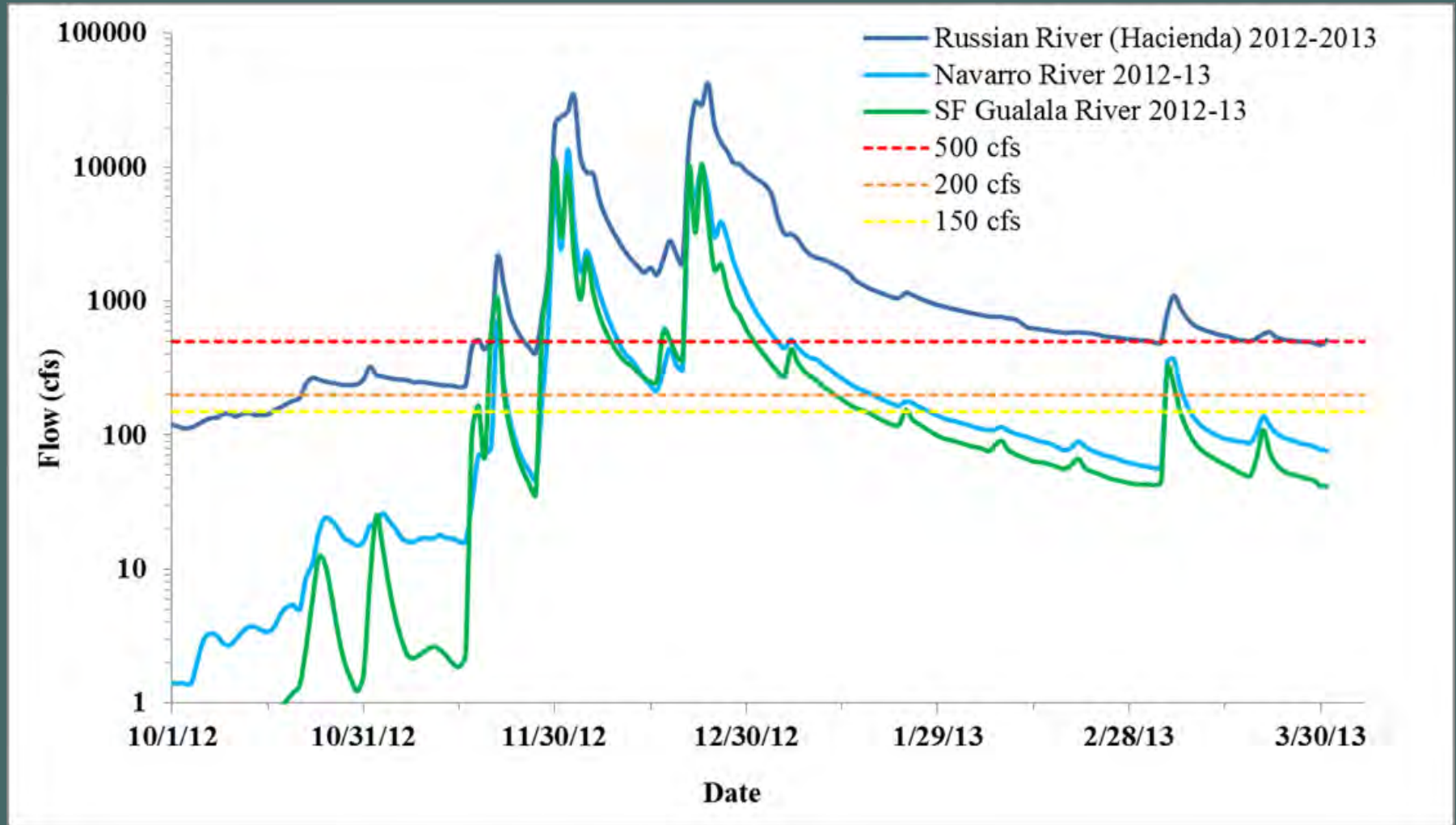
**Mike Simila**  
Bait & Gear Fisherman  
Volunteer, Gualala Fish Project  
Lifetime Gualala resident

**John Bennett**  
Registered Professional Forester  
Bait & Gear Fisherman  
Longtime Gualala area resident

**Jason Spangler**  
Bait & Gear Fisherman  
Lifetime Gualala resident

**Walter Jorgensen**  
Central Coast Fly Fisherman  
Lifetime Bay Area Resident

## Example: Hacienda gauge vs. Mendo gauged streams



Hydrograph comparison of Russian near Guerneville (Hacienda), SF Gualala, and Navarro rivers 2012/13.

# North Central District: Central Coast Streams



Sonoma Creek  
not shown



# Goals of fishing regulation change:

1. Enhance protection of listed salmonids during low-flow conditions - when they are most stressed and vulnerable
2. Utilize unregulated stream flow gauges that best represent Central Coast Streams
3. Simplify and attempt to make fishing regulations consistent
4. Provide and maintain quality angling opportunities – recognize windows of fishing opportunity to keep people interested in fishing
5. Use existing data to support a fishing regulation change



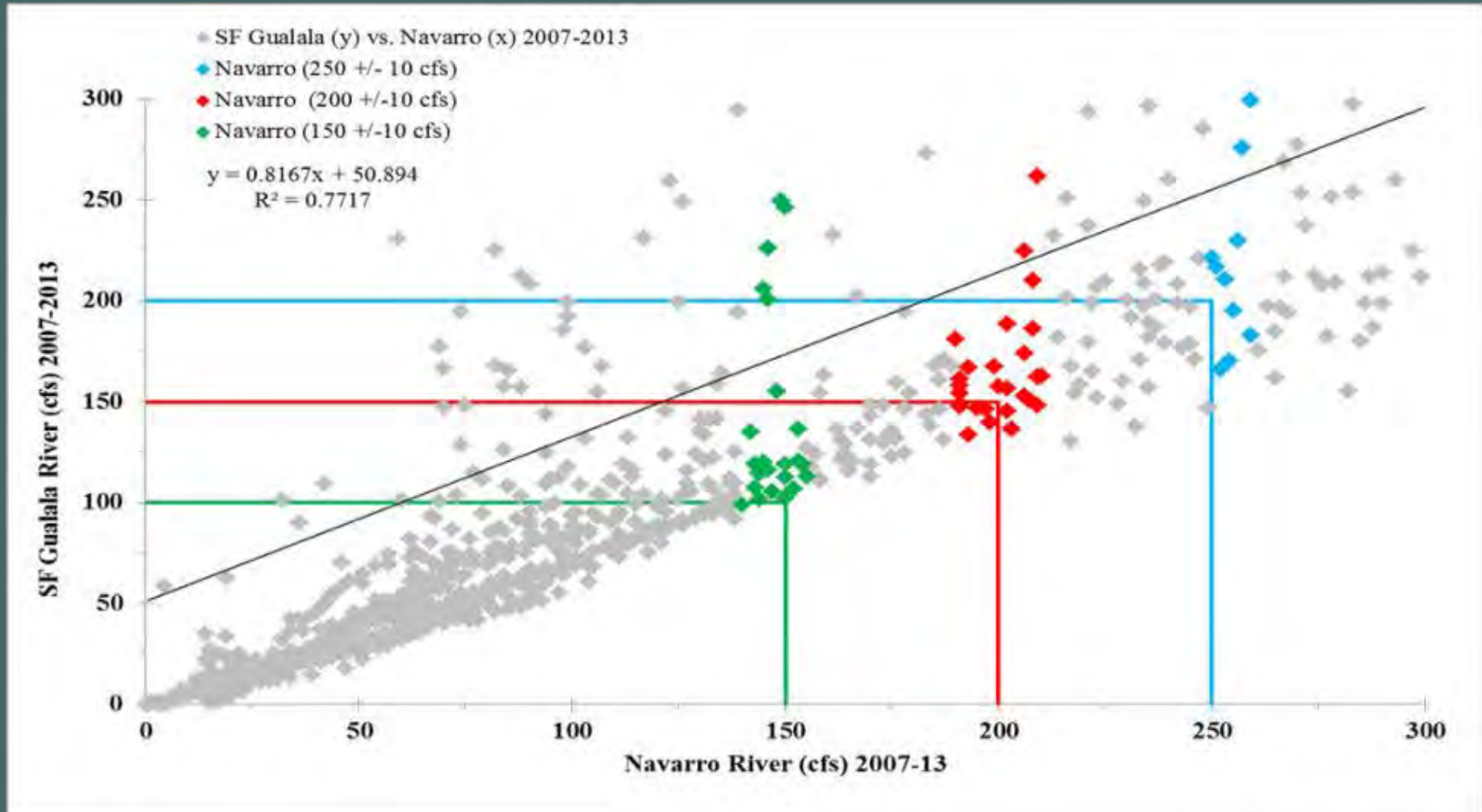
# Evaluation of existing low-flow regulation = fishing regulation change proposal

## Information used:

1. Hydrology data
2. Site specific passage report
3. Steelhead report card data
4. Field observations
5. Local angler knowledge and expertise (outreach)



## Example: SF Gualala River vs. Navarro River



Liner regression comparisons of SF Gualala River vs. Navarro River stream gauges using daily average flows during the same period of record (October 2007 through May 2013).



# Example: Site specific information

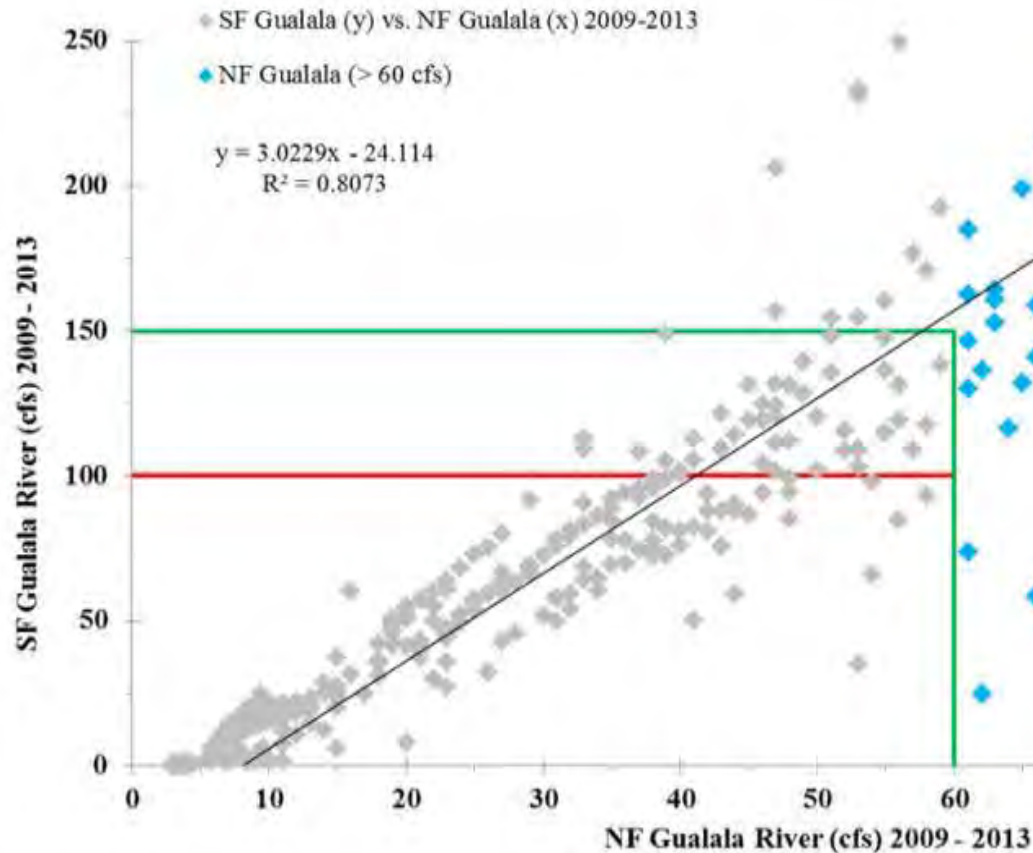


Table 3-13. Results of adult fish passage evaluation based on adult passage criteria in Thompson (1972).

Cross-section	Adult passage during discharge as measured at USGS gage			
	60 cfs	40 cfs	20 cfs	10 cfs
U1a	Passable	Not passable <sup>1</sup>	Not passable <sup>1</sup>	Passable
U1 <sup>2</sup>	Passable	nd	nd	nd
U1b <sup>3</sup>	nd	Not passable <sup>1</sup>	Not passable	Not passable
U2	Passable	Passable	Not passable	Not passable
D1	Passable	Not passable <sup>1</sup>	Not passable	Not passable
D1b <sup>3</sup>	nd	Not passable	Not passable	Not passable
D2	Not passable <sup>1</sup>	Not passable	Not passable	Not passable

<sup>1</sup> Criteria achieved for percentage of continuous width, but not for percentage of total width.

<sup>2</sup> This cross-section was dropped from the analysis due to lack of riffle development at the 40 cfs flow level.

<sup>3</sup> No 60 cfs data since this cross-section was added to the analysis due to formation of a riffle at 40 cfs.

nd = no data

Liner regression comparisons of the NF and SF Gualala River stream gauges using daily average flows during the same period of record (October 2009 through March 2013).

# Number of days comparison potential gauge sites:

Flow (cfs)	Stream Gauge	Year						
		2007-08*	2008-09	2009-10	2010-11	2011-12	2012 - 13	
		<u>September/October – November (61/91 d)</u>						
	<100 [% (d)]	SF Gualala	100 (36*)	95 (58)	98 (60)	51 (31)	92 (56)	87 (53)
	<150 [% (d)]	SF Gualala	100 (36*)	95 (58)	98 (60)	59 (36)	95 (58)	89 (54)
	<200 [% (d)]	Navarro R.	100 (91)	100 (91)	100 (91)	76 (69)	98 (89)	96 (87)
	<500 [% (d)]	Russian R.	100 (91)	97 (88)	100 (91)	56 (51)	92 (84)	89 (81)
		<u>December (31 d)</u>						
	< 100 [% (d)]	SF Gualala	35 (11)	71 (22)	68 (21)	0 (0)	100 (31)	0 (0)
	<150 [% (d)]	SF Gualala	45 (14)	87 (27)	77 (24)	0 (0)	100 (31)	0 (0)
	<200 [% (d)]	Navarro R.	71 (22)	90 (28)	94 (29)	0 (0)	100 (31)	0 (0)
	<500 [% (d)]	Russian R	52 (16)	74 (23)	68 (21)	0 (0)	100 (31)	0 (0)
		<u>January (31 d)</u>						
	< 100 [% (d)]	SF Gualala	0 (0)	87 (27)	16 (5)	0 (0)	61 (19)	10 (3)
	< 150 [% (d)]	SF Gualala	3 (1)	94 (29)	23 (7)	13 (4)	67 (21)	42 (13)
	<200 [% (d)]	Navarro R.	16 (5)	100 (31)	29 (9)	13 (4)	74 (23)	42 (13)
	<500 [% (d)]	Russian R	0 (0)	94 (29)	23 (7)	0 (0)	61 (19)	0 (0)
		<u>February – March (59/60 d)</u>						
	< 100 [% (d)]	SF Gualala	18 (11)	15 (9)	0 (0)	5 (3)	33 (20)	93 (55)
< 150 [% (d)]	SF Gualala	32 (19)	23 (14)	0 (0)	20 (12)	48 (29)	97 (57)	
<200 [% (d)]	Navarro R.	32 (19)	24 (14)	0 (0)	22 (13)	57 (34)	95 (56)	
<500 [% (d)]	Russian R	0 (0)	19 (11)	0 (0)	0 (0)	37 (22)	10 (6)	

\*Flow data started 26 October 2007

# Preliminary Results:

1. All low-flow triggers provide very good protection during the fall months (Oct – Nov), but the Navarro provides the most across years.
2. 200 cfs on the Navarro gauge provides the most protection of low-flow triggers considered
3. 150 cfs on the SF Gualala gauge and 200 cfs on the Navarro gauge seem most similar when evaluating the number-of-fishing-days across years and potential low-flow triggers.
4. 100 cfs on the SF Gualala gauge and 500 cfs on the Hacienda gauge (RR) seem most similar when evaluating the number-of-fishing-days across years and potential low-flow triggers.
5. Navarro vs. SF Gualala linear regression equation at 150 cfs on SF Gualala equals 209.9 cfs on the Navarro.
6. SF vs. NF Gualala linear regression equation estimates at 150 cfs on SF Gualala equals 60.1 cfs on the NF Gualala gauge. NF vs. SF Gualala estimates at 60 cfs NF equals 157.3 SF.

\* Questions regarding the protection of smaller Central Coast Streams (Garcia etc.)

\*\* Need further evaluation of steelhead report card catch data

# Proposed alternatives:

**Alternative (1):** Extended low-flow restrictions based on the Navarro River stream gauge.

Sonoma Creek (Sonoma County), and all streams tributary to the Pacific Ocean (and its bays) in Mendocino, Sonoma, and Marin counties, except for the Russian River.

- **Minimum Flow:** From October 1 through April 1, 200 cfs at the gauging station on the Navarro River along Hwy 128 (USGS 11468000; Mendocino County).
- 

**Alternative (2):** Extended low-flow restrictions based on the SF Gualala River stream gauge.

Sonoma Creek (Sonoma County), and all streams tributary to the Pacific Ocean (and its bays) in Mendocino, Sonoma, and Marin counties, except for the Russian River.

- **Minimum Flow:** From October 1 through April 1, 150 cfs at the gauging station on the SF Gualala River near Sea Ranch (USGS 11467510; Sonoma County).
- 

**Alternative (3):** Use two gauges (SF Gualala & Navarro) to represent north and south streams pertaining to this proposal.

## Other efforts:



*Officials: Poaching along Garcia River threatens fish recovery*



Overlooking the Garcia River in Mendocino County, Department of Fish and Game Warden Don Powers, right and a federal agent, left, who declined to be identified, watch for poachers Wednesday, Feb. 27, 2013. \$20 million in government and private donations for restoration of the Garcia fishery are endangered due to the poaching of the migrating fish. ((Kent Porter / Press Democrat))

## *Stornetta Case*



Like

Mendocino County District Attorney · 174 like this

June 18 at 6:00pm ·

SUPERIOR COURT: Ukiah: No contest pleas by Kyle Edward Stornetta, age 32 of Manchester, were entered on the record in court this morning to charges that Stornetta had violated marijuana laws and had unlawfully taken/possessed wild steelhead. Placed on two years probation, Stornetta was ordered to serve 45 days in the county jail, and he must also perform 200 hours community service within the next year. Other sentencing highlights included an order that Stornetta pay fines and fees of over \$5,000 calculated for the Fish and Wildlife violation, as well as restitution to the Sheriff's Office for marijuana eradication. Stornetta's sport fishing license was revoked for a year, and he was required to waive his 4th Amendment right regarding searches of his person, his vehicle, and any property under his control during the next two years. Seized equipment used to facilitate the cultivation of marijuana was ordered forfeited and destroyed.

## *Manchester-Point Arena Band of Pomo Indians*

**DRAFT**  
**RESOLUTION**  
**OF THE BUSINESS COMMITTEE**  
**OF THE MANCHESTER BAND OF POMO INDIANS**  
**FOR PROTECTION OF GARCIA RIVER**

ENDANGERED SPECIES



# I. Russian River: Sport fishing low-flow survey 2/16/2016

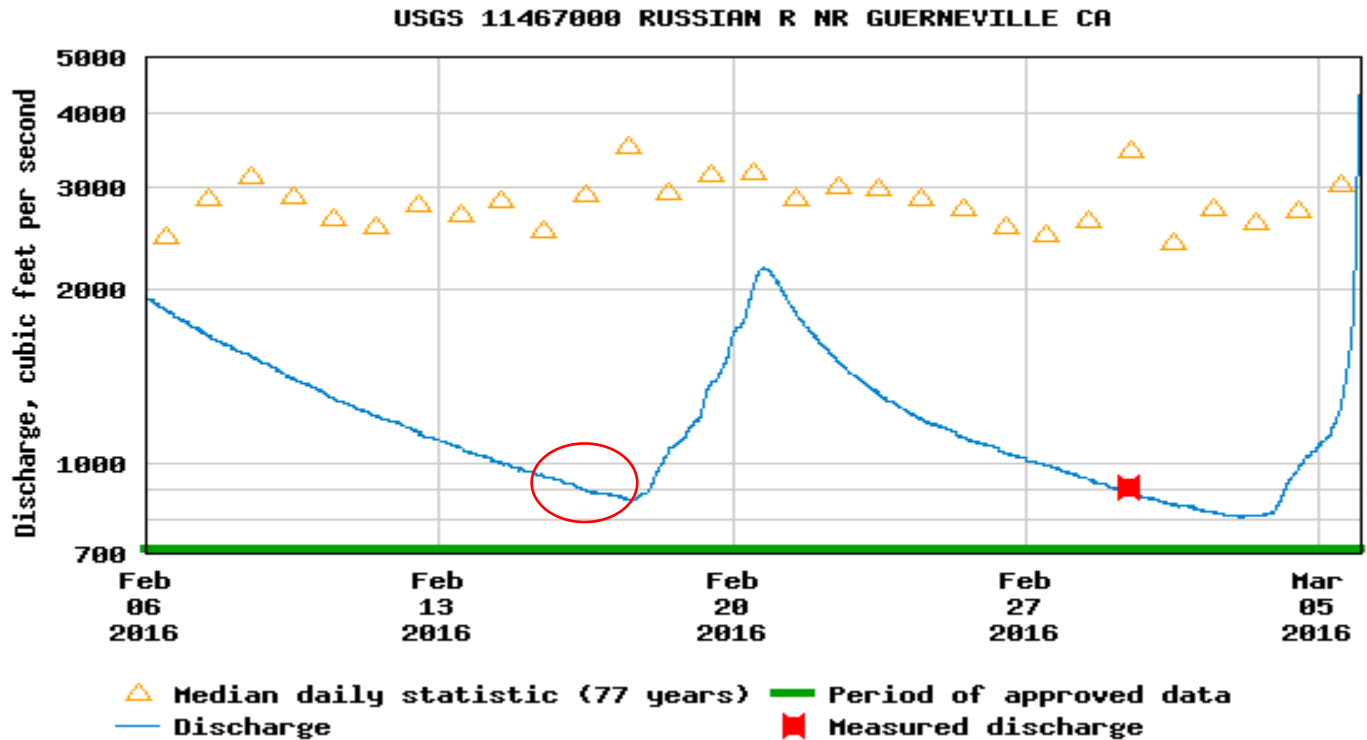


Figure 1. Russian River hydrology at Guerneville (USGS), February 6, 2016 to March 6, 2016. Sport fishing low-flow survey conducted on February 16, 2016 (red circle).

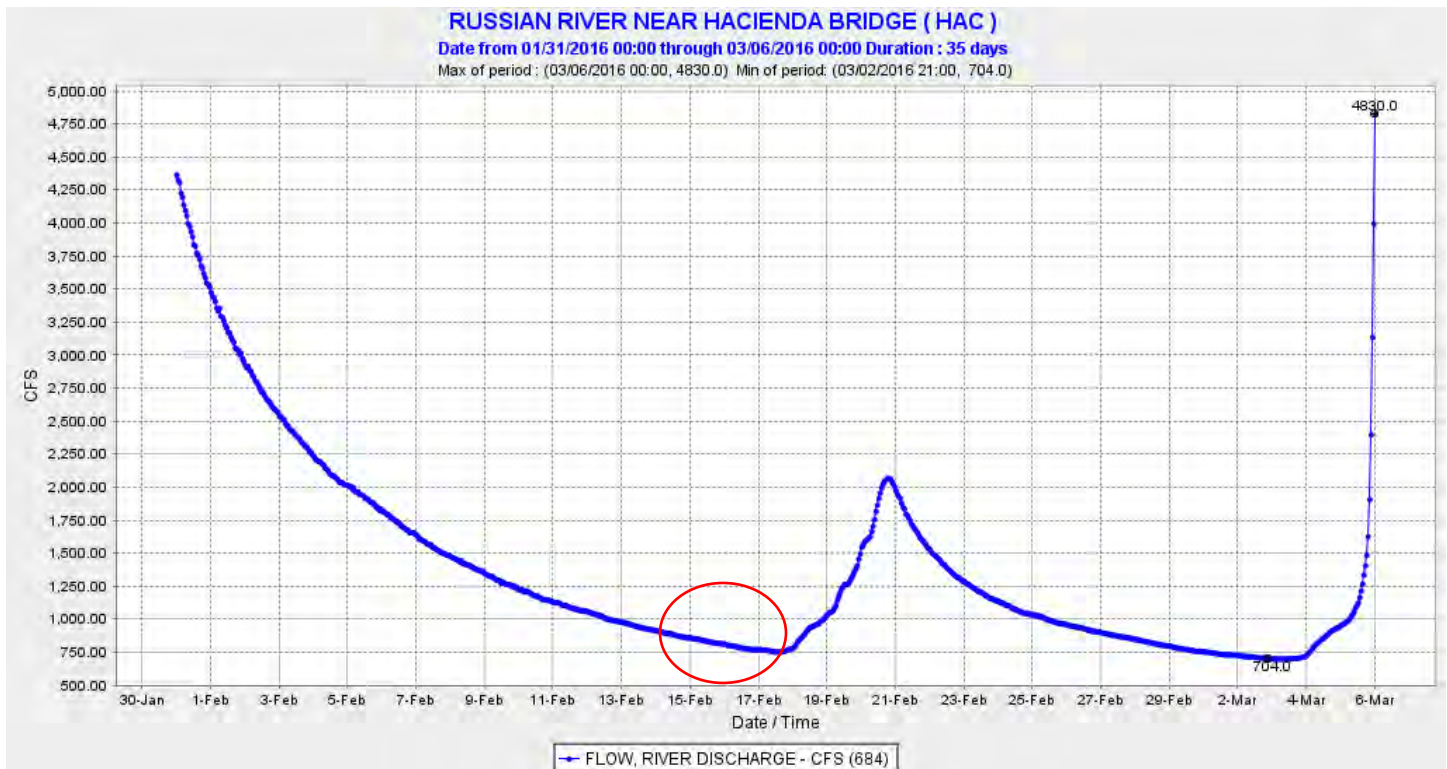


Figure 2. Russian River hydrology at Guerneville (CDEC), January 31, 2016 to March 6, 2016. Sport fishing low-flow survey conducted on February 16, 2016 (red circle).



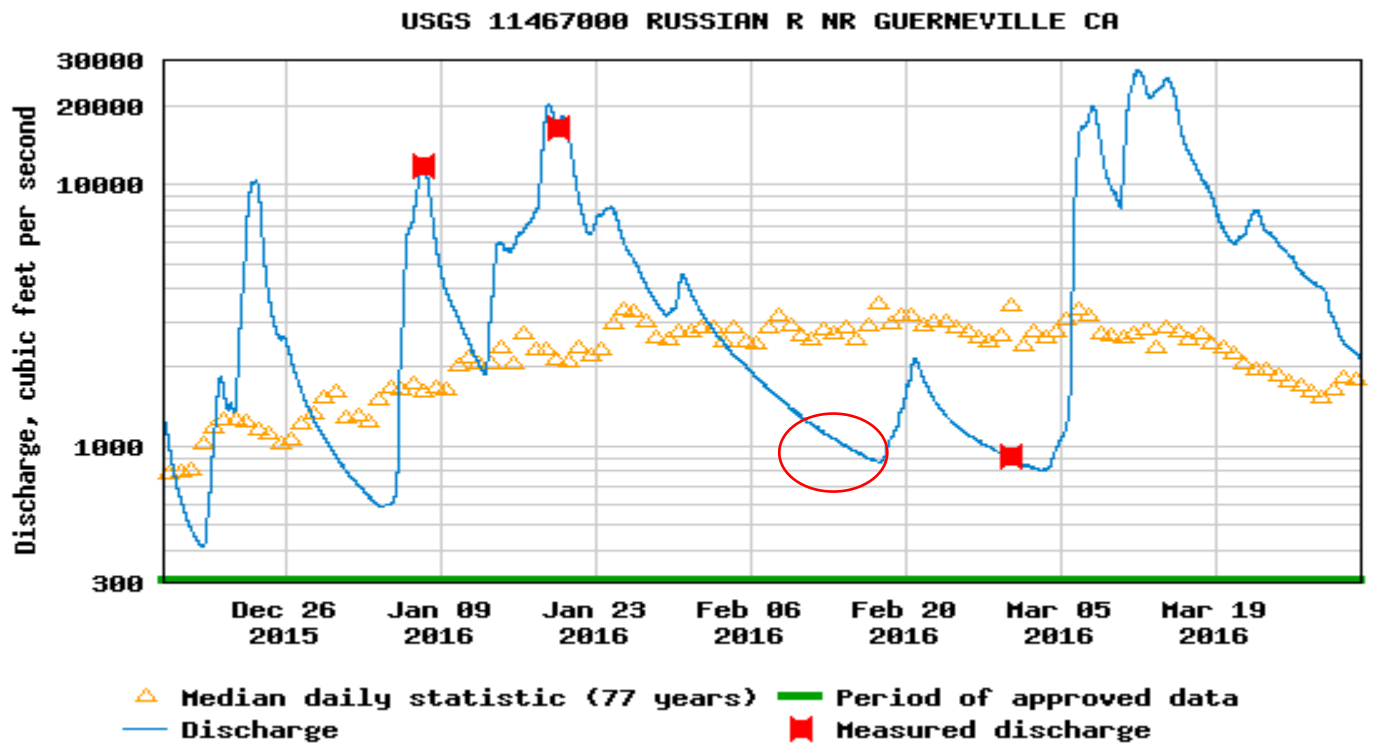


Figure 3. Russian River hydrology at Guerneville (CDEC), January 31, 2016 to March 6, 2016. Sport fishing low-flow survey conducted on February 16, 2016 (red circle).



Photo 1. Steelhead Beach, Russian River, CA. Fishing conditions excellent for conventional gear and fly fishing. Flows at Hacienda approximately 900 cfs (USGS), February 16, 2016.





Photo 2. Steelhead Beach, Russian River, CA. Water color for fishing considered excellent for both conventional and fly fishing. Flows at Hacienda gauge approximately 900 cfs (USGS), February 16, 2016.

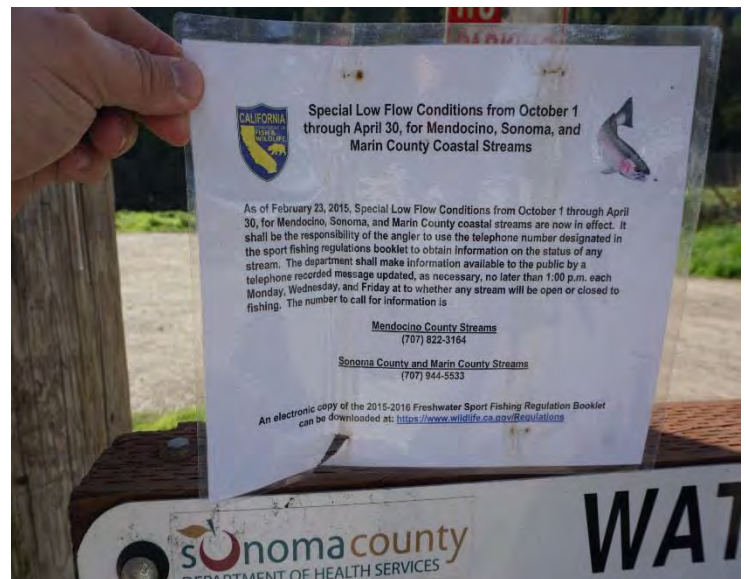


Photo 3. Johnson's Beach, Guerneville (Russian River), CA. Water color for fishing considered excellent for both conventional and fly fishing. Flows at Hacienda gauge approximately 900 cfs (USGS), February 16, 2016.





Figure 4. Johnson's Beach, Guerneville (Russian River), CA. Water color for fishing considered excellent for both conventional and fly fishing. Flows at Hacienda gauge approximately 900 cfs (USGS), February 16, 2016.



Photos 5 & 6. Signage and low-flow condition notice at Johnson's Beach, Guerneville (Russian River), CA. February 16, 2016.





Photo 7. Lower Russian River just above the Monte Rio boat ramp at Monte Rio, CA. Fishing conditions excellent. Approximately 900 cfs (USGS), February 16, 2016.



Photo 8. Dutch Bill Creek, Russian River, CA. February 16, 2016.





Photo 9. Dutch Bill Creek, Russian River, CA. Upstream of Bridge at Monte Rio, February 16, 2016.



Photo 10. Dutch Bill Creek, Russian River, CA. Downstream of Bridge at Monte Rio, February 16, 2016.





Photo 11. Dutch Bill Creek, Russian River, CA. Downstream of Bridge at Monte Rio, February 16, 2016.



Photo 12. Mouth of Dutch Bill Creek at the confluence with the Russian River, CA. February 16, 2016.



## II. Gualala River: Sport fishing low-flow survey 2/16/2016

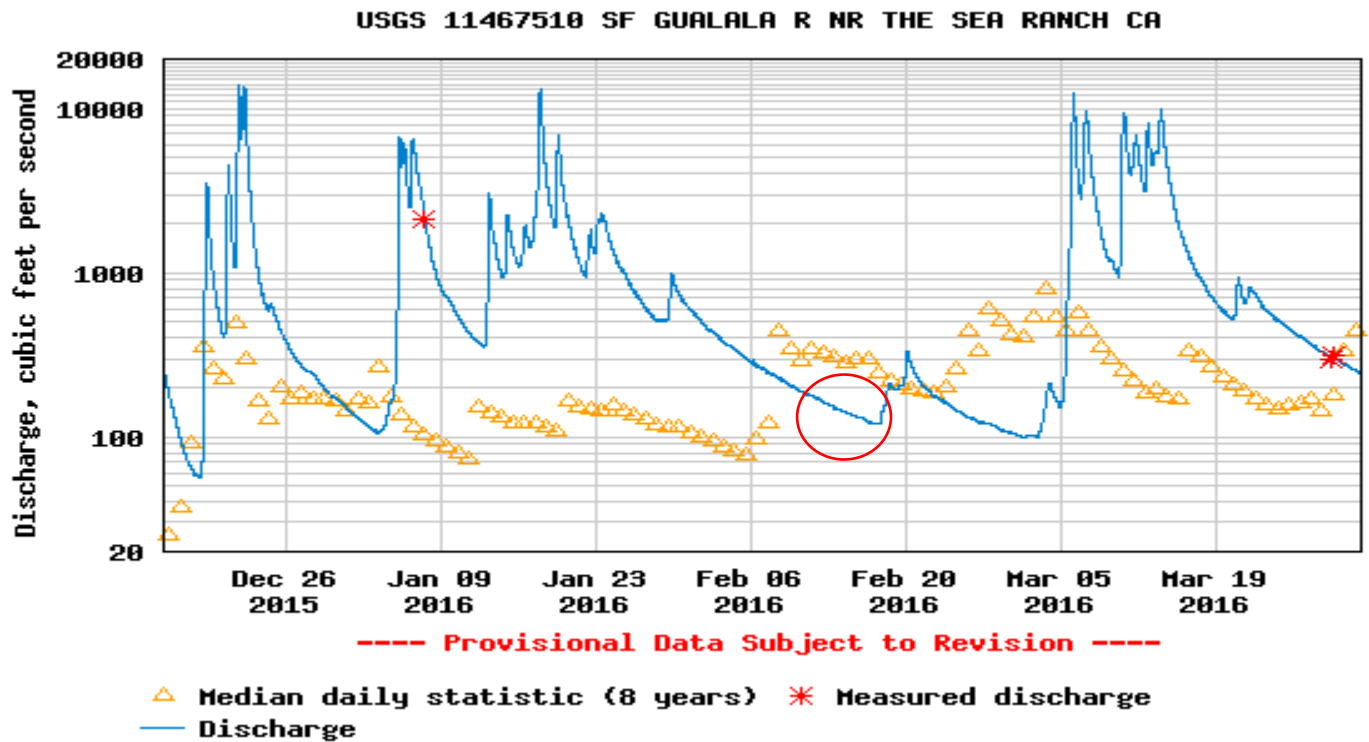


Figure 1. South Fork Gualala hydrology December 15, 2016 through March 31, 2016. Survey conducted February 16, 2016 (red circle). SF Gualala streamflow approximately 125 cfs (USGS), February 16, 2016.

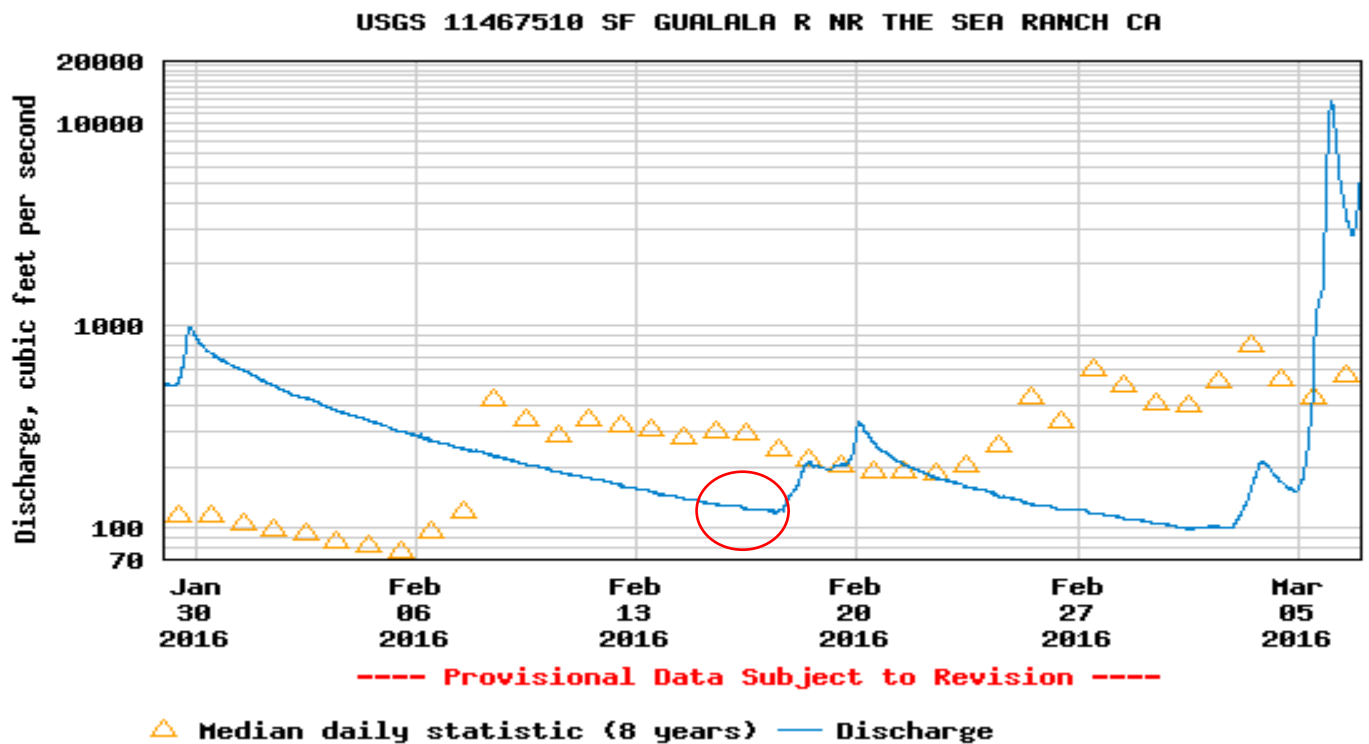


Figure 2. South Fork Gualala hydrology January 29, 2016 through March 6, 2016. Survey conducted February 16, 2016 (red circle). SF Gualala streamflow approximately 125 cfs (USGS), February 16, 2016.

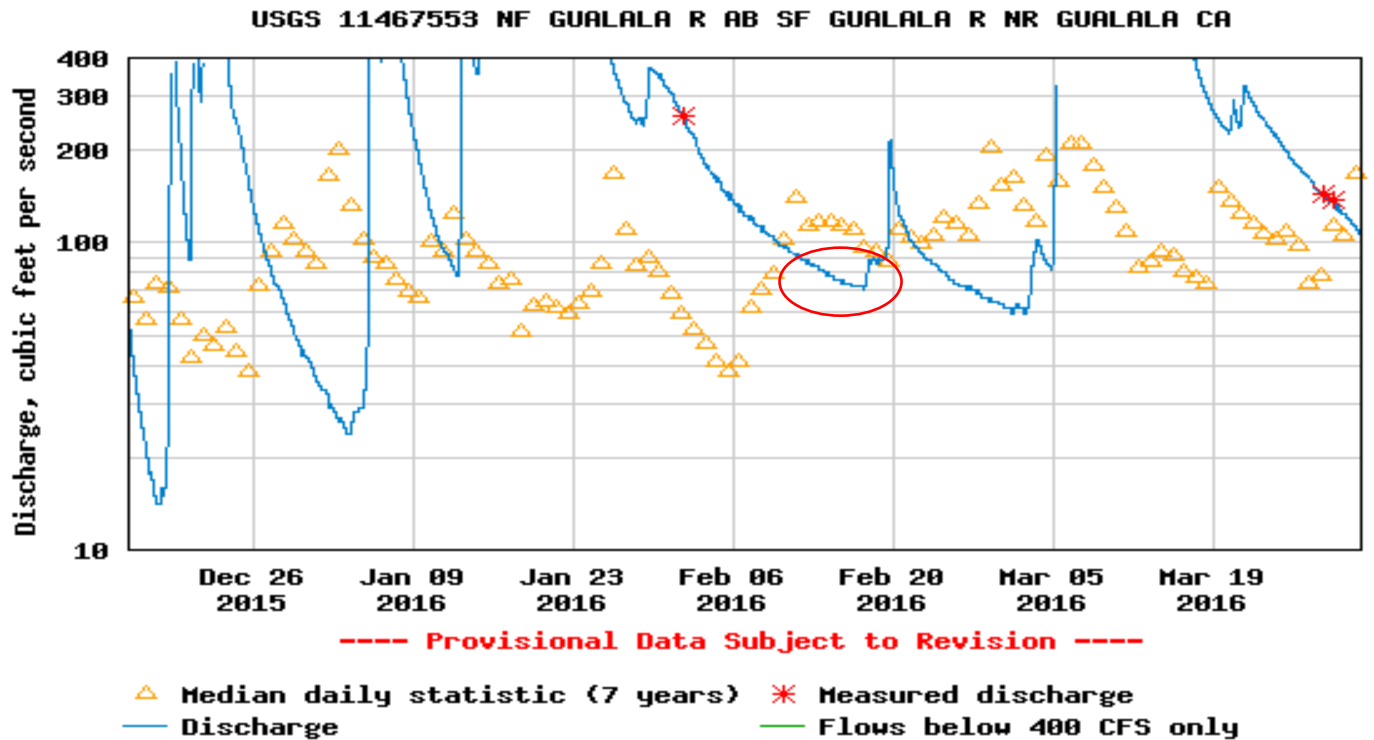


Figure 3. North Fork Gualala hydrology December 15, 2016 through March 31, 2016. Survey conducted February 16, 2016 (red circle). NF Gualala streamflow approximately 72 cfs (USGS), February 16, 2016.



Photo 1. Downstream of the Highway 101 Bridge near Gualala, CA. Water color crystal clear. Fishing conditions considered very low, shallow, and clear. SF Gualala streamflow approximately 125 cfs (USGS) and open to fishing (CDFW), February 16, 2016 (low-flow closure occurred 2/17/2016).





Photo 2. Upstream of the Highway 101 Bridge near Gualala, CA. Water color crystal clear. Fishing conditions considered very low, shallow and clear. SF Gualala streamflow approximately 125 cfs (USGS) and open to fishing (CDFW), February 16, 2016 (low-flow closure occurred 2/17/2016).



Photo 3. Pool at SF/NF confluence, Gualala River, CA. Approximately 72 cfs (USGS) at NF Gualala and 125 cfs (USGS) at SF Gualala, February 16, 2016.



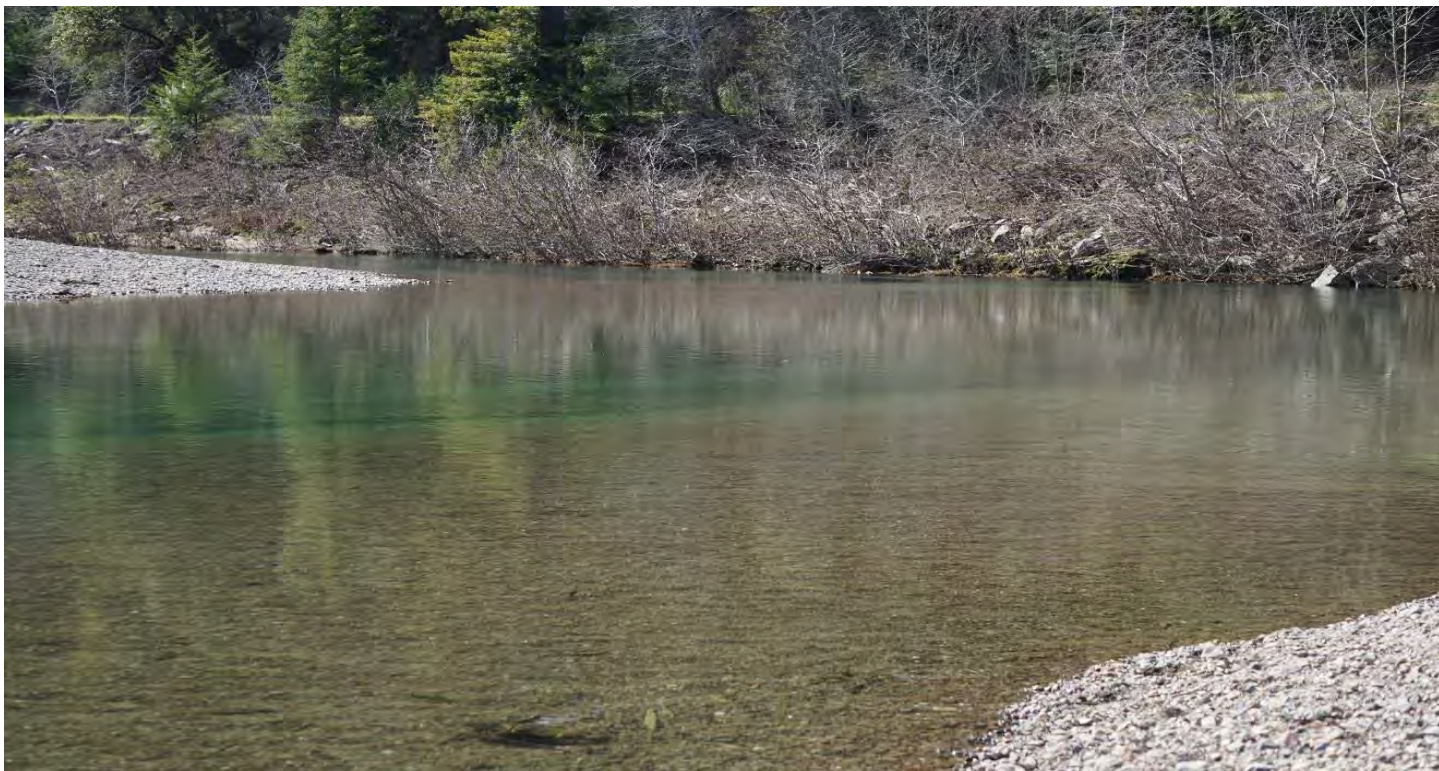


Photo 4. Pool at SF/NF confluence, Gualala River, CA. Approximately 72 cfs (USGS) at NF Gualala and 125 cfs (USGS) at SF Gualala, February 16, 2016.



Photo 5. Discharge from NF Gualala River immediately above confluence with the SF Gualala River. Approximately 72 cfs (USGS) at NF Gualala River, February 16, 2016.





Photo 6. NF Gualala River below NF Gualala Bridge. Approximately 72 cfs at NF Gualala River, February 16, 2016.



Photo 7. NF Gualala River below NF Gualala Bridge. Approximately 72 cfs at NF Gualala River (USGS), February 16, 2016.





Photo 8. NF Gualala River below NF Gualala Bridge. Approximately 72 cfs (USGS) at NF Gualala River, February 16, 2016.



Photo 9. Anglers crossing SF Gualala River immediately above the NF Gualala confluence. When asked about fishing anglers said “too low and clear, probably time to close”. SF Gualala flow approximately 125 cfs, February 16, 2016 (note: fishing still open via CDFW stream status, closed 2/17/2016).





Photo 10. Angler fishing just below NF Gualala confluence, February 16, 2016.



Photo 11. Gualala River just below angler fishing in Figure 24 (above). Riffle shallow and easily wadable, February 16, 2016.





Photo 12. Confluence of SF Gualala and Wheatfield and Twin Bridge (upper extent of fishing limit). February 16, 2016.



Photo 13. Confluence of SF Gualala and Wheatfield and Twin Bridge (upper extent of fishing limit). February 16, 2016.



### III. Garcia River: Sport fishing low-flow survey 2/16/2016

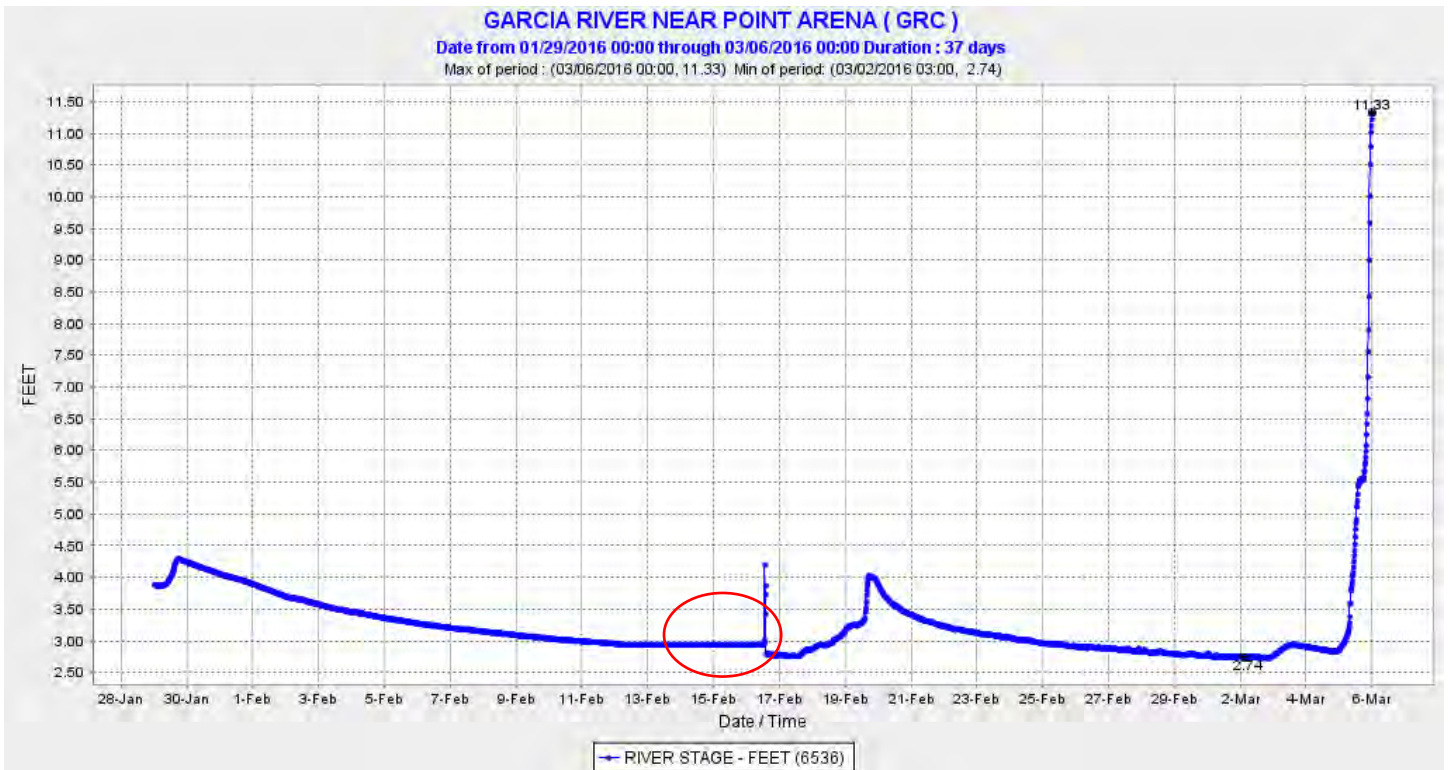


Figure 1. Garcia River stage at Eureka Hill Road Bridge January 29, 2016 through March 6, 2016. Approximately 2.90ft stage height on February 16, 2016 (red circle).



Photo 1. Garcia River directly below Eureka Hill Road Bridge (legal upstream legal fishing limit). Approximately 2.90ft stage height (CDEC) on February 16, 2016.





Photo 2. Garcia River directly upstream Eureka Hill Road Bridge (legal upstream legal fishing limit). Approximately 2.90ft stage height on February 16, 2016.



Photo 3. Signage at boat launch below Eureka Hill Road Bridge. Approximately 2.90ft stage height (USGS) on February 16, 2016.





Photo 4. Signage at boat launch below Eureka Hill Road Bridge. Approximately 2.90ft stage height (CDEC) on February 16, 2016.



Photo 5. Garcia River across from signage at boat launch below Eureka Hill Road Bridge. Approximately 2.90ft stage height on February 16, 2016.





Photo 6. Garcia River shortly downstream of Eureka Hill Road Bridge. Approximately 2.90ft stage height (CDEC) on February 16, 2016.



#### IV. Navarro River: Sport fishing low-flow survey 2/16/2016

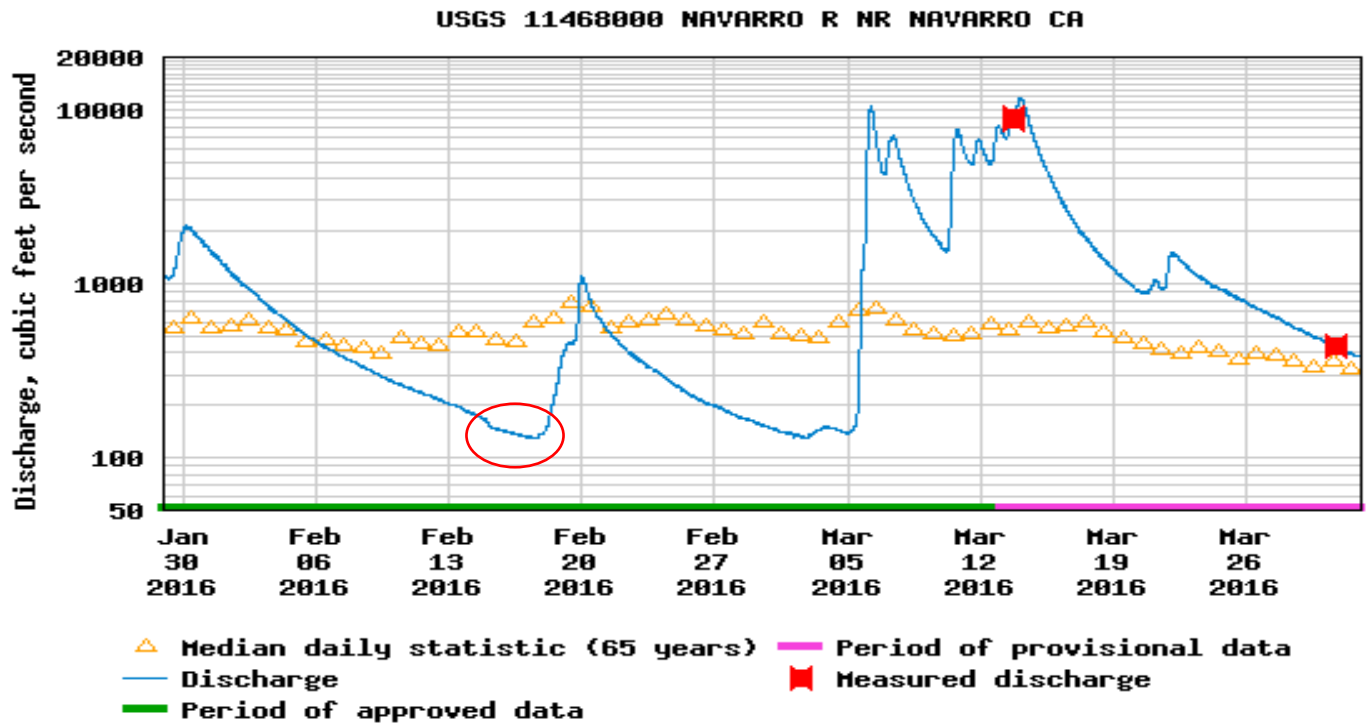


Figure 1. Navarro River hydrology January through March 2016. Navarro River fishing condition survey conducted February 16, 2016 (red circle). Flow approximately 135 cfs (USGS) on February 16, 2016 (fishing closed).

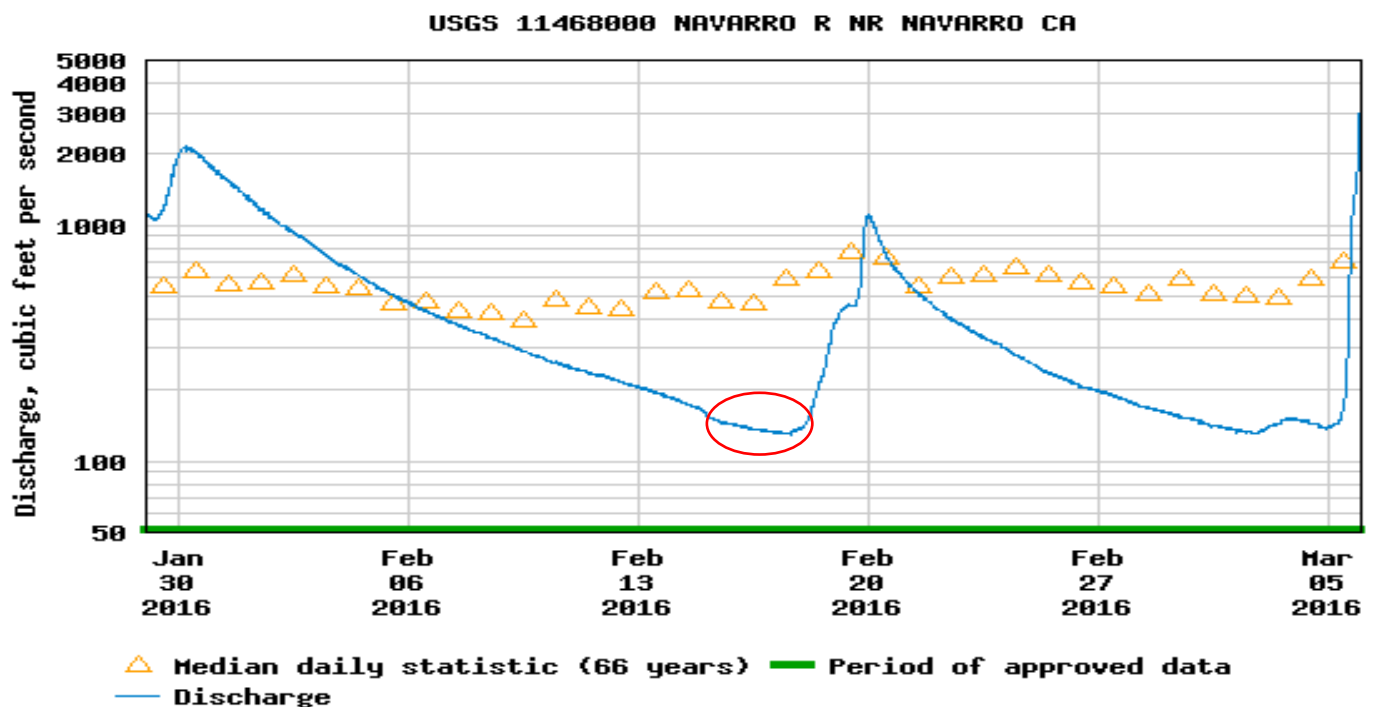


Figure 2. Navarro River hydrology January 30, 2016 through March 6, 2016. Navarro River fishing conditions survey conducted February 16, 2016. Flow approximately 135 cfs (USGS) on February 16, 2016 (fishing closed).



Photo 1. Navarro River mouth (open), February 16, 2016.



Photo 2. Navarro River between Paul Dimmick Campground and the town of Navarro. Flow approximately 135 cfs (USGS) on February 16, 2016 (fishing closed).





Photo 3. Navarro River between Paul Dimmick Campground and the town of Navarro. Flow approximately 135 cfs (USGS) on February 16, 2016 (fishing closed).

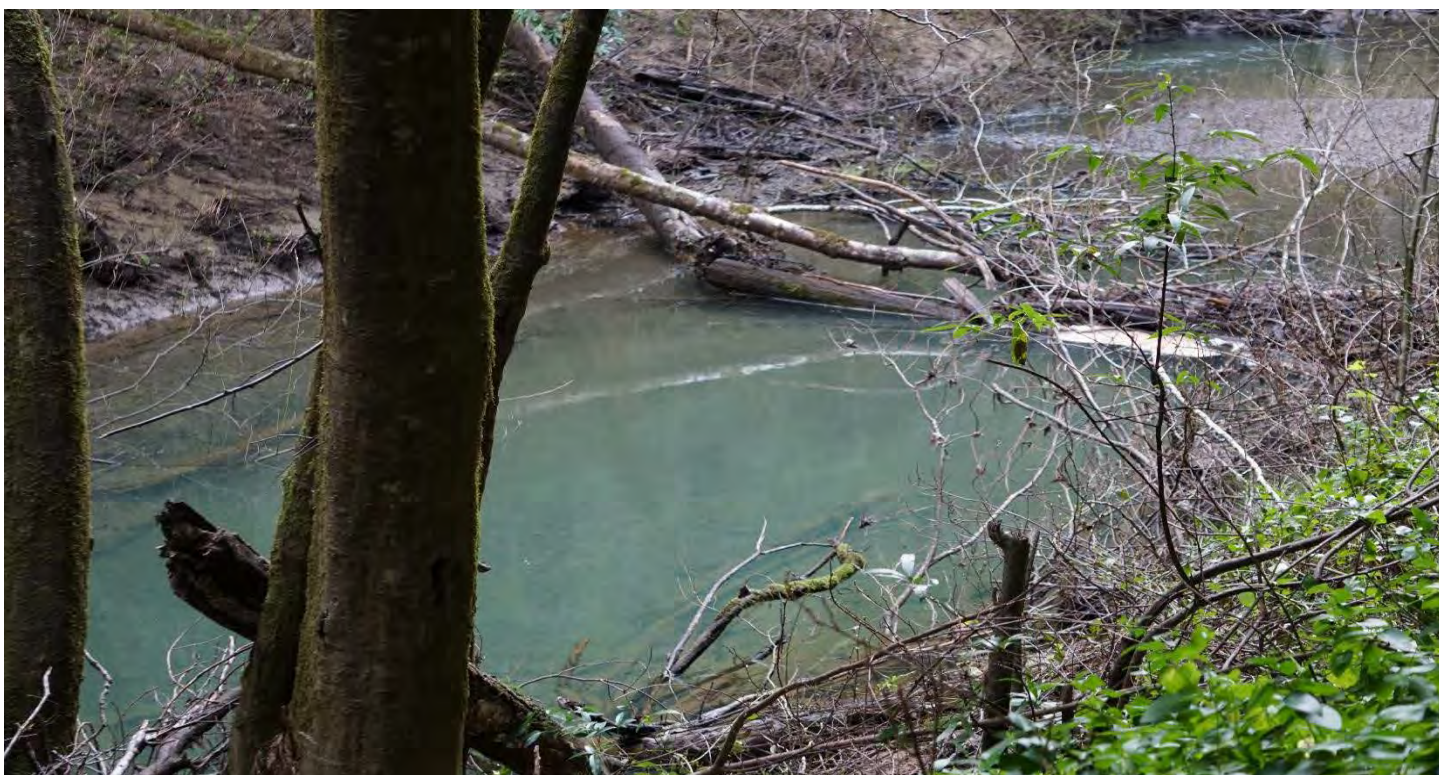


Photo 4. Navarro River between Paul Dimmick Campground and the town of Navarro. Flow approximately 135 cfs (USGS) on February 16, 2016 (fishing closed).





Photo 5. Navarro River between the town of Navarro and Hendy Woods State Park. Flow approximately 135 cfs (USGS) on February 16, 2016 (fishing closed).



Photo 6. Navarro River between the town of Navarro and Hendy Woods State Park. Flow approximately 135 cfs (USGS) on February 16, 2016 (fishing closed).





Photo 7. Looking downstream from Philo – Greenwood Road Bridge (end of legal fishing). Flow approximately 135 cfs (USGS) on February 16, 2016 (fishing closed).



Photo 8. Looking upstream from Philo – Greenwood Road Bridge (end of legal fishing). Flow approximately 135 cfs (USGS) on February 16, 2016 (fishing closed).



State of California  
Department of Fish and Wildlife

## Memorandum

Date: October 13, 2016

To: Kevin Shaffer  
Acting Branch Chief, Inland and Anadromous Fisheries  
California Department of Fish and Wildlife

Valerie Termini  
Executive Director  
California Fish and Game Commission

From: Neil Manji  
Regional Manager, Northern Region  
California Department of Fish and Wildlife

Scott Wilson  
Regional Manager, Bay Delta Region  
California Department of Fish and Wildlife

Subject: Northern Region and Bay Delta Region Response Regarding Fishing Regulation Change (Petition Number 2015-014)

On December 15, 2015, the California Fish and Game Commission (FGC) received a petition for regulation change authored by Patrick Kallerman (petition tracking number 2015-014) recommending changes to freshwater fishing regulations at locations in California Department of Fish and Wildlife (CDFW) Northern (R1) and Bay Delta (R3) regions. R1 and R3 fisheries management staff met to consider the proposed regulation change recommendations and this memo is a coordinated R1 and R3 response to CDFW Fisheries Branch and FGC regarding the petition.

### Petition Summary:

The petitioner recommends change to Title 14, California Code of Regulations:

Chapter 3, Article 3, Section 7.50(b) – Alphabetical List of Waters with Special Fishing Regulations subsections relevant to the following streams (north to south): Usal Creek, Cottaneva Creek, Ten Mile River, Noyo River, Big River, Albion River, Navarro River, Greenwood Creek, Elk Creek, Alder Creek, Brush Creek, Garcia River, Gualala River, Russian Gulch, Salmon Creek, Walker Creek, and Sonoma Creek.

Chapter 3, Article 4, Section 8.00(b) – Low-Flow Restrictions Mendocino, Sonoma, and Marin County coastal streams, subsections relevant to the following streams: Navarro River, Garcia River, and Gualala River.



Proposed amendments to subsections of 7.50(b):

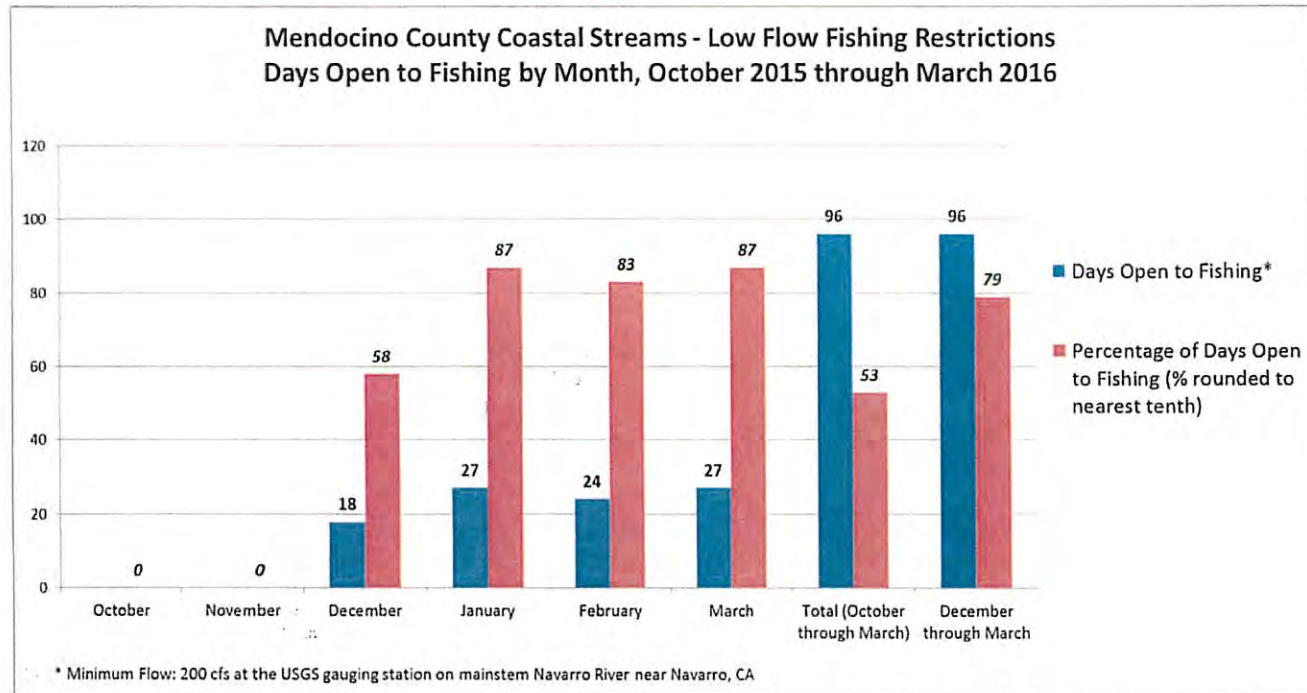
- Amend Section 7.50(b) to permit only artificial lures with barbless hooks to be used year-round; and
- Amend Section 7.50(b) to close streams to all angling from April 1 through October 31.

Proposed amendments to subsections of 8.00(b):

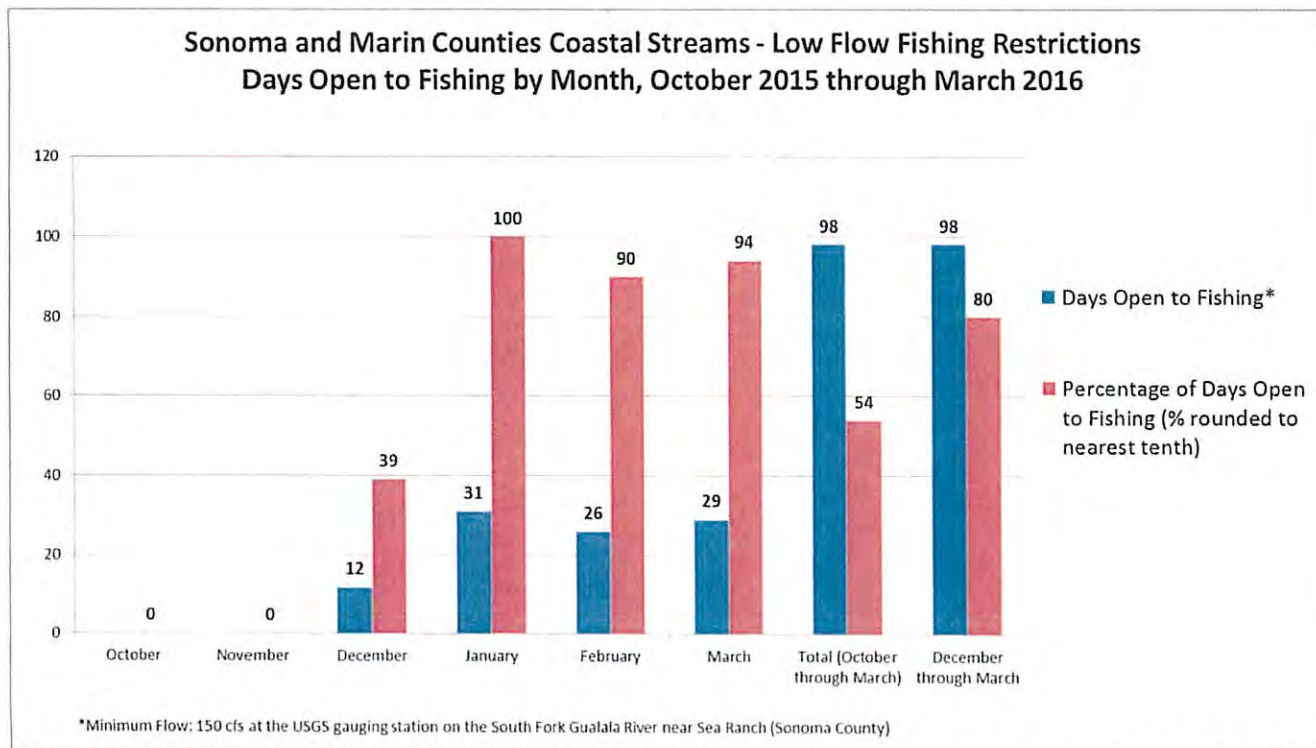
- Amend Section 8.00(b) to leave the Navarro River open to angling on the main stem below the confluence of the North Fork Navarro when the applicable designated gauging station is less than the minimum flows set forth;
- Amend Section 8.00(b) to leave the Garcia River open to angling on the main stem below the Highway 1 Bridge when the applicable designated gauging station is less than the minimum flows set forth; and
- Amend Section 8.00(b) to leave the Gualala River open to angling on the main stem below the confluence of the North Fork Gualala when the applicable designated gauging station is less than the minimum flows set forth.

**Background:** On December 3, 2014, the FGC adopted changes to Chapter 3, Article 3, Section 7.50(b). The petitioner now proposes changes to the same section of the regulations related to low flow angler restrictions, gear type, and seasons in the coastal waters of Mendocino, Sonoma, and Marin counties. The petitions supporting rationale identifies the newly adopted low flow angler closure flows as lacking scientific justification, overly restrictive to artificial lure gear users, and the result is a dramatic loss in fishing opportunity. Data from October 2015 to April 2016 operation of the newly adopted low flow regulation indicates the current regulation appropriately balances the opportunity for steelhead angling under favorable flow conditions with protection for steelhead and closed fishing during periods of low stream flow.

Current regulation controls the opening and closing of creeks and rivers in Mendocino, Sonoma, and Marin counties to angling based upon data from the best available regional USGS flow gauges with Mendocino rivers controlled by the Navarro River gauge and Sonoma/Marin rivers controlled by the South Fork Gualala River gauge. The gauge flow thresholds to open and close angling within the regulation were established based upon local steelhead migration data, migration flow criteria, and the observation and input of CDFW personnel, NOAA personnel, and anglers. During development of the current regulation, and as presented at public meetings, an analysis of the prior ten years of flow gauge data indicated the Navarro gauge threshold would annually have Mendocino rivers open to angling 48% of days during the low flow season and Sonoma/Marin rivers open 51% of days during the low flow season. The current, newly adopted low flow regulation operated for the first year from October 1, 2015, through March 2016, and during this period of time, steelhead fishing was open 53% of days for Mendocino County coastal streams and 54% for Sonoma/Marin rivers and creeks (Figures 1 and 2). However, the majority of steelhead angling in Mendocino, Sonoma, and Marin counties occurs annually from December through March, and accordingly from December 1, 2015, through March 31, 2016, flow controlled rivers were open to fishing 79% and 80%, respectively, of days during the prime fishing season.



**Figure 1.** Number of days open to fishing by month and the corresponding percentage, as well as the overall season (October 2015 through March 2016) in Mendocino County coastal streams (except for the Russian and Gualala rivers).



**Figure 2.** Number of days open to fishing by month and the corresponding percentage, as well as the overall season (October 2015 through March 2016) in Sonoma and Marin Counties coastal streams (except for the Russian River).



The figures also include the number of days open to steelhead angling by month and overall season totals. A total of 96 days of steelhead angling were open on Mendocino County coastal streams, and 98 days, respectively, on Sonoma and Marin rivers from October 2015 through March, 2016. When Mendocino, Sonoma, and Marin fishing was open during the 2015/2016 season, the range of flows and water clarity provided conditions suitable for all types of steelhead angling gear. A survey of fishing conditions conducted while streams were still open, but dropping in flow, found relatively clear water and wading conditions suitable for fly anglers that prefer the lower end of open flows (Photo 1). The fishing opportunity available during the past 2015/2016 season was equivalent to the opportunity estimated during development of the regulation and presented at public meetings.



***Photo 1. The Gualala River when open to fishing under current regulation February 16, 2016, and an example of flow and water clarity conditions suitable for fly anglers provided under current regulations.***

**R1 and R3 Petition Response:** R1 and R3 do not support regulation changes proposed in the petition based upon the following responses.

**Proposed:** Amend Section 7.50(b) to permit only artificial lures with barbless hooks to be used year-round. Proposal would apply to the following creeks and rivers: Usal Creek, Cottaneva Creek, Ten Mile River, Noyo River, Big River, Albion River, Navarro River, Greenwood Creek, Elk Creek, Alder Creek, Brush Creek, Garcia River, Gualala River, Russian Gulch, Salmon Creek, Walker Creek, and Sonoma Creek.

**Response:** Current regulation allows use of bait, artificial lures, and only barbless hooks from November 1 to March 31, in the subject waters. Bait fishing for steelhead can be effective during river conditions that are higher flow and cloudier water than conditions that are effective for artificial lures, and bait fishing is a gear type frequently used for steelhead angling. Amending the regulation for the removal of bait gear would significantly reduce a popular angling opportunity. R1 and R3 do not support this section of the regulation change proposal.

**Proposed:** Amend Section 7.50(b) to close streams to all angling from April 1 through October 31. Proposal would apply to the following creeks and rivers: Usal Creek, Cottaneva Creek, Ten Mile River, Noyo River, Big River, Albion River, Navarro River, Greenwood Creek, Elk Creek, Alder Creek, Brush Creek, Garcia River, Gualala River, Russian Gulch, Salmon Creek, Walker Creek, and Sonoma Creek.

**Response:** Fishing is currently closed from April 1 to the day before the fourth Saturday in May in the subject waters for the protection of post spawn adult steelhead that are migrating downstream to the ocean and for downstream migrating salmonid juveniles. From the fourth Saturday in May to October 31 these waters are open to catch and release of resident trout and fishing for non-native fish species present in some streams. Anecdotal CDFW observation of fishing pressure that occurs from the fourth Saturday in May to October 31 indicates very little fishing and impact to native fish occurs during this time period. Amending the regulation to close fishing from April 1 through October 31 does not provide significant additional protection to an impacted fisheries resource and reduces fishing opportunity. R1 and R3 do not support this section of the regulation change proposal.

**Proposed:** Amend Section 8.00(b) to leave the Navarro River open to angling on the main stem below the confluence of the North Fork Navarro when the applicable designated gauging station is less than the minimum flows set forth. Amend Section 8.00(b) to leave the Garcia River open to angling on the main stem below the Highway 1 Bridge when the applicable designated gauging station is less than the minimum flows set forth. Amend Section 8.00(b) to leave the Gualala River open to angling on the main stem below the confluence of the North Fork Gualala when the applicable designated gauging station is less than the minimum flows set forth.

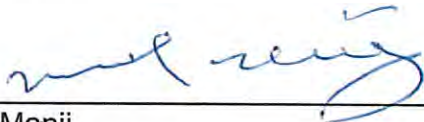
**Response:** The amendments propose to open to angling in the lower portion of the subject rivers during low flow conditions. Steelhead will be concentrated in shallow clear water, easily visible to anglers, less able to move, and more prone to repeat hooking. The current low flow regulation opens the subject area of these rivers when flows are above a flow gauge threshold and under conditions suitable for a lower impact catch and release fishery. A good fishing



opportunity that also provides protection to steelhead is being provided in the subject area of these rivers under current regulation. The proposed change would add complexity to regulations by dividing open sections of the subject rivers into two sections with different regulations. CDFW seeks to reduce complexity in fishing regulation. R1 and R3 do not support this section of the regulation change proposal.

Please contact Allan Renger at 707-725-7194, [allan.renger@wildlife.ca.gov](mailto:allan.renger@wildlife.ca.gov), or George Neillands at 707-576-2812, [george.neillands@wildlife.ca.gov](mailto:george.neillands@wildlife.ca.gov), if you have further questions or concerns.

Sincerely,



Neil Manji  
Regional Manager, Northern Region (R1)



Scott Wilson  
Regional Manager, Bay Delta Region (R3)

cc: Tony LaBanca, Eric Larson, Allan Renger, George Neillands, Ryan Watanabe, Scott Monday, Scott Harris  
Department of Fish and Wildlife  
[tony.labanca@wildlife.ca.gov](mailto:tony.labanca@wildlife.ca.gov), [eric.larson@wildlife.ca.gov](mailto:eric.larson@wildlife.ca.gov), [allan.renger@wildlife.ca.gov](mailto:allan.renger@wildlife.ca.gov),  
[george.neillands@wildlife.ca.gov](mailto:george.neillands@wildlife.ca.gov), [ryan.watanabe@wildlife.ca.gov](mailto:ryan.watanabe@wildlife.ca.gov),  
[scott.Monday@wildlife.ca.gov](mailto:scott.Monday@wildlife.ca.gov), [scott.harris@wildlife.ca.gov](mailto:scott.harris@wildlife.ca.gov)



Tracking Number: 2015-015

To request a change to regulations under the authority of the California Fish and Game Commission (Commission), you are required to submit this completed form to: California Fish and Game Commission, 1416 Ninth Street, Suite 1320, Sacramento, CA 95814 or via email to [FGC@fgc.ca.gov](mailto:FGC@fgc.ca.gov). Note: This form is not intended for listing petitions for threatened or endangered species (see Section 670.1 of Title 14).

Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or [FGC@fgc.ca.gov](mailto:FGC@fgc.ca.gov).

### SECTION I: Required Information.

*Please be succinct. Responses for Section I should not exceed five pages*

**1. Person or organization requesting the change (Required)**

Name of primary contact person: Fred Boniello

Address: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Email address: \_\_\_\_\_

**2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested:** Section 200, 202, 205, 215, 220, 240, 315, 316.5 of Fish & Game Code.

**3. Overview (Required) - Summarize the proposed changes to regulations:** 7.50b 155A Title 14 8.00b3 Title 14 North Coast Central District, Russian River to be open to sport fishing all year with a no minimum flow requirement. A no take "Catch and Release" of all migratory species including hatchery fish (if the C.D.F.W. would like). A year round restriction for the use of bait (artificial only permitted). The year round closure from the point of the C.D.F.W.'s Coho reestablishment monitoring project (near the confluence of Austin Creek) to the Pacific Ocean, as not to interfere with their efforts. All proposed changes to include current hook requirements, such as barbless and single.

**4. Rationale (Required) - Describe the problem and the reason for the proposed change:** 8.00b3 Myself and other sport fishing anglers are not allowed to sport fish for any species from Oct. 1 to April 30th unless the river flow is at 3000 C.F.S or more, leaving us with no sport fishing for long periods on what we feel are our home waters (many of us being native to the area). With the vast majority of migrating species being hatchery fish coupled with changes proposed above (overview) and also the rights of others being able to use and enjoy the Russian River year round (kayaks, canoes, swimmers, dogs, special events, etc) adding all due respect to them, we feel somewhat left out of things we are interested in doing year round. It is important that the C.D.F.W. realize many of us have other interests (family, work, hobbies, to mention a few) and that many of us would not be able to sport fish at the same times. Adding (that with all due respect) the C.D.F.W. should not make that assumption.





**SECTION II: Optional Information**

5. **Date of Petition:** Dec. 16, 2015
6. **Category of Proposed Change**  
☒ Sport Fishing  
☐ Commercial Fishing  
☐ Hunting  
☐ Other, please specify: \_\_\_\_\_
7. **The proposal is to:** *(To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)*  
☒ Amend Title 14 Section(s): 7.50, 8.00  
☐ Add New Title 14 Section(s): \_\_\_\_\_  
☐ Repeal Title 14 Section(s): \_\_\_\_\_
8. **If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition** \_\_\_\_\_  
Or ☒ Not applicable.
9. **Effective date:** If applicable, identify the desired effective date of the regulation.  
If the proposed change requires immediate implementation, explain the nature of the emergency: March 1, 2017, preferably earlier if possible. Perhaps through some sort of Public Notice (Local newspaper the Press Democrat) and/or revised issue of Regulations between current effective dates.
10. **Supporting documentation:** Identify and attach to the petition any information supporting the proposal including data, reports and other documents: Knowledge of the area (having lived in Santa Rosa, Ca. for over 50 years and sport fished the Russian River for over 35 years) respectively, in addition to signed proposal enclosed. Also see attached closing statement for regulation changes.
11. **Economic or Fiscal Impacts:** Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: May have had and/or continue to have negative revenue impact on the above due to less travel and spending of visiting and local sport anglers during low flow closure period (listed in current regulations). Our proposal could only help to provide a more positive revenue impact listed in number 11 (economic or fiscal impacts:)
12. **Forms:** If applicable, list any forms to be created, amended or repealed: \_\_\_\_\_



**SECTION 3: FGC Staff Only**

Date received: 12/16/15

FGC staff action:

- ☒ Accept - complete
- ☐ Reject - incomplete
- ☐ Reject - outside scope of FGC authority

Date petitioner was notified of receipt of petition and pending action: 12/18/15

Meeting date for FGC consideration: February 10-11, 2016

FGC action:

- ☐ Denied by FGC
- ☐ Denied - same as petition: \_\_\_\_\_  
Tracking Number
- ☐ Granted for consideration of regulation change

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## Memorandum

Date: September 6, 2018

To: Stafford Lehr, Deputy Director  
Wildlife Fisheries Division

From: Kevin Shaffer, Chief  
Fisheries Branch



Subject: **Fish and Game Commission Regulation Change Petition No. 2015-015**

### Overview

On December 16, 2015, the Fish and Game Commission (Commission) received a Regulation Change Petition (Tracking Number 2015-015) concerning sport fishing regulations on the Russian River (California Code of Regulations, Title 14, sections 7.50(b) and 8.00(b)). The Commission forwarded the petition to the Department of Fish and Wildlife (Department) for review and requested the Department to meet with the petitioner to discuss their requests and concerns. The proposed changes outlined in petition include the following:

- 1) Open the Russian River to sport fishing all year with no minimum flow requirement;
- 2) A no-take "Catch and Release" of all migratory species including hatchery fish;
- 3) Year-round closure from the point of the Coho Salmon reestablishment monitoring project (near the confluence of Austin Creek) downstream to the Pacific Ocean; and
- 4) Year-round restriction on the use of bait and all proposed changes to include hook requirements, such as barbless and single hook.

Fisheries management staff met with the petitioner on two separate occasions to discuss their proposed regulation changes. For the reasons stated herein, the Department does not support the proposed regulation changes in this petition, and recommends that the Commission deny this petition. Attached are formal responses to this petition from the Department, memo dated April 24, 2018, and from the National Marine Fisheries Service (NMFS), letter dated April 4, 2018. Please refer to the attached documents for additional information including figures, data, photos, etc. supporting the Department's recommendation to deny this petition.

### Background

In 2014, the Department proposed regulatory changes to Title 14, Chapter 3, Article 4, Section 8.00, subsection (b) to add low-flow fishing restrictions to the Russian River and base the closure of North Central-Coast streams on one or more stream gauges on rivers that are more representative of these North Central-Coast streams than the current regulated flows of the Russian River.

The proposed regulatory changes were the result of a collaborative effort among NMFS, the Department, local stakeholders and watershed councils, to address fishery impact concerns that had arisen during the prior three years of drought, with the goal of protecting ESA-listed fish while still providing sport fishing opportunities.

Prior to 2015, a low flow closure regulation on the Russian River had not been promulgated. The Russian River is a regulated stream with flows under the control by two dams. Due to water diverted to Lake Mendocino through the Potter Valley Project, stream flows in the Russian River had been artificially high, year round. In the mid-2000s, a regulatory/recovery program was implemented under a Federal Biological Opinion to reduce flows in the river. At which time, the Department began to see fall pre-rain flows near 150 cfs, rather than 400 cfs. It was at that point a low flow regulation need became apparent.

On December 3, 2014, following two stakeholder meetings and three public Commission meetings, the Commission adopted the Department's proposed regulatory changes to the low flow closure regulations on the North Central-Coast streams. Specifically, the Commission voted to change the location where streamflow is measured to trigger low-flow closures on 17 streams in Mendocino, Sonoma, and Marin counties from the Russian River to the Gualala and Navarro rivers, and established minimum flow requirements of 150 cfs and 200 cfs, respectively. In addition, the Commission adopted a low-flow closure for the Russian River in Sonoma County with a minimum flow requirement of 300 cfs at the gauging station located on the main stem Russian River near Guerneville.

Approximately nine months after the regulations went into effect, the Commission received a petition (Tracking Number 2015-015) to amend the newly adopted low flow closure regulations on the Russian River. The Commission forwarded the Petition to the Department for review and directed the Department to meet with the petitioner to discuss the petitioner's concerns and requests.

#### Coordination with Petitioner

- Meeting in Santa Rosa on November 8, 2017 – Department staff from Region 1, Region 3, and Fisheries Branch met with the petitioner to answer questions and discuss their concerns. The purpose of this meeting was not for the Department to give definitive answers to the petitioner's regulation change requests but rather to have open dialogue.
- Wildlife Resources Committee (WRC) Meeting on January 18, 2018 – The Department presented its recommendation to the WRC that it not move forward with the proposed regulation changes in Regulation Change Petition Tracking Number 2015-015. After hearing comments from the public, the WRC did not make a ruling on the petition and asked the Department to meet with the stakeholders again.

- Meeting in Santa Rosa on May 2, 2018 – Department held a second meeting with the petitioner to discuss their proposed regulation changes and answer questions. In attendance were six Department staff, three NMFS staff, and the petitioner. The Department asked NMFS to attend the meeting because the agency had been involved in the development of the low flow regulations in 2014, including providing its own proposal for low flow fishing restrictions on the Russian River.

#### Responses to Proposed Regulation Changes

- 1) The Department does not support the removal of the minimum flow level for the Russian River. It would remove protections for listed salmonids from recreational fisheries during stream conditions that are adverse for the fish. The use of low-flow closures is a well-established fishery management tool used on other coastal streams in California. Reversing the implementation of low-flow closure regulations would undo recovery actions listed in NMFS species recovery plans. Title 14 Section 8.00(b)(3) established a low-flow closure season from October 1-April 30, and would only affect fishing under low-flow conditions during that period. (Note: In December 2017, the Commission voted to amend Section 8.00(b)(3) and shorten the low flow season by one month, which now ends on March 31).

Sport fishing outside this period would be unaffected by this regulation. The Department recognizes that some fishing opportunity may be lost during the low-flow season, but due to the low population levels of Chinook Salmon and Coho Salmon in the Russian River these protections are necessary measures to maintain a steelhead fishery with reduced impacts to other listed salmonids. In respect to the steelhead fishery, the Department believes ample fishing opportunity was achieved and lost opportunity occurred mainly in the early season before the peak in the steelhead run.

- 2) The Department does not support the petitioner's request to allow targeted catch and release fisheries for CC Chinook Salmon and CCC Coho Salmon. Allowing such fisheries to occur would counteract objectives and recovery actions identified in State's Coho Salmon Recovery Strategy and NMFS recovery plans for both species. The Department supports the take of hatchery steelhead in the Russian River to reduce potential impacts to wild steelhead within the watershed.
- 3) The Department does not support a year-round fishing closure from the point of the Coho Salmon reestablishment monitoring project (near the confluence of Austin Creek) downstream to the Pacific Ocean. The Russian River Coho Salmon Captive Broodstock Program is a collaborative conservation hatchery partnership including the US Army Corps of Engineers, NMFS, CDFW, Sonoma County Water Agency, and the University of California Cooperative Extension/California Sea Grant Extension Program, to recover Coho Salmon within the watershed. Lower Russian River Priority Areas for Coho Salmon are identified in (Figure 7 in the attached memo) which encompasses an area much larger than the proposed closed area.



The Department cannot evaluate a year-round closure of the area from the confluence of Austin Creek downstream to the Pacific Ocean when an objective and rationale has not been provided. The low-flow management tool offers better protection to listed species than a spatial closure because the adverse conditions are temporal (hydrologically driven) rather than spatial. Closures are temporary as needed, and as conditions improve, fishing opportunity returns. Spatial closures close fishing opportunity and shift effort to other areas and do not provide the needed protection for migratory species.

- 4) At this time the Department does not support a year-round restriction on the use of bait. Current regulation allows the use of bait and barbless hooks only from November 1 to March 31, and only artificial lures with barbless hooks may be used from April 1 through October 31 in the subject waters. Bait fishing for steelhead is a frequently used angling method and can be effective during river conditions when there are higher flow and cloudier water. Artificial lures are more effective during lower river flow and clearer water conditions. Amending the regulation for the removal of bait gear would significantly reduce a popular angling opportunity. The Department does not support this section of the regulation change proposal at this time. Future discussion of gear restrictions will be addressed in the development of new anadromous regulations.

### Conclusion

The Department does not support Regulation Change Petition (Tracking No. 2015-015). The proposed regulation changes conflict with state and federal fisheries management objectives and would undo recovery actions listed in NMFS species recovery plans. The Department and NMFS believe that the current low flow restrictions are working to improve the protection for ESA-listed salmonids during their upstream migrations to subsequent spawning destinations, and provide adequate fishing opportunity. The Department will continue to monitor flows on the Russian River and evaluate the effectiveness of the low flow closures. In addition, the Department will address gear restriction changes on all coastal streams during development of pending statewide anadromous regulations. The Department strives to keep the Russian River, and all state waters, open to fishing as much as possible, for all angling types.





**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
West Coast Region  
777 Sonoma Avenue, Room 325  
Santa Rosa, California 95404-4731

April 4, 2018

Jonathan Nelson  
Anadromous Conservation and Management Program  
Fisheries Branch  
California Department of Fish and Wildlife  
830 S Street  
Sacramento, California 95811

Dear Mr. Nelson:

This letter is in regard to the Petition (Petition) for regulation change authored by Mr. Fred Boniello (petition tracking number 2015-15) to the California Fish and Game Commission (CFGC) recommending changes to freshwater fishing regulations on the Russian River in Title 14, Chapter 3, Article 3 subsections 7.50(b) and 8.00(b). We understand Mr. Boniello requests the following changes:

- 1) Open the Russian River to sport fishing all year with no minimum flow requirement.
- 2) A no-take "Catch and Release" of all migratory species including hatchery fish.
- 3) Year round closure from the confluence of Austin Creek downstream to the Pacific Ocean.
- 4) All proposed changes to include hook requirements, such as barbless and single hook.

In 2013, NOAA's National Marine Fisheries Service's (NMFS), in close coordination with CDFW Region 3 (R3), authored a proposed low-flow closure regulation change for the Russian River for the primary purpose to enhance the protection of federally Endangered Species Act (ESA) listed adult salmonids during prolonged low-flow periods (Enclosure 1). Subsequently, CDFW R3 and CFGC supported a low-flow closure threshold for the Russian River, which was implemented in 2015. Currently, the Russian River main stem below the confluence of the East Branch Russian River is open to fishing all year under Title 14 section 7.50(b)(155)(A). Title 14 section 8.00(b)(3) identifies a low-flow closure season from October 1 - April 30 which restricts fishing opportunity when flows recede below 300 cfs at the USGS Guerneville gauging station (1146700) during the low-flow closure season. This new and current Russian River fishing regulation, which is the subject of the current Petition, is in alignment with NMFS' mission to protect and recover salmonids listed under the federal ESA of 1973, as amended.

Salmonids in many coastal watersheds in California are subject to increased angling pressure during periods of extended or prolonged low-flow conditions. CDFW currently has low-flow closures in most watersheds in Marin, Sonoma, and Mendocino counties, with established low-flow thresholds to protect adult salmonids during their spawning migration. When low-flow



conditions occur, adult salmonids are subjected to increased mortality potential due to physiological stress, decreased passage or migration opportunity and quiescence, predation, and elevated angling pressure. Due to the elevated risk associated with these low-flow conditions, we believe it is prudent to retain their current protection during these vulnerable periods, and do not support removing the current low-flow restriction (Petition change #1).

To date, these enhanced protections during the fishing season have resulted in river closure during low flow periods in the fall prior to onset of winter rains, coinciding with federally ESA-listed threatened California Coastal (CC) Chinook salmon and federally and state listed endangered Central California Coast (CCC) coho salmon migration periods. NMFS does not support Petition change #2 as proposed, which would result in 'catch and release' fisheries targeting CC Chinook salmon and CCC coho salmon, and would conflict with the fishery management objectives to harvest hatchery steelhead in the Russian River. Regarding Petition change #3, NMFS would like to discuss and evaluate this proposed change further with CDFW staff during the development of the hatchery management plan for the Russian River steelhead program currently in progress. Finally, we understand that gear restrictions changes (Petition change #4) will be addressed in the development of pending statewide anadromous regulations.

In summary, NMFS believes federally ESA-listed salmonids inhabiting the Russian River should receive the necessary protection from anglers during critically low-flow periods to ensure species recruitment and conservation goals. Following river flow increases, the fishing season has remained open for the remainder of the water-year, coinciding with the migration of CCC steelhead, and allowing ample fishing opportunity through the winter and spring since implementation of the emergency closures and current regulations (Enclosure 2). NMFS supports an appropriate low-flow closure threshold for the Russian River and the current protections which the regulations in subsections 7.50(b) and 8.00(b) provide.

If you have any questions or would like additional information regarding our support for this effort, please contact Joshua Fuller at (707) 575-6096 or by email at [Joshua.Fuller@noaa.gov](mailto:Joshua.Fuller@noaa.gov).

Sincerely,



Alecia Van Atta  
Assistant Regional Administrator  
California Coastal Area Office

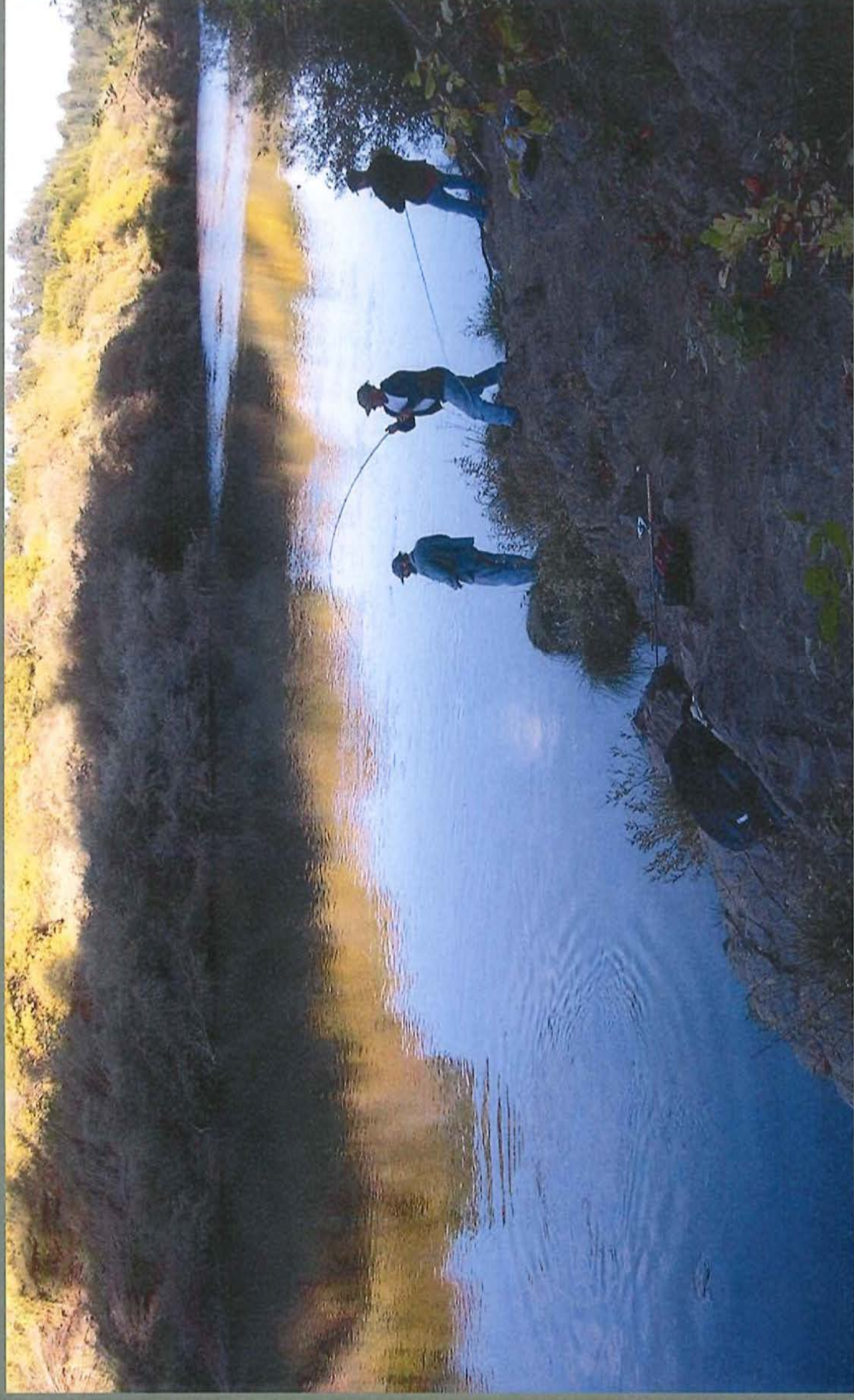
#### Enclosures

cc: Charlton Bonham, Director, CDFW, Sacramento, CA  
Stafford Lehr, Fisheries Branch Chief, CDFW, Sacramento, CA  
Scott Wilson, Regional Manager, CDFW, Yountville, CA  
Eric Larson, Biological Programs Manager, CDFW, Yountville, CA  
Neil Manji, Regional Manager, CDFW, Redding, CA  
Tony LaBanca, Coastal Fisheries Environmental Program Manager, CDFW, Eureka, CA  
Allan Renger, Southern Humboldt and Mendocino counties Fisheries Management  
Acting Supervisor, CDFW, Fortuna, CA



# Russian River

## Approach to the Proposed Fishing Regulation Change



Chinook hook-up, Russian River, CA – 16 October 2006



## Current Russian River Fishing Regulations:

1. Russian River main stem below the confluence of the East Branch Russian River = **Open all year**
2. Russian River main stem above the confluence of the East Branch and all Russian River tributaries = **Closed**
3. Russian River within 250 feet of the Healdsburg Memorial Dam = **Closed**
4. North Central District – Central Coast Streams
  - Chapter 3. Article 4. Supplemental Regulations. 8.00. Low-Flow Restrictions. (b) Central Coast Streams – Stream Closures: Special Low Flow Conditions. **From October 1 through April 1**, any of the stream reaches listed in subsection (1) and (2)... (1) The Sonoma Creek (Sonoma County), and all streams tributary to the Pacific Ocean (and its bays) in Mendocino, Sonoma, and Marin counties, **except for the Russian River.**



# Need for fishing regulation change:

1. Minimize impacts to listed salmonids associated with angling; particularly coho and Chinook salmon during the fall months
2. Overlap in run-timing of salmonids results in incidental catch of sensitive species – magnified during low-flow conditions
3. Increasing trend of coho salmon in the Russian River – higher probability of endangered species and angler interaction in the future
4. Climate change – potentially a higher frequency of severe low-flow conditions during the angling season



Angler caught Chinook salmon, Russian River, CA



# Lack of rain impacts Russian River coho

By **BOB NORBERG**

THE PRESS DEMOCRAT

Published: Wednesday, January 11, 2012 at 6:52 p.m.

**pressdemocrat**.com

*“The lack of rain and resulting low flow of the Russian River pose a threat to endangered coho salmon, which are having difficulty reaching their spawning grounds and could be caught and killed by fishermen.....”*



*“Bill Laurie of Santa Rosa, president of the Russian River Fly Fishers, said most fishermen know the difference, that coho have black mouths and steelhead have a white mouth. But he also acknowledged that the concerns of biologists and regulators are warranted.....”*

January 11, 2012



# Goals of fishing regulation change:

1. Enhance protection of listed salmonids during low-flow conditions - when they are most stressed and vulnerable
2. Simplify and attempt to make fishing regulations consistent
3. Provide and maintain quality angling opportunities – recognize windows of fishing opportunity to keep people interested in fishing the Russian River
4. Use fisheries data to support fishing regulation change – another value of monitoring data!



Hatchery steelhead,  
Russian River, CA



# Evaluation of existing fishing regulations = fishing regulation change proposal

## Information used:

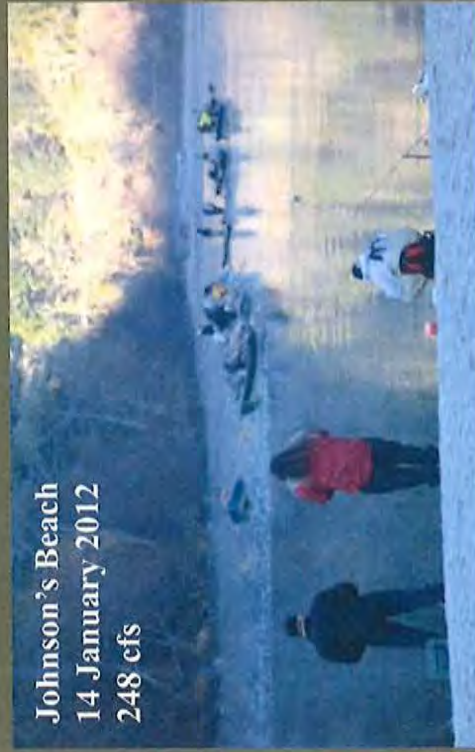
1. Hydrology data
2. Wohler video data
3. Coho monitoring data
4. Steelhead report card data
5. Field observations
6. Local angler knowledge and expertise (outreach)



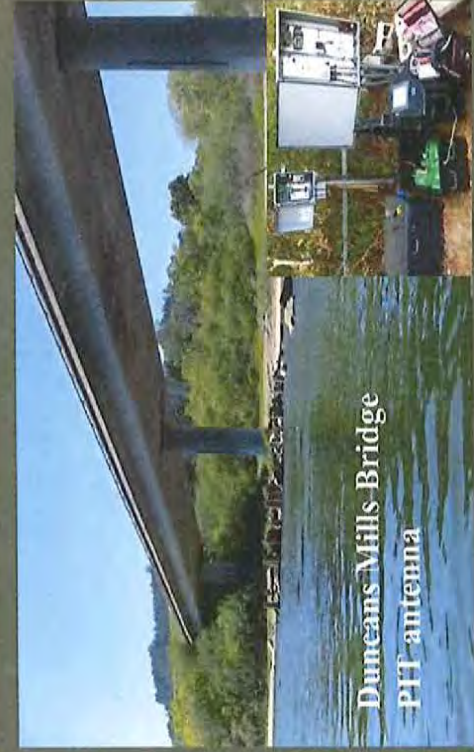




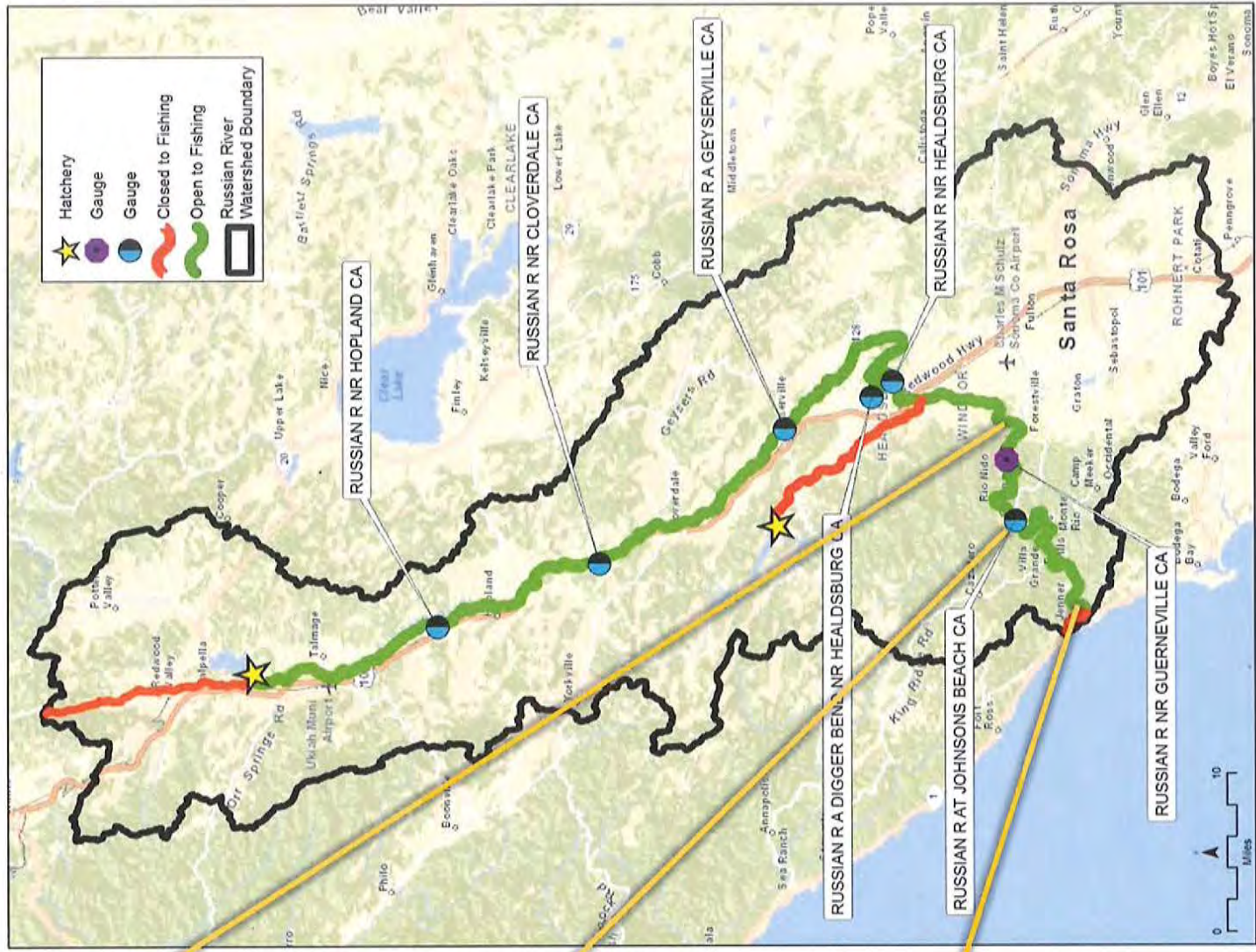
Wohler dam &  
video station



Johnson's Beach  
14 January 2012  
248 cfs

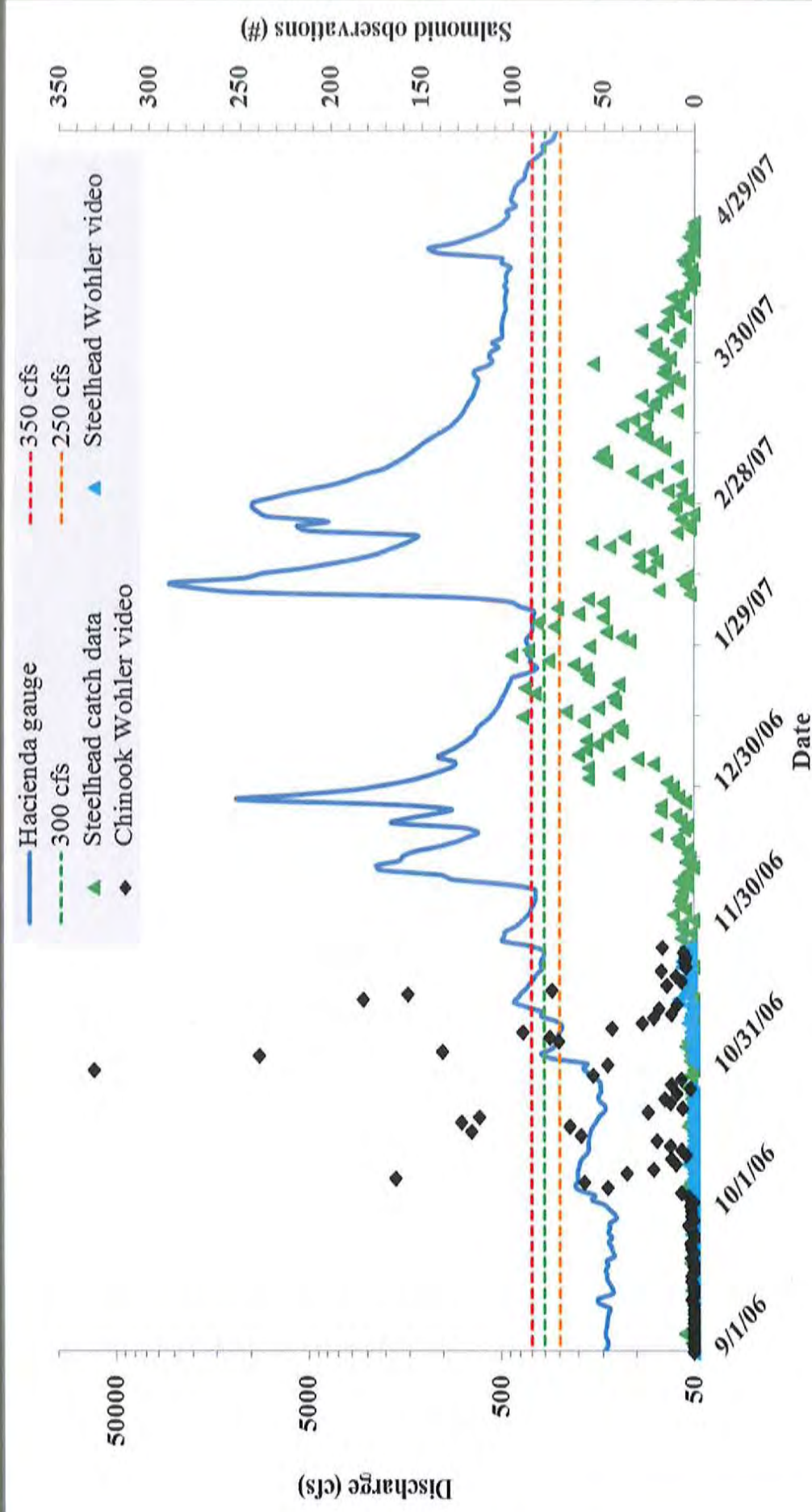


Duncans Mills Bridge  
PTF antenna





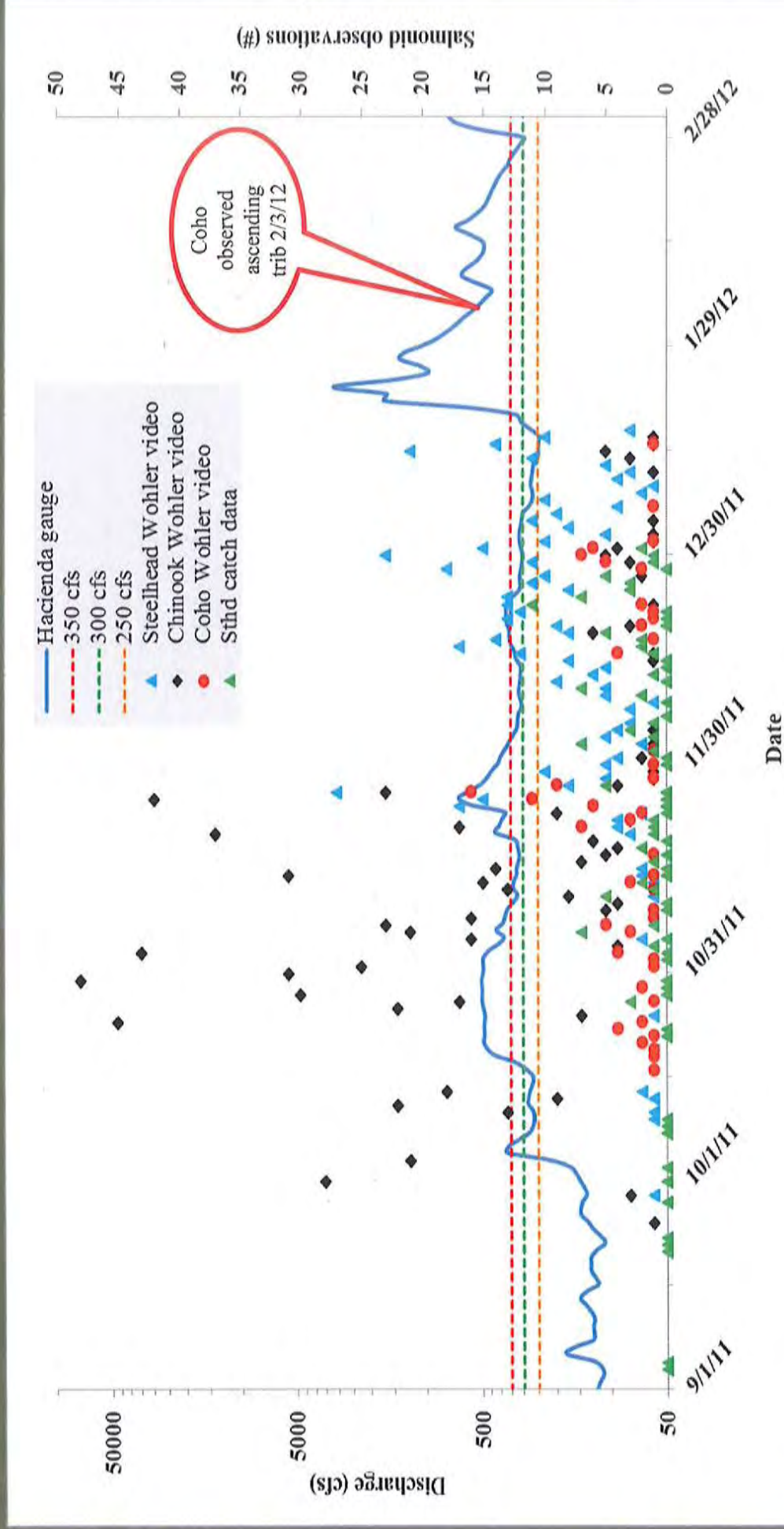
## Example: Steelhead catch data 2006/07



Salmonid observations and potential low-flow triggers superimposed on the 2006/07 Russian River at Hacienda hydrograph (September – April). Salmonid data doesn't include all Chinook observations at the Wohler video station to provide higher resolution of early arriving steelhead (scale).

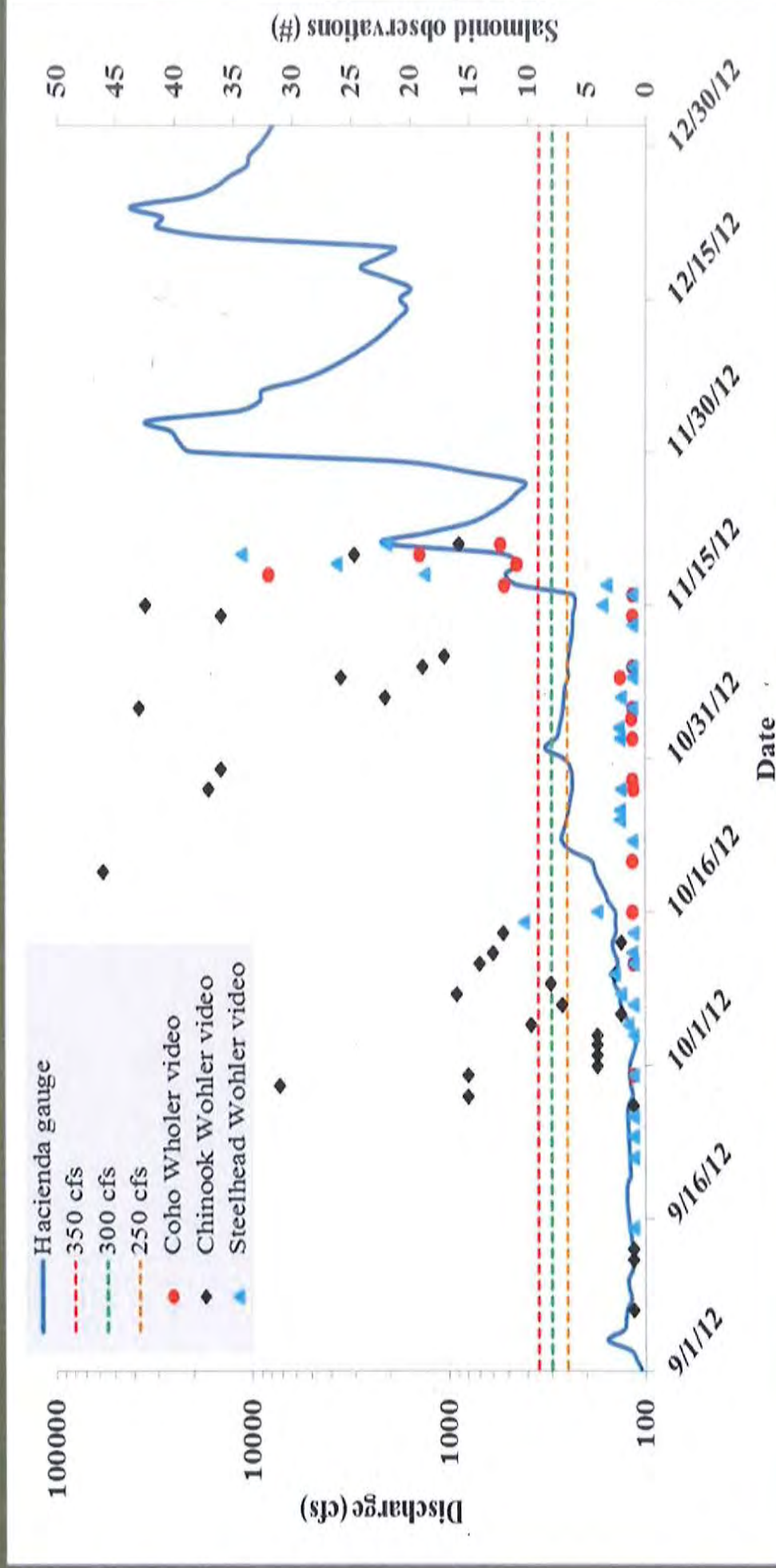


## Example: Severe low-flow conditions 2011/12



Salmonid observations and potential low-flow triggers superimposed on the 2011/12 Russian River Hacienda hydrograph (September – January). Salmonid data doesn't include all Chinook observations at the Wohler video station to provide higher resolution of observed coho salmon and steelhead (scale).

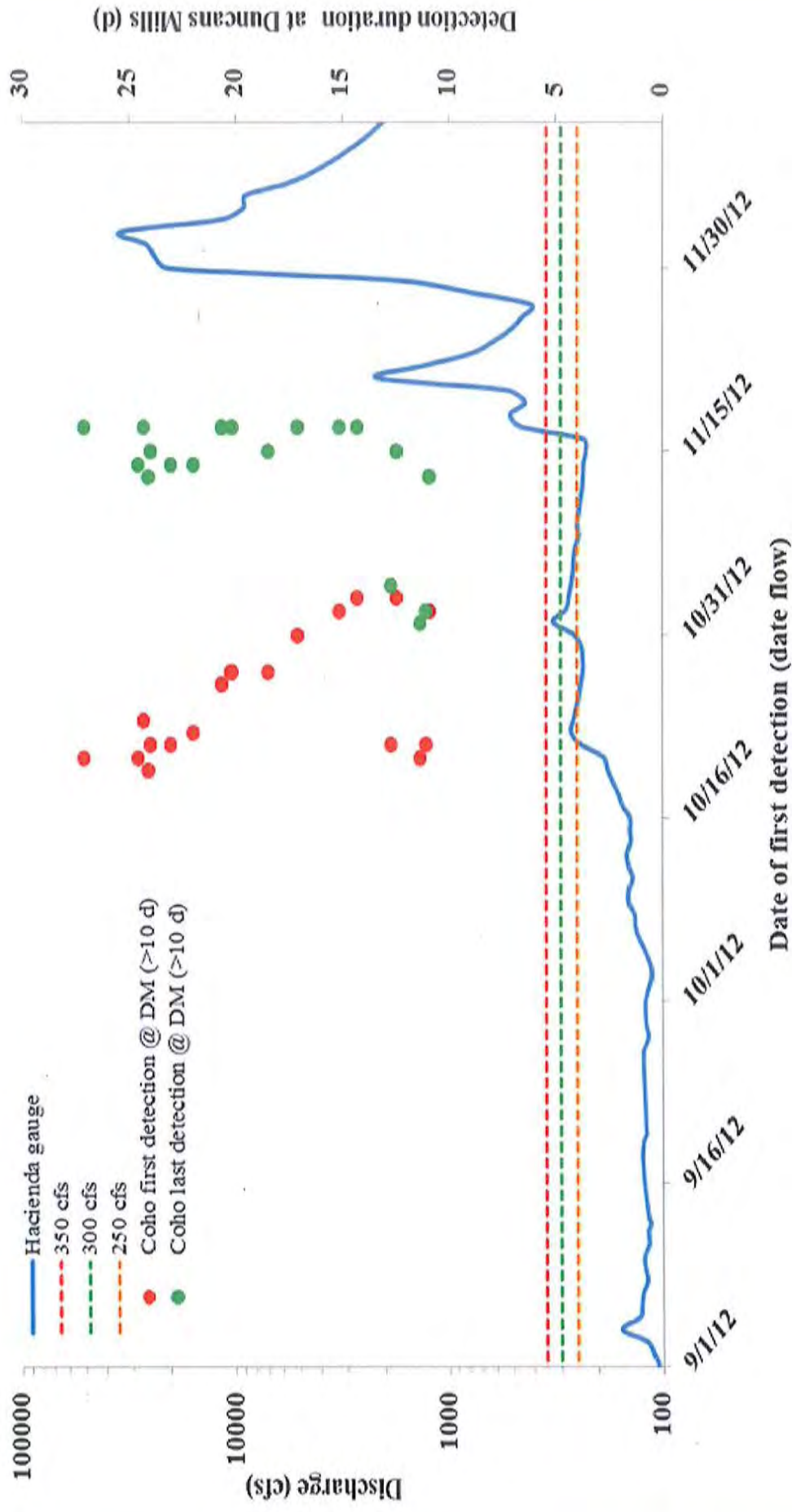
## Example: Fall 2012



Salmonid observations and potential low-flow triggers superimposed on the 2012 Russian River Hacienda hydrograph (September – December). Salmonid data doesn't include all Chinook observations at the Wohler video station to provide higher resolution of observed coho salmon and steelhead (scale).

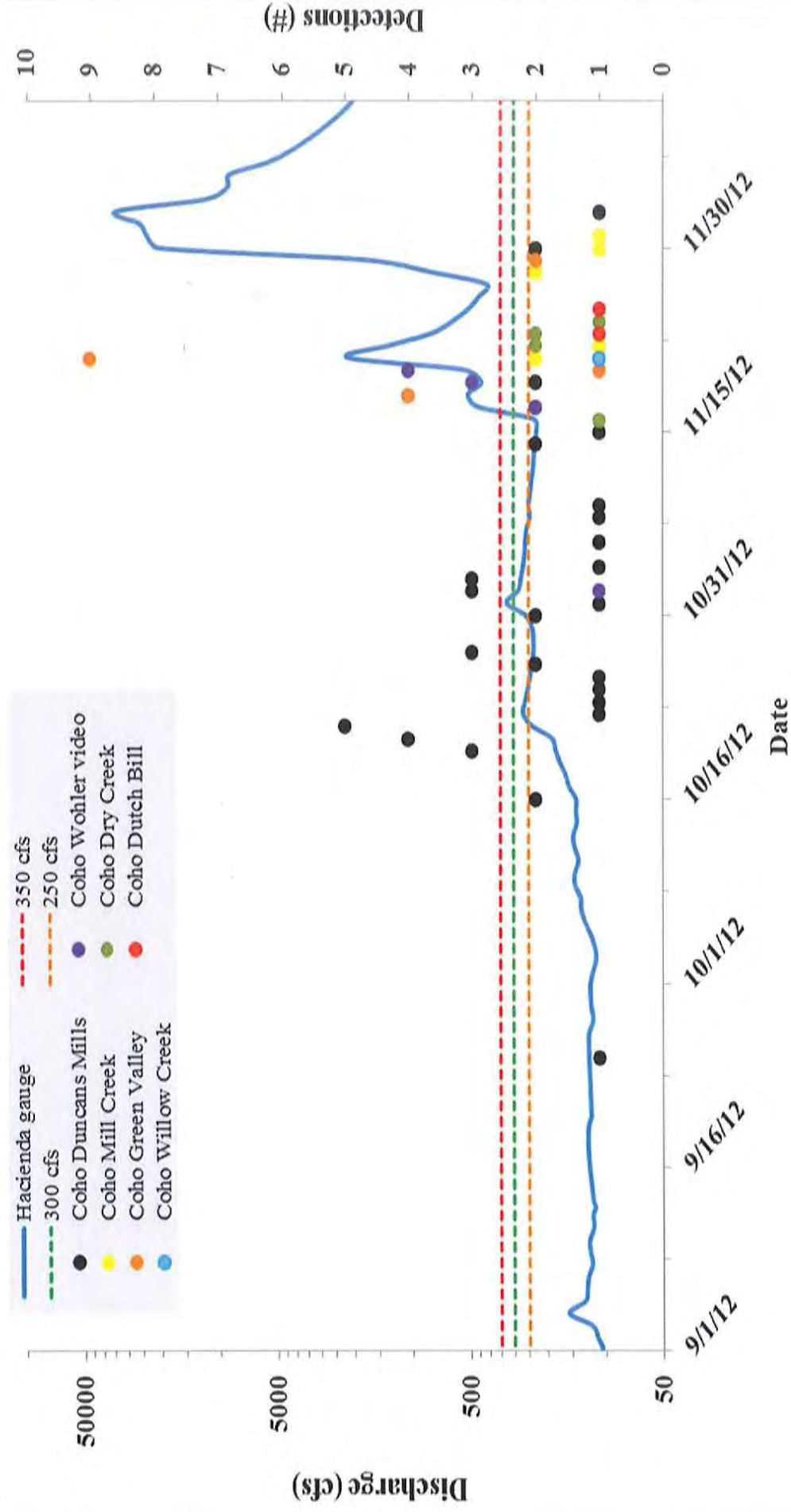


## Coho PIT detections at Duncans Mills: Fall 2012



Detection duration of PIT tagged coho salmon at Duncans Mills. Data indicates that many coho salmon staged at the Duncans Mills site until flows exceeded 350 cfs. Data includes only coho salmon that staged at the Duncans Mills for > 10 d.

# Coho PIT tag detections: Fall 2012



Coho salmon PIT detections at various PIT antenna locations within the Russian River. Data indicates that coho salmon didn't arrive in tributary streams until flows exceeded 350 cfs at the Russian River Hacienda gauge.



# Number of fishing days analysis: 2004 - 2013

Flow (cfs)	Year										% Total (d)
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13		
September – November (91 d)											
< 250 [% (d)]	52 (47)	60 (55)	71 (65)	86 (78)	88 (80)	85 (77)	46 (42)	37 (34)	73 (66)	66 (544)	
< 300 [% (d)]	57 (52)	82 (75)	78 (71)	100 (91)	91 (83)	95 (86)	47 (43)	53 (48)	85 (77)	78 (628)	
< 350 [% (d)]	78 (71)	91 (83)	88 (80)	100 (91)	93 (85)	96 (87)	47 (43)	62 (56)	85 (77)	83 (679)	
< 500 [% (d)]	97 (88)	92 (84)	100 (91)	100 (91)	97 (88)	100 (91)	56 (51)	92 (84)	89 (81)	91 (749)	
December (31 d)											
< 250 [% (d)]	0 (0)	0 (0)	0 (0)	0 (0)	45 (14)	16 (5)	0 (0)	0 (0)	0 (0)	7 (19)	
< 300 [% (d)]	0 (0)	0 (0)	0 (0)	16 (5)	61 (19)	35 (11)	0 (0)	0 (0)	0 (0)	13 (35)	
< 350 [% (d)]	13 (4)	0 (0)	16 (5)	23 (7)	68 (21)	39 (12)	0 (0)	74 (23)	0 (0)	24 (68)	
< 500 [% (d)]	19 (6)	19 (6)	32 (10)	52 (16)	74 (23)	68 (21)	0 (0)	100 (31)	0 (0)	41 (113)	
January (31 d)											
< 250 [% (d)]	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	13 (4)	0 (0)	1 (4)	
< 300 [% (d)]	0 (0)	0 (0)	0 (0)	0 (0)	35 (11)	0 (0)	0 (0)	42 (13)	0 (0)	9 (24)	
< 350 [% (d)]	0 (0)	0 (0)	3 (1)	0 (0)	55 (17)	0 (0)	0 (0)	61 (19)	0 (0)	13 (37)	
< 500 [% (d)]	0 (0)	0 (0)	42 (13)	0 (0)	94 (29)	23 (7)	0 (0)	61 (19)	0 (0)	24 (68)	
February – March (59/60 d)											
< 250 [% (d)]	0 (0)	0 (0)	0 (0)	0 (0)	8 (5)	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	
< 300 [% (d)]	0 (0)	0 (0)	0 (0)	0 (0)	8 (5)	0 (0)	0 (0)	2 (1)	0 (0)	1 (6)	
< 350 [% (d)]	0 (0)	0 (0)	8 (5)	0 (0)	10 (6)	0 (0)	0 (0)	5 (3)	0 (0)	3 (14)	
< 500 [% (d)]	0 (0)	0 (0)	14 (8)	0 (0)	19 (11)	0 (0)	0 (0)	37 (22)	10 (6)	9 (47)	
< 500 [% (d)]	44 (94)	42 (90)	58 (122)	50 (107)	71 (151)	56 (119)	24 (51)	74 (156)	41 (87)	51 (977)	
< 350 % Total (d)	35 (75)	39 (83)	43 (91)	46 (98)	61 (129)	47 (99)	20 (43)	47 (101)	36 (77)	42 (798)	
< 300 % Total (d)	24 (52)	35 (75)	33 (71)	45 (96)	55 (118)	46 (97)	20 (43)	29 (62)	36 (77)	37 (703)	
< 250 % Total (d)	22 (47)	26 (55)	31 (65)	37 (78)	47 (99)	39 (82)	20 (42)	24 (50)	31 (66)	30 (572)	

Russian River at Hacienda gauge 2004/05 – 2012/13. Information includes the percentage and number of days estimated under potential low-flow triggers using Hacienda stream gauge. Highlighted green indicates years that experienced severe low-flow conditions. Highlighted blue indicates the proposed low-flow trigger for the Russian River using the Hacienda stream gauge. Stream flow source: USGS daily average.



## Preliminary Results:

1. Angling occurs throughout the adult salmonid migration/spawning season in the Russian River (September – April)
2. Coho are present in the lower Russian River later than January 1<sup>st</sup>, especially when low-flow conditions occur – flow driven (tributary flow driven?) – (2011/12)
3. Coho salmon staged for long periods (>25 d) at Duncans Mills when flow were below 350 cfs at Hacienda (Fall 2012)
4. Angling pressure can be intense when salmonids are staging in lower river pools (<350 cfs) – worst situation (2011/12)
5. A low-flow trigger of 350 cfs provides protection for migrating and spawning (upper river) salmonids during low-flow conditions (especially during the fall) while providing adequate angling opportunity for hatchery steelhead



## Russian River fishing regulation in question:

*Chapter 3. Article 4. Supplemental Regulations. 8.00. Low-Flow Restrictions. (b) Central Coast Streams – Stream Closures: Special Low Flow Conditions. From October 1 through April 1, any of the stream reaches listed in subsection (1) and (2) ... (1) The Sonoma Creek (Sonoma County), and all streams tributary to the Pacific Ocean (and its bays) in Mendocino, Sonoma, and Marin counties, **except for the Russian River.** Page 68 – 69.*



# Proposed alternatives:

## Alternative (1):

Low-flow restrictions based on the Russian River stream gauge near Guerneville

Russian River main stem below the confluence of the East Branch Russian River (Mendocino and Sonoma counties) will close when the following low-flow conditions exist:

- **Minimum Flow:** From September 1 through April 1, **350 cfs** at the gauging station located on the main stem Russian River near the town of Guerneville (USGS 11463500 or CDEC HAC; Sonoma County).
- 

## Alternative (2): (See Mad River)

Low-flow restrictions based on the Russian River stream gauge near Guerneville

Russian River main stem below the confluence of the East Branch Russian River (Mendocino and Sonoma counties) will close when the following low-flow conditions exist:

- **Minimum Flow:** From September 1 through January 31, **350 cfs** at the gauging station located on the main stem Russian River near the town of Guerneville (USGS 11463500 or CDEC HAC; Sonoma County).



# Other efforts:

## Attention Anglers!

If Mouth has Black, Put It Back!

It's illegal to keep Russian River Coho Salmon, Chinook Salmon, and Wild Steelhead



Coho Salmon\*\*



Chinook Salmon\*\*



Steelhead\*\*\*

Coho Salmon Recovery Program Partners:



CDFG Fish Phone: 707-944-5594  
CALTIP: 1-888-DFG-CALTIP NOAA OLE: 1-800-853-1964

Photography Credits: \* California Department of Fish & Game, \*\* Washington Department of Fish & Wildlife, \*\*\* National Marine Fisheries Service, National Coastal Water Agency



Coho salmon, Russian River, CA - 28 November 2008

PROCEEDINGS  
OF THE  
ROYAL  
SOCIETY



Proc. Zool. Soc. Lond.  
640 (2008) pp. 2011-2019  
doi:10.1098/rzsl.2008.0001

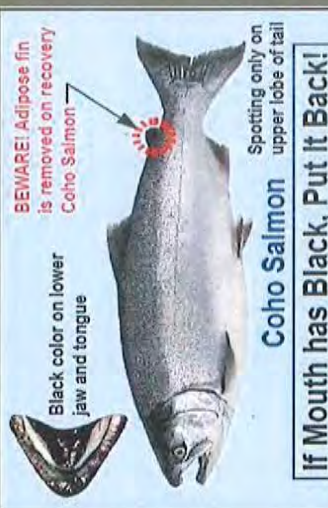
### Neural network detected in a presumed vestigial trait: ultrastructure of the salmonid adipose fin

J. A. Buckland-Nicks<sup>1,2</sup>, M. Gillis<sup>1</sup> and T. E. Reimchen<sup>1</sup>

<sup>1</sup>Department of Biology, St. Francis Xavier University, Antigonish, Nova Scotia, Canada B9G 2X5  
<sup>2</sup>Department of Biology, University of Toronto, Toronto, Ontario, Canada M5S 1A5

A wide variety of rudimentary and apparently non-functional traits have persisted over extended evolutionary time. Recent evidence has shown that some of these traits may be maintained as a result of developmental constraints or neutral evolutionary drift, but for others their true function was not recognized. The adipose fin is a small, fleshy, unpaired and located between the dorsal and caudal fins in eight species of bivalve molluscs and has traditionally been regarded as a vestigial structure. We describe here the ultrastructure of the adipose fin and for the first time, in our knowledge, present evidence of its function. As well as an unusual subdermal complex of interconnected sensory-like cells equipped with primary cilia. The fin contains another adipose tissue and fat cells. Many features are unique, including dense reticular connective tissue, support the fine edge and connect with collagen cables that link the fin to the body. These results are consistent with a recent hypothesis that the adipose fin may serve as a protrudible fin sensor, rather than a fin. The fin is a rudimentary structure that is a vestigial trait. Our findings provide insight into the broader function of fin structures and contribute to evolutionary biology and may have significance for fisheries science, as the adipose fin is routinely removed from molluscs of some species each year.

Keywords: bivalve mollusc; adipose fin; sensory network; sensory; primary cilia; bivalves



Coho Salmon

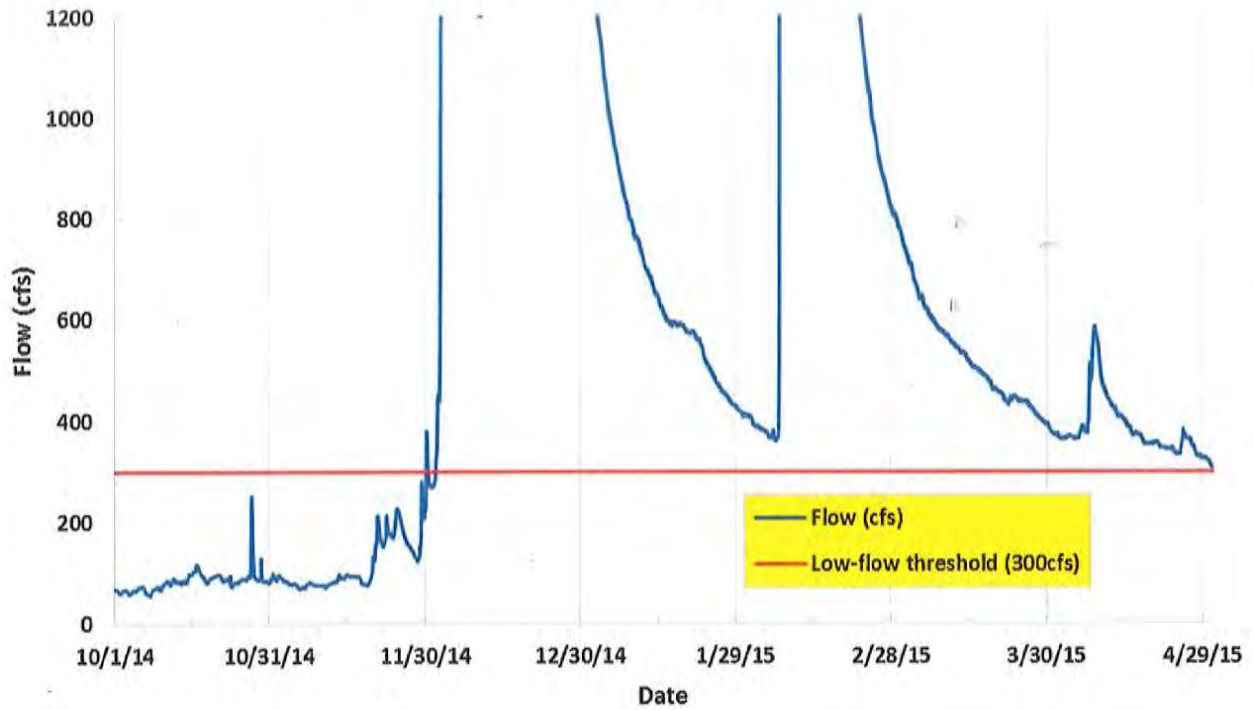
If Mouth has Black, Put It Back!



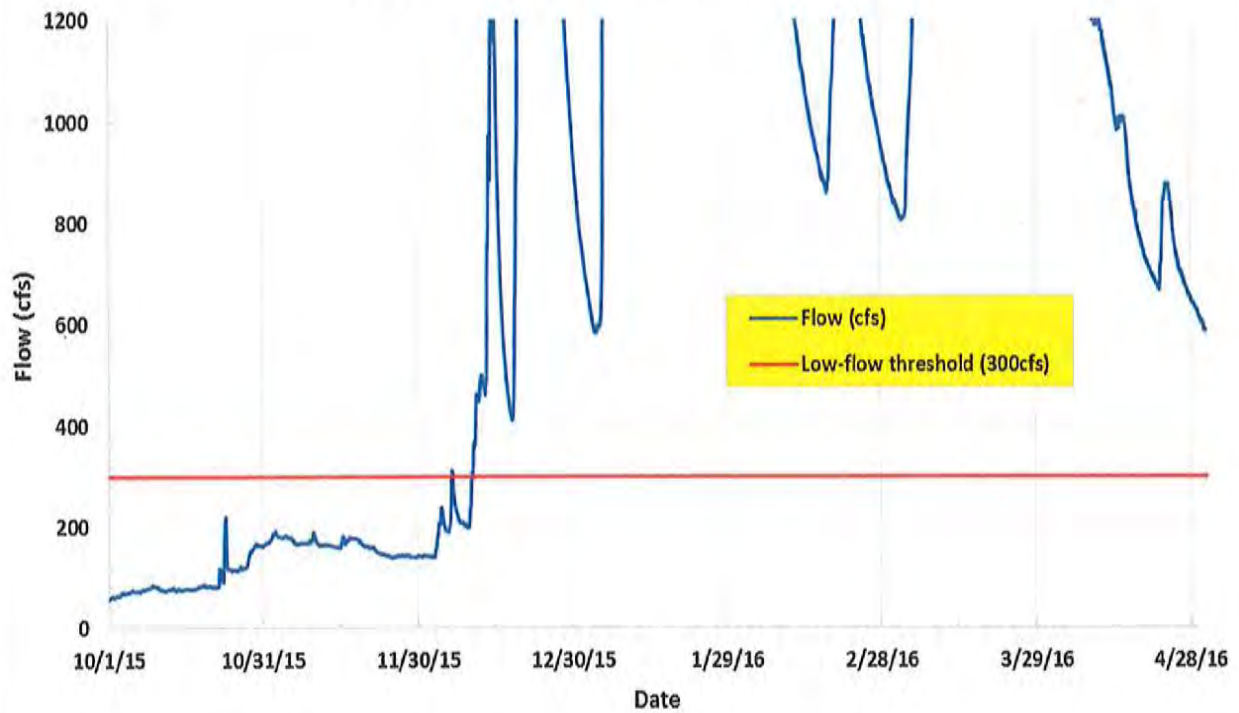
Steelhead Trout



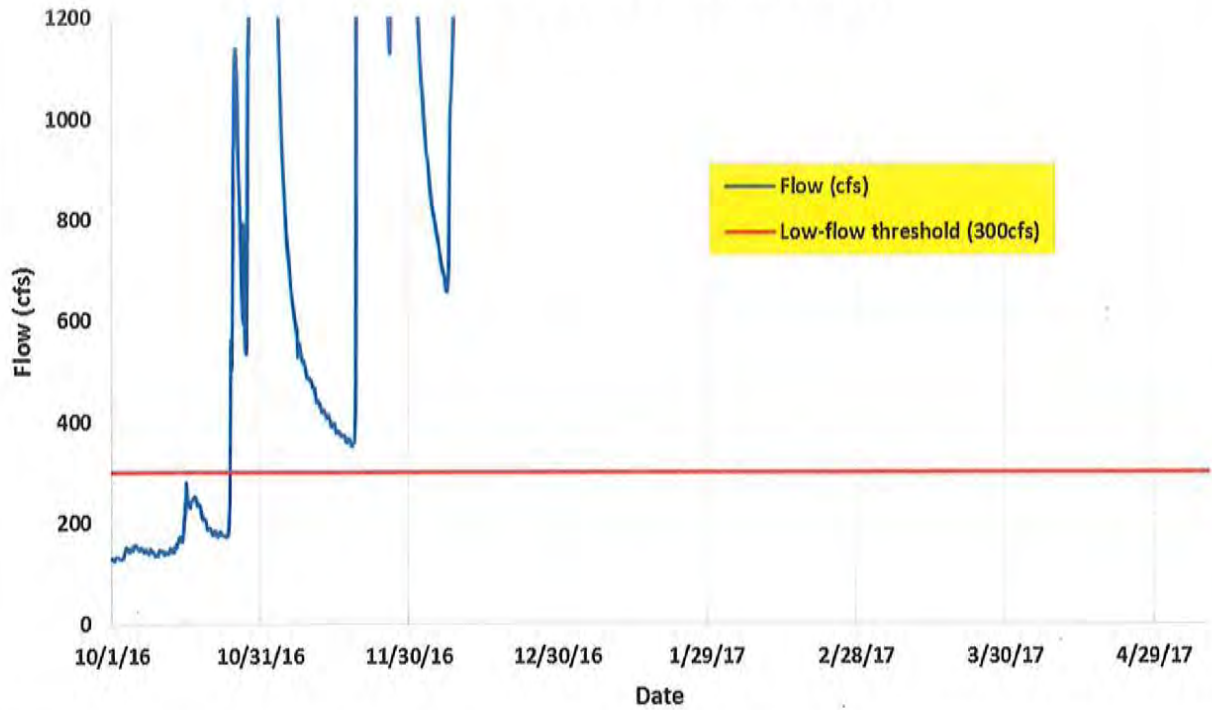
Russian River at Guerneville 2014\_15



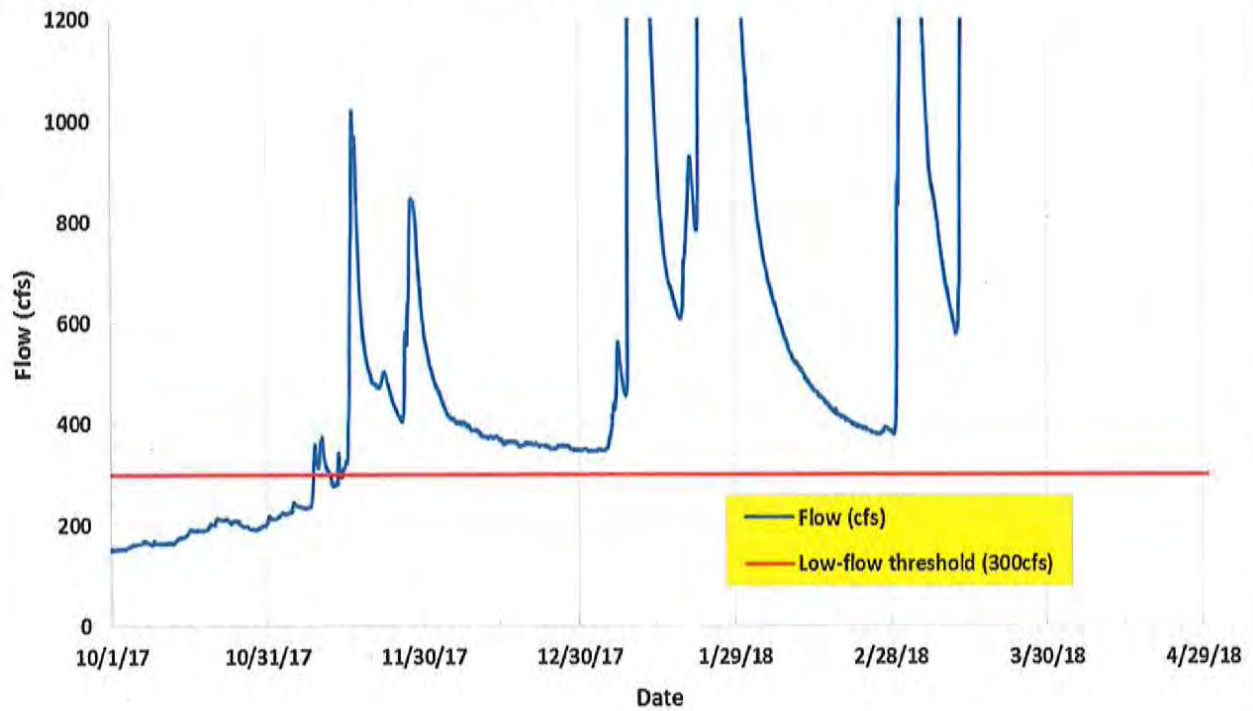
Russian River at Guerneville 2015\_16



Russian River at Guerneville 2016\_17



Russian River at Guerneville 2017\_18




State of California  
Department of Fish and Wildlife

## Memorandum

Date: April 24, 2018

To: Kevin Shaffer  
Branch Chief, Inland and Anadromous Fisheries  
California Department of Fish and Wildlife

From: Neil Manji   
Regional Manager, Northern Region  
California Department of Fish and Wildlife

Gregg Erickson   
Regional Manager, Bay Delta Region  
California Department of Fish and Wildlife

Subject: **Northern Region and Bay Delta Region Response Regarding Fishing Regulation Change (Petition Number 2015-015)**

On December 16, 2015, the California Fish and Game Commission (FGC) received a petition for regulation change authored by Fred Boniello (petition tracking number 2015-015) recommending changes to freshwater fishing regulations at locations in California Department of Fish and Wildlife (CDFW) Northern (R1) and Bay Delta (R3) regions. R1 and R3 fisheries management staff met to consider the proposed regulation change recommendations, and this memo is a coordinated R1 and R3 response to CDFW Fisheries Branch and FGC regarding the petition.

### Petition Summary

The petitioner recommends change to Title 14, California Code of Regulations:

Chapter 3, Article 3, Section 7.50(b) (155) (A) - Alphabetical List of Waters with Special Fishing Regulations subsections relevant to the Russian River: Russian River main stem below the confluence of the East Branch Russian River.

Chapter 3, Article 4, Section 8.00(b) (3) - Low-Flow Restrictions Mendocino, Sonoma, and Marin County coastal streams, subsections relevant to the Russian River: River main stem below the confluence of the East Branch Russian River (Mendocino and Sonoma counties).



Proposed amendments to subsections of 7.50(b):

- Amend Section 7.50(b) to permit a no take "Catch and Release" of all migratory species including hatchery fish.
- Amend Section 7.50(b) to permit a year-round restriction for the use of bait (artificial bait only permitted) and include current hook requirements such as barbless and single.
- Amend Section 7.50(b) to permit a year-round closure from the point of the CDFW Coho Salmon reestablishment monitoring project (near the confluence of Austin Creek) to the Pacific Ocean.

Proposed amendments to subsections of 8.00(b):

- Amend Section 8.00(b) to open the Russian River to sport fishing all year with no minimum flow requirement.

**Background:** On December 3, 2014, the FGC adopted changes to Chapter 3, Article 3, Section 7.50(b). The petitioner now proposes changes to the same section of the regulations related to low flow angler restrictions, gear type, and seasons in the Russian River (Mendocino and Sonoma counties). The petitioner's supporting rationale identifies the newly adopted low flow angler closure flows as preventing fishing opportunity for long periods of time. R1 and R3 believe the flow data during the low-flow season (October to April) from 2015- 2018 (Figures 1-6), indicated the current regulation appropriately balances the opportunity for steelhead angling under favorable flow conditions with protection for Chinook Salmon, Coho Salmon, and steelhead by closing fishing during periods of low stream flow.

Unlike other coastal streams in the area, the Russian River does not follow a natural stream flow regime as it is a regulated system controlled by water releases from the Warm Springs Dam and the Coyote Valley Dam. Additionally, the estuary must be periodically breached by the Sonoma County Water Agency to prevent flooding which allows adult salmonids to enter the Russian River under less optimal migration conditions. The Russian River supports two federally threatened species—California Coastal (CC) Chinook Salmon and Central California Coast (CCC) steelhead—as well as the federally and State endangered CCC Coho Salmon. To continue to provide steelhead fishing opportunities a minimum low-flow level was established to protect these listed species under adverse stream conditions and reduce take and fishing-related mortalities. The current regulation controls the opening and closing of the Russian River main stem below the confluence of the East Branch Russian River (Mendocino and Sonoma counties) to angling based upon data from the best available regional USGS flow gauge (USGS 1146700 Russian River near Guerneville, CA). The gauge flow threshold to open and close angling within the regulation was established based upon hydrological data, salmonid monitoring data, steelhead report card data, migration flow criteria, and the observation and input of CDFW personnel, NOAA personnel, and anglers. R1 and R3 anticipated that fishing opportunities would be reduced in the early season when flows are lower. However, this lower flow period coincides with the time period when protection of listed species is the most needed. Opportunities during the peak steelhead season are largely unaffected.

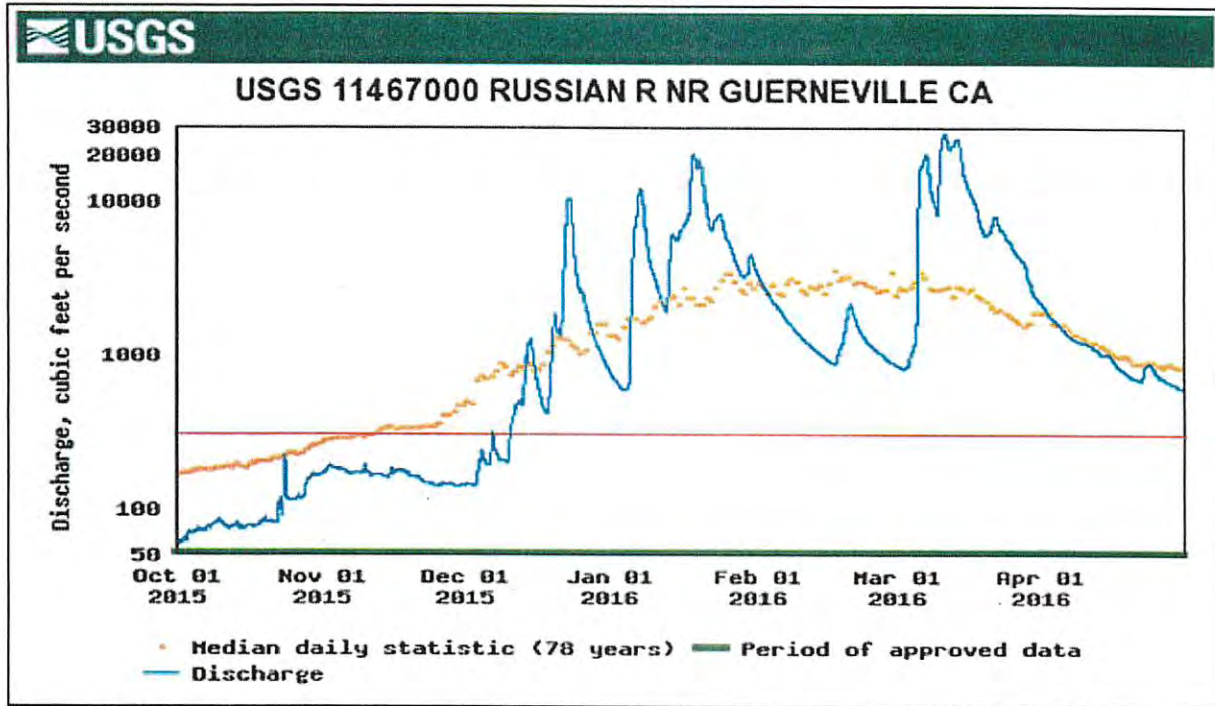


Figure 1. Stream flow measured at the Russian River gauging station near Guerneville from October 2015 through April 2016. Red line indicates the minimum flow level of 300 cfs.

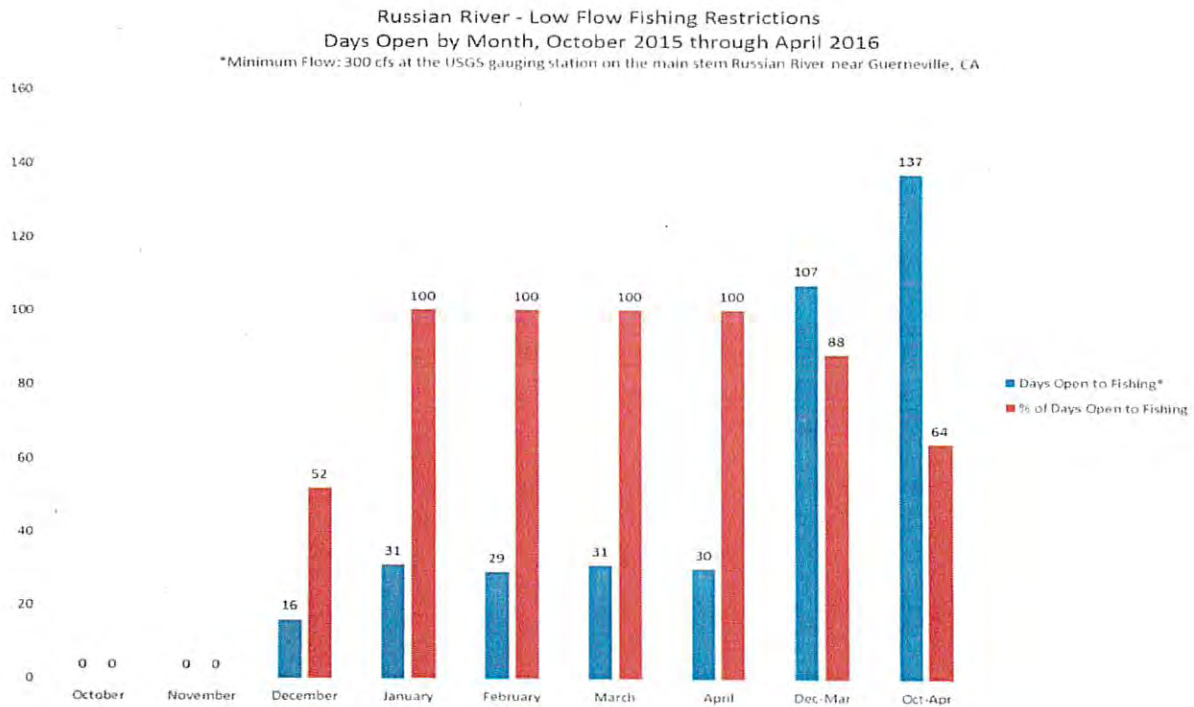


Figure 2. Number of days open to fishing by month and the corresponding percentage, as well as the overall season (October 2015 through April 2016) in Russian River.



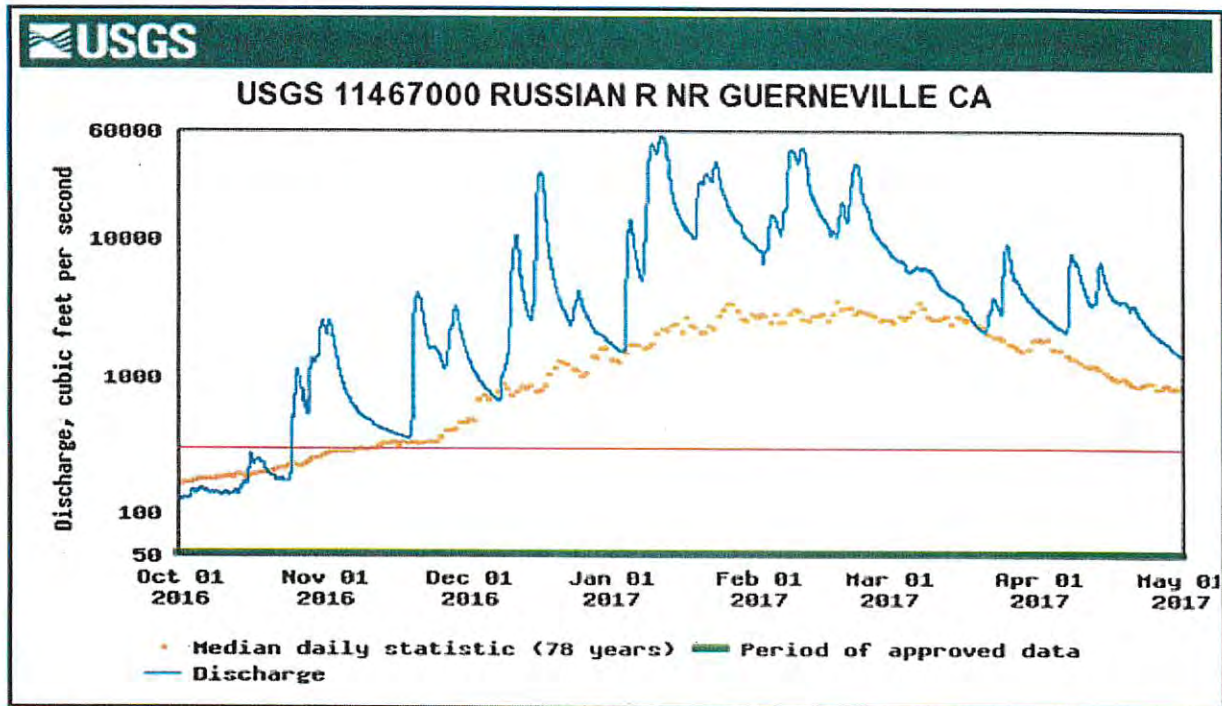


Figure 3. Stream flow measured at the Russian River gauging station near Guerneville from October 2016 through April 2017. Red line indicates the minimum flow level of 300 cfs.

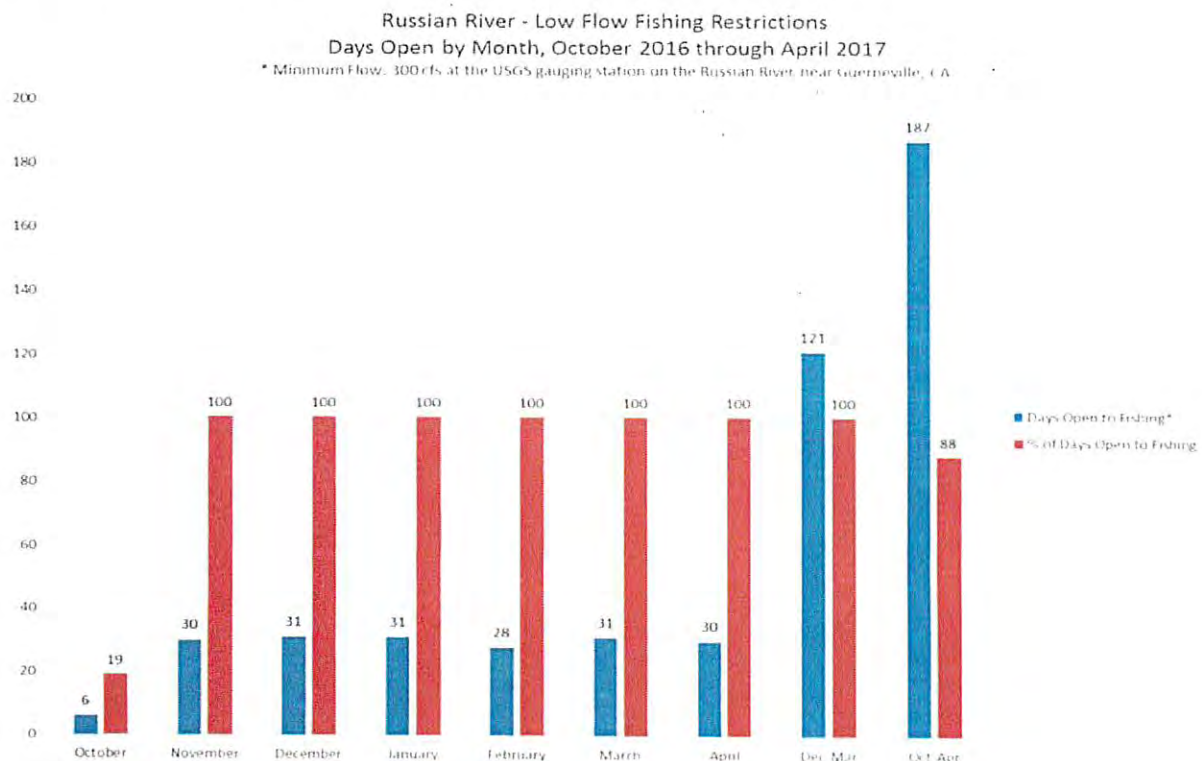


Figure 4. Number of days open to fishing by month and the corresponding percentage, as well as the overall season (October 2016 through April 2017) in Russian River.

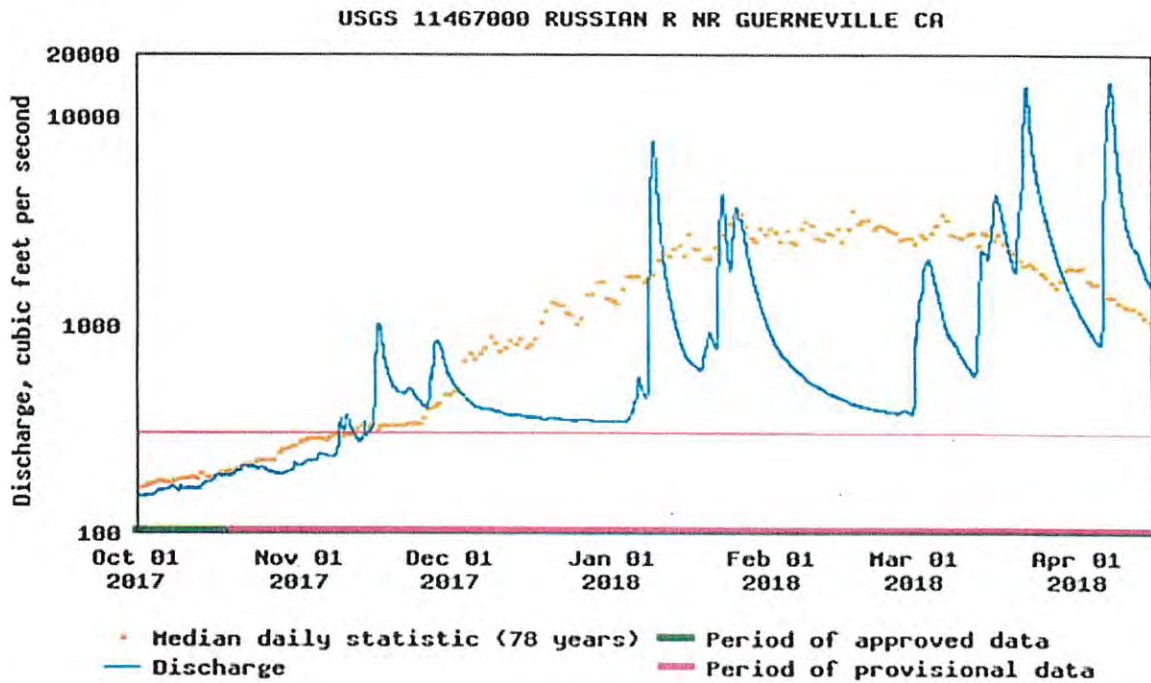


Figure 5. Stream flow measured at the Russian River gauging station near Guerneville from October 2017 through April 2018. Red line indicates the minimum flow level of 300 cfs.

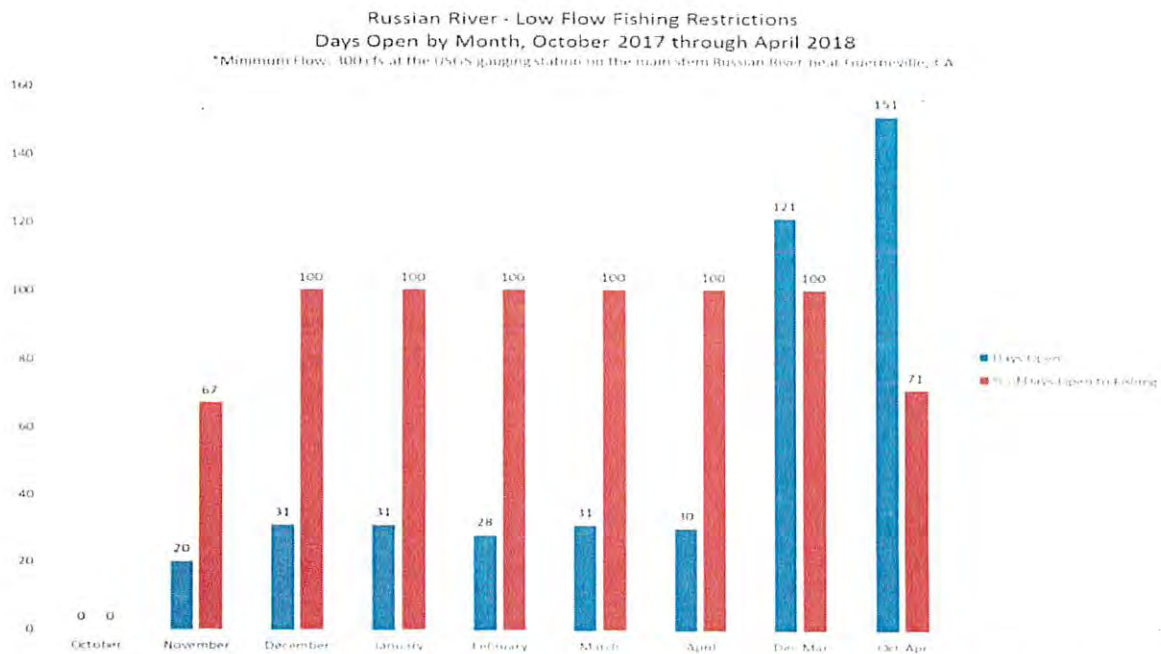


Figure 6. Number of days open to fishing by month and the corresponding percentage, as well as the overall season (October 2017 through April 2018) in Russian River.

**R1 and R3 Petition Response:** R1 and R3 do not support regulation changes proposed in the petition based upon the following responses.

**Proposed:** Amend Section 7.50(b) to permit a no take "Catch and Release" of all migratory species including hatchery fish.

**Response:** R1 and R3 do not support the proposed amendment as it would allow targeted catch and release fisheries for CC Chinook Salmon and CCC Coho Salmon. Allowing such fisheries to occur would counteract objectives and recovery actions identified in NOAA recovery plans for both species. R1 and R3 support the take of hatchery steelhead in the Russian River to reduce potential impacts to wild steelhead within the watershed.

**Proposed:** Amend Section 7.50(b) to permit a year-round restriction for the use of bait (artificial bait only permitted) and include current hook requirements such as barbless and single.

**Response:** Current regulation allows use of bait and barbless hooks only from November 1 to March 31, and only artificial lures with barbless hooks may be used from April 1 through October 31 in the subject waters. Bait fishing for steelhead is a frequently used angling method and can be effective during river conditions when there are higher flow and cloudier water. Artificial lures are more effective during lower river flow and clearer water conditions. Amending the regulation for the removal of bait gear would significantly reduce a popular angling opportunity. R1 and R3 do not support this section of the regulation change proposal at this time. Future discussion of gear restrictions should be addressed in the development of new anadromous regulations.

**Proposed:** Amend Section 7.50(b) to permit a year-round closure from the point of the CDFW Coho Salmon reestablishment monitoring project (near the confluence of Austin Creek) to the Pacific Ocean.

**Response:** The Russian River Coho Salmon Captive Broodstock Program is a collaborative partnership including the US Army Corps of Engineers, NOAA, CDFW, Sonoma County Water Agency, and the University of California Cooperative Extension/California Sea Grant Extension Program, to recover Coho Salmon within the watershed. Lower Russian River Priority Areas for Coho Salmon are identified in Figure 7 which encompasses an area much larger than the proposed closed area. R1 and R3 cannot evaluate a year-round closure of an area when an objective and rationale has not been provided. The low-flow management tool offers better protection to listed species than a spatial closure because the adverse conditions are temporal (hydrologically driven) rather than spatial. Closures are temporary as needed, and as conditions improve, fishing opportunity returns. Spatial closures close fishing opportunity and shift effort to other areas and do not provide the needed protection for migratory species.



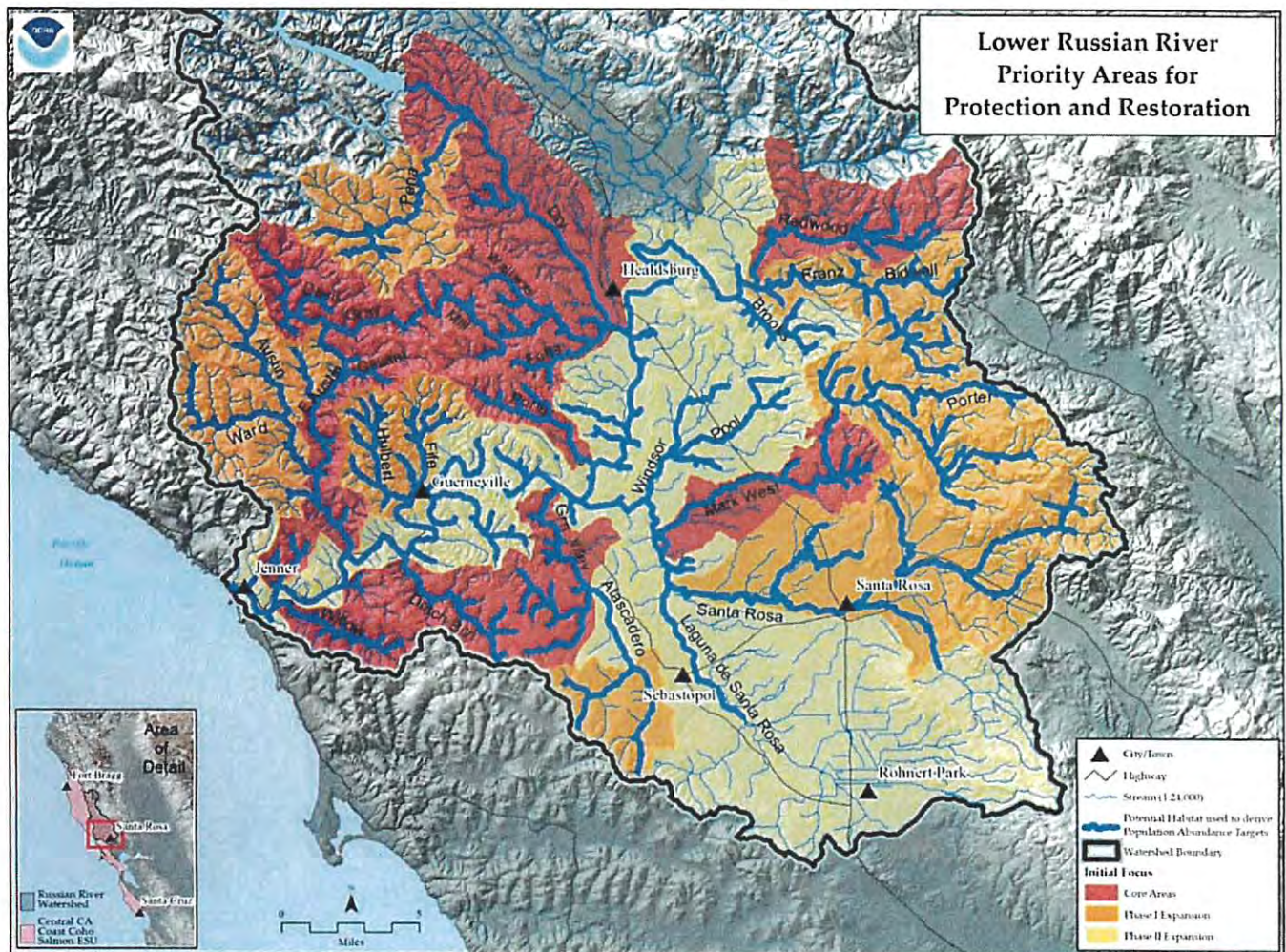


Figure 7. Lower Russian River Coho Salmon priority areas identified in the Final Recovery Plan for Central California Coast Coho Salmon (*Oncorhynchus kisutch*) Evolutionary Significant Unit.

**Proposed:** Amend Section 8.00(b) to remove the minimum flow level set forth for the Russian River main stem below the confluence of the East Branch Russian River.

**Response:** R1 and R3 do not support the removal of the minimum flow level for the Russian River. It would remove protections for listed salmonids from recreational fisheries during stream conditions that are adverse for the fish. The use of low-flow closures is a well-established fishery management tool used on other coastal streams in California. Reversing the implementation of low-flow closure regulations would undo recovery actions listed in NOAA species recovery plans. Title 14 Section 8.00(b)(3) established a low-flow closure season from October 1-April 30, and would only affect fishing under low-flow conditions during that period. Sport fishing outside this period would be unaffected by this regulation. R1 and R3 recognize that some fishing opportunity may be lost during the low-flow season, but due to the low population levels of Chinook Salmon and Coho Salmon in the Russian River these protections are necessary measures to maintain a steelhead fishery with reduced impacts to other



listed salmonids. In respect to the steelhead fishery, R1 and R3 believe ample fishing opportunity was achieved and lost opportunity occurred mainly in the early season before the peak in the steelhead run.

Please contact Allan Renger, 707-725-7194, [allan.renger@wildlife.ca.gov](mailto:allan.renger@wildlife.ca.gov); or George Neillands, 707-576-2812, [george.neillands@wildlife.ca.gov](mailto:george.neillands@wildlife.ca.gov), if you have questions or concerns regarding this response.

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[allan.renger@wildlife.ca.gov](mailto:allan.renger@wildlife.ca.gov), [george.neillands@wildlife.ca.gov](mailto:george.neillands@wildlife.ca.gov),  
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COMMITTEE STAFF SUMMARY FOR **SEPTEMBER 20, 2018****6. LOW-FLOW REGULATIONS ON COASTAL STREAMS****Today's Item****Information** ☐**Direction** ☒

Discuss potential changes to low-flow regulations on coastal streams as requested in two regulation change petitions:

- (A) Petition #2015-014: Mendocino, Sonoma and Marin counties' coastal streams
- (B) Petition #2015-015: Russian River

**Summary of Previous/Future Actions**

- |   |                                      |
|---|--------------------------------------|
| • FGC granted petition #2015-014                        | Apr 13-14, 2016; Santa Rosa          |
| • WRC discussion and recommendation                     | May 24, 2017; WRC, Sacramento        |
| • FGC referred petitions to DFW                         | Jun 21-22, 2017; Smith River         |
| • WRC discussion  | Jan 11, 2018; WRC, Santa Rosa        |
| • <b>Today's discussion and possible recommendation</b> | <b>Sep 20, 2018; WRC, Sacramento</b> |

**Background**

Regulations adopted by FGC in Dec 2014 governing recreational fishing during low-flow conditions were developed by DFW in consultation with the National Marine Fisheries Service (NMFS), stakeholders and watershed councils. The goal of the regulations was to preserve fishing opportunities while protecting fish listed under the federal and California endangered species acts.

In late 2015, FGC received two petitions to change portions of the low flow regulations:

- (A) Petition #2015-014 proposed changes to only allow artificial lures with barbless hooks to be used year-round on selected coastal streams; close all angling on selected coastal streams from Apr 1 to Oct 31; and allow angling for steelhead in the tidally influenced portions of the Gualala, Garcia and Navarro rivers when stream flows are below the current trigger for the designated gauging stations (Exhibit A1).

In Apr 2016, FGC granted the petition for consideration in the 2018-19 sport fishing rulemaking. At the May 2017 WRC meeting, DFW presented its proposed changes to sport fishing regulations, and recommended that the changes proposed in the petition be identified as alternatives considered but rejected. After further discussion, WRC recommended removing the petitioned changes from the sport fishing rulemaking to allow for further vetting with the affected stakeholder community; at its Jun 2017 meeting, FGC approved the WRC recommendation.

- (B) Petition #2015-015 proposed changes to only allow artificial lures with barbless hooks to be used year-round and remove the minimum flow requirement on the main stem of the Russian River. The petition also requested continuing the year-round closure in the Coho re-establishment monitoring project area (Exhibit B1).

## COMMITTEE STAFF SUMMARY FOR SEPTEMBER 20, 2018

In Apr 2016, FGC referred the petition to DFW for further evaluation. In Dec 2016, FGC adopted a DFW recommendation to refer the petition to WRC for additional vetting with potentially affected stakeholders. At its May 2017 meeting, WRC recommended combining discussion of the petition with Petition #2015-014; FGC adopted the WRC recommendation in Jun 2017.

There was further discussion on both petitions at the WRC meeting in Jan 2018. Today, DFW staff will update WRC on the results of stakeholder engagement efforts and provide recommendations for WRC consideration.

**Significant Public Comments (N/A)****Recommendation**

**FGC Staff:** Approve DFW recommendation to deny petition #2015-14 and petition #2015-15.

**DFW:** Deny Petition #2015-14 and Petition #2015-15 for the reasons identified in exhibits A2 and B2.

**Exhibits**

- A1. Petition #2015-014, received Dec 15, 2015
- A2. DFW memo regarding Petition #2015-014, received Sep 7, 2018
- A3. Attachment to Exhibit A2: Letter from NMFS to DFW regarding Petition #2015-014, dated Jun 29, 2018, received Sep 7, 2018
- A4. Attachment to Exhibit A2: Memo from DFW Northern Region and DFW Bay Delta Region regarding Petition #2015-014, dated Oct 13, 2016, received Sep 7, 2018
- B1. Petition #2015-015, received Dec 16, 2015
- B2. DFW memo regarding Petition #2015-015, received Sep 7, 2018
- B3. Attachment to Exhibit B2: Letter from NMFS to DFW regarding Petition #2015-015, dated Apr 4, 2018, received Sep 7, 2018
- B4. Attachment to Exhibit B2: Memo from DFW Northern Region and DFW Bay Delta Region regarding Petition #2015-015, dated April 24, 2018, received Sep 7, 2018

**Committee Direction/Recommendation**

The Wildlife Resources Committee recommends that the Commission deny Petition #2015-014 and Petition #2015-15.

**OR**

The Wildlife Resources Committee recommends that the Commission Petition #2015-014 and Petition #2015-15.

# California Biodiversity Initiative

## A Roadmap for Protecting the State's Natural Heritage



September 2018





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## Introduction

California is a world biodiversity hotspot. Among the fifty states, California is home to more species of plants and animals and the highest number of species found nowhere else. This richness spans the entire state from the coast to the mountains, in cities and on farms, and throughout the valleys and deserts. Together, the State's plants and animals co-exist to create the complex and beautiful ecosystems upon which so much of the State's people and economy depend. Even after decades of economic and population growth, California has managed to maintain much of this biodiversity.

However, a concerted, synergized set of actions led by the State of California, in partnership with others, is necessary to maintain California's biodiversity into the future. Global warming is changing ecosystems at an unprecedented pace, posing direct threats to the State's plants, animals, and the habitats in which they live.

California is the most populous state in the nation. Our population is projected to reach 50 million by the middle of this century, which will require investments in transportation, infrastructure, housing, and other things. All of these decisions are being made in the context of the ambitious goals to address climate change, water management, air quality, and a range of other important environmental and public health challenges. This Initiative and Roadmap provide a starting point to recognize and integrate biodiversity protection into the State's environmental and economic goals and efforts.

## The Goal of this Biodiversity Initiative and Roadmap

***The goal of this Biodiversity Initiative and Roadmap is to secure the future of California's biodiversity.*** This goal is not a value judgment picking winners or losers between the environment and the economy. Securing biodiversity benefits the State's short- and long-term environmental and economic health. The exceptional story of California is well known. California is home to a culture of innovation and creativity. We are a global leader in so many areas, including planning for climate change. We can also be world leaders for biodiversity conservation.

California's lands span more than 158,000 square miles with over 4,900 lakes and reservoirs, 175 major rivers and streams, and 1,100 miles of coastline. The deserts, mountain ranges, vast valleys, wetlands, woodlands, rivers, estuaries, marine environments, and rangelands and agricultural fields of California provide habitats for approximately 650 bird species, 220 mammals, 100 reptiles, 75 amphibians, 70 freshwater fish, 100 marine fish and mammals, and 6,500 taxa of native plants.

Protection and recovery of the State's biodiversity requires the following. First, we must identify what needs to be protected and establish goals. Second, strategies must be put in place to protect, manage and restore ecosystems to achieve these goals. Then, we must monitor progress toward achieving goals then adapt and adjust as we learn.

This Initiative and Roadmap embrace these broad goals:

- Secure the future of all existing native California species, with an emphasis on those that are not found anywhere else.
- Secure all California ecosystem types, establishing goals that are consistent with global commitments under The Convention on Biological Diversity. A starting point is to:
  - Protect 20 percent of each terrestrial, freshwater, coastal, and marine ecosystem type; and,
  - Recover and restore 15 percent of each ecosystem type from its degraded or disturbed status.
- Preserve ecosystems at the regional scale, with sufficient linkages, buffers and refugia to provide a robust future for all native species in the face of climate change.
- Increase ecosystem and native species distributions in California, while sustaining and enhancing species abundance and richness.
- Improve the ecological conditions, ecosystem functions, and natural processes vital for sustaining these ecosystems across California. These include things like connectivity of habitats, community structure and composition, water quality, and soil and sediment quality, as well as successional dynamics, disturbance regimes, hydrological regimes, and sediment and soil processes.

Finally, efforts ***must increase in size and accelerate in pace*** to achieve these goals in collaboration across all sectors and communities.

#### [A Biodiversity Goal Complements Other Efforts](#)

This Initiative and Roadmap build on a number of ongoing State activities. Between 2010 and 2018, the Brown Administration has created a comprehensive approach to some of the State's most pressing economic and environmental challenges. Implementation of this biodiversity focus should occur alongside and in coordination with these ongoing efforts. These include the following:

- **The 2015 State Wildlife Action Plan**

The 2015 State Wildlife Action Plan details regional conservation strategies for terrestrial, freshwater aquatic, and marine resources across all geographic provinces in California. For each ecosystem, this plan specifies a timeline, measurable objectives, conservation targets, goals, and key ecological attributes in an easy to digest tabular format. The Department of Fish and Wildlife will provide this information to all State agencies and other partners. The department has also developed an ecosystem services policy.

- **Safeguarding California**

Safeguarding California is the State's climate adaptation strategy and is prepared every three years by the California Natural Resources Agency. The State's most recent "Safeguarding" plan defines climate adaptation objectives for 10 sectors, with a focus on state-level actions. The Natural Resources Agency tracks implementation of the plan and

provides annual progress reports. Safeguarding California was most recently updated in 2017.

- **Forest Carbon Plan**

The Forest Carbon Plan establishes goals for healthy forests in California, including for resilient carbon storage, under changing climate scenarios. It is a combined effort across many agencies led by the California Natural Resources Agency, CalFire, and CalEPA.

- **Scoping Plan – Natural and Working Lands Implementation Plan**

The California Air Resources Control Board is an international leader describing the approach California will take to reduce greenhouse gas emissions. Their 2017 Scoping Plan called for the development of a Natural and Working Lands Implementation Plan that will establish a goal for carbon sequestration in the State's natural and working lands and outline pathways to achieve that goal.

- **Climate Change Indicators for California**

The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment regularly reports on a set of indicators developed to understand the drivers of climate change and observed effects on physical and biological systems. The report includes thirty-six indicators that track the health of ecosystem and species' patterns and status.

- **Integrated Conservation and Development Program**

The Strategic Growth Council has developed the Integrated Regional Conservation and Development Program (IRCAD). IRCAD brings together conservation and development planning at an ecoregional scale to support more effective approaches to mitigation. IRCAD has started with pilot projects in two ecoregions of California, the Mojave Desert and the Modoc Plateau.

- **General Plan Guidelines**

The Office of Planning and Research adopts and updates General Plan Guidelines (GPG) to provide guidance to cities and counties for the development of their general plans. Updated in 2017 for the first time in over a decade, the GPG integrates climate change and sustainability considerations throughout the document.

- **California Healthy Soils Action Plan**

The California Department of Food and Agriculture created a California Healthy Soils Action Plan. This plan is an interagency effort to promote the development of healthy soils on California's farm and ranchlands through innovative farm and ranch management practices that contribute to building adequate soil organic matter, which increases carbon sequestration and reduce overall greenhouse gas emissions.

- **California Agricultural Vision (Ag Vision)**

In 2008, the Department of Food and Agriculture and the State Board of Food and Agriculture launched Ag Vision, which is an effort to plan for the future of agriculture and the food system in California in collaboration with numerous key partners. The purpose of Ag Vision is to develop and monitor progress of strategies for the sustainability of California agriculture, such as water, regulations, labor, invasive species, urbanization and others.

## What is Biodiversity?

Broadly, biodiversity refers to the variety of life at all scales, ranging from genes to species to whole ecosystems. At a regional or state scale, biodiversity is the diversity of species, habitats and vegetation types. At the species scale, biodiversity is the genetic variation within a population or among populations. Conservation biologists started using the term over the last 40 years, as they increasingly focused on the interconnections essential to ecosystem health. As biologist E.O. Wilson noted, biodiversity is a shift from a “bits and pieces” approach to a more holistic conceptualization of and approach to conservation.

The variety of life – biodiversity – in California can be explained by our unique geography, climate, geologic history, and sheer size. The species in this state have incredibly high richness (diversity), rarity (sensitivity) and endemism (found nowhere else). Add these factors together and you get one of the planet’s richest and most diverse places for life.

As we plan for the long-term resilience of the State’s native species, we must consider the ecosystems in which they thrive. The new reality of climate change requires a systemic approach that considers the connections and linked relationships across all elements, abiotic and biotic, of our State. These include the work of pollinators, nitrogen fixing bacteria, soil mycorrhizae, animals to spread seeds, and other intricate connections throughout food webs. Soil carbon is another example. These connections between many different species are central to the success of biodiversity conservation. Healthy ecosystem processes sustain plant and animal biodiversity. Ecosystems are more stable and more resilient under changing climate when they have higher diversity of species. ***This system-wide perspective is essential for the survival of California’s species and biodiversity wealth.***

California’s designation as a global biodiversity hotspot is based on the high diversity of native plant species. If we lose California’s native plants, the state’s ecosystems and biodiversity will suffer. Plants have generally received less attention than animals for conservation and protections. Therefore, while this Action Plan is about much more than plants, it draws attention to and directs state investment for native plants like no previous plan.

## Governor Brown Launches a California Biodiversity Initiative in 2018

On May 22, 2018, Governor Brown issued a proclamation declaring that day International Day for Biological Diversity and followed this proclamation with the announcement of the California Biodiversity Initiative in the May Revision to the 2018-19 budget. The final 2018-19 Budget allocates \$2.5 million to launch the California Biodiversity Initiative in partnership with Tribes,



educators and researchers, the private sector, philanthropy, and landowners. The California Biodiversity Initiative will improve understanding of the State's biological richness and identify actions to preserve, manage, and restore ecosystems to protect the State's biodiversity from climate change.

The Initiative will begin the following efforts. These immediate steps by the Brown Administration provide a foundation for future action and fall into three broad categories: Understand, Protect, and Manage.

#### **Understand:**

- The California Department of Fish and Wildlife will **update the official "Atlas of the Biodiversity of California,"** which was published in 2003. The department will work with the Department of Conservation, the Strategic Growth Council, and others to complete the update, including developing an online portal for public accessibility.
- The Department of Fish and Wildlife will take the next step with a network of partners **to survey and map all plants and vegetation in California,** with a project to finish vegetation mapping for the southern Sierra foothills.
- The Department of Food and Agriculture **will establish a Soil Carbon Map of California,** to serve as an indicator of soil health, which is key to ecosystem health and maintenance of biodiversity.

#### **Protect:**

- The California Ocean Protection Council will lead an effort in collaboration with others to **add California's Marine Protected Area Network to the International Union for the Conservation of Nature Green List of Protected Areas,** the global standard for conservation in protected areas.
- The Department of Conservation, Wildlife Conservation Board, and Strategic Growth Council in collaboration with others will convene a working group **to develop standard language for conservation easements** to provide for protection of biodiversity.
- The California Department of Transportation and Department of Fish and Wildlife will **update a 2010 statewide assessment of essential habitat connectivity** so that transportation and infrastructure modernization can help achieve biodiversity goals. This tool has improved road and highway design since 2010, but the science, data and modeling techniques have progressed and an updated connectivity analysis is necessary to integrate biodiversity conservation with transportation and infrastructure planning. Vehicle collisions produce significant wildlife mortality in the state.

#### **Manage:**

- The California Department of Food and Agriculture **will identify financial and regulatory support needed for agricultural and working lands to remain viable and productive** in the long term, and support resilient food production under changing climate conditions.

- The Department of Food and Agriculture ***will join forces with the Department of Fish and Wildlife and others to tackle head on the challenges posed by weeds and invasive species***, with an immediate focus on nutria.
- The California Department of Food and Agriculture will recognize the California Plant Rescue as a coordinated joint venture and as the State's partnership to ***save our gene resources through the long-term sustainability of the California Seed and Germplasm Bank***.
- The Department of Fish and Wildlife will take steps to bring the California Landscape Conservation Cooperative and California Conservation Partnership into the department ***with the dedication of a collaborative coordinator to assist with biodiversity actions***.

### The California Biodiversity Initiative Responds to Real Threats and Challenges

California is a diverse and varied state with a history and future inexorably tied to its natural and working landscapes of mountains, deserts, valleys, coastline, and ocean. Our stature as world leaders in sustainable technology, science, agriculture, and climate change mitigation is due in no small part to our appreciation of these natural treasures. Biodiversity is an important marker of the health and resilience of our ecosystems. California's continued success in protecting biodiversity will require even more focus as the climate changes, the population continues to grow, and associated factors stress the State's natural systems.

### Changing Climate Conditions and Extreme Events

California's climate is changing. Rising temperatures, increases in the frequency and severity of extreme events, including drought and wildfire, changing ocean conditions, and shifts in precipitation patterns all pose threats to California's plants and animals. Catastrophic events from fire and drought have profound effects for biodiversity. Scientists have already documented changes in forest composition as more trees die due to drought, fewer large trees exist in California forests, and the tree line begins at higher elevations. A 2017 study from the University of California, Davis concludes that half of California's natural vegetation – or an area ***as large as 75,000 square miles*** (approximately equal to the size of the San Francisco Bay Delta Watershed or about one-third the size of California) – is at risk if the Paris Climate Accord's targets are not met.

Increasing average temperatures and changes in extreme temperatures alter the temperature ranges in which species thrive and survive, causing stress to plants and animals. These temperature changes create a series of cascading effects, altering predator-prey relationships, causing fluctuations in food and water supplies, and exacerbating human-caused stressors like contaminants and habitat loss. Scientists have already observed range shifts in almost three-quarters of small mammals in California and over eighty percent of bird species surveyed.

California's coastal areas evolved in a dynamic zone between land and sea, including wetlands, bluffs, and intertidal habitat. An estimated 550 square miles, or 350,000 acres, of wetlands exist along the California coast. Sea level rise will inundate many of these resources and development and land use decisions can compound this problem, preventing inland migration.

Changes in ocean chemistry and circulation, and ocean warming will impact pelagic species distribution and community structure. Ocean acidification is already affecting shellfish species.

#### Loss of Species, Habitat Types and Ecosystem Services

California's wetlands and riparian woodlands and forests have suffered extensive losses. An estimated 80–90 percent of these productive and biologically diverse landscapes have been altered or lost in the past 150 years. As an example, the majestic and plentiful oak woodlands of California have shrunk dramatically. Similarly, less than 10 percent of the Central Valley's grasslands remain today. Some of California's once robust native fish populations are at or near historic lows. Declining species and lost habitat disrupt the cultural, spiritual, and ecological practices of California's Native American tribes. The seasonal timing of biological events is changing too, from bird migration to mismatched flowering times with pollinator insect emergence. California biodiversity supports ecosystem services that are good for people and the economy like carbon sequestration, timber production, crop pollination, soil fertility, tourism, and recreation, all of which decrease in value if we lose biodiversity.

#### Land Conversion and Habitat Fragmentation

Land use has been changing as the State's population continues to grow. Development decisions sometimes result in the conversion of natural and working lands to urban uses, destroying natural habitats and corridors necessary for migration of species, which are even more important under changing climate conditions. The future of biodiversity protection requires partnerships with California's agricultural and ranching communities to minimize land conversion. Working landscapes are biodiverse landscapes, providing a safe haven for native plants and animals, habitat for pollinators, and important connections for migration.

#### Invasive Species and Pests

Diseases and pests have tremendous impacts on native biodiversity, nearly eliminating susceptible species and transforming ecosystems and environmental services. Invasive plants out-compete California native plants, and invading species can affect native biodiversity by parasitism or predation. This problem is extensive across California counties. For example, quagga and zebra mussels infest reservoirs and canals, threatening billions of dollars of damage to water infrastructure. Nutria, invasive rodents of unusual size, reproduce rapidly, consume wetland vegetation at an astounding rate, and burrow into levees, causing damage to infrastructure. The old adage is true – an ounce of prevention is worth a pound of cure. Early detection and prevention can avoid more expensive long-term treatment and management.

#### Institutional Barriers

Responsibility for the protection, restoration and management of the State's natural biodiversity is carried out through the activities of our State agencies. In addition to having different missions, these agencies also have different authorities, and, in some cases, geographic or topical scopes. While this structure allows for focused efforts and initiatives, the segmenting can make it more challenging to work toward cross-cutting goals, such as those for biodiversity. Biodiversity requires thinking about the interconnected systems in the natural

world. For government to achieve biodiversity conservation, it will have to make a focused commitment to facilitate coordination across all the various State agencies and efforts.

## A Roadmap for Future Biodiversity Actions

The State will undertake the immediate tasks identified above as part of the Initiative launch. More work remains to be done. As the Brown Administration comes to a close, the set of actions outlined in the remainder of this document provide a roadmap of long-term steps for achieving our biodiversity goals.

Some of these actions are new proposals. Some are currently being planned and should be completed more rapidly, implemented in a better way, or on a larger scale. Success will require the cooperation of many partners. The State's role is to lead, help others, marshal resources and partnerships, and remove barriers to action.

The Roadmap portion of the California Biodiversity Initiative is focused on seven broad areas.

### AREA 1: Help Government Coordinate on Biodiversity Goals

Institutions across state and local government operate programs that contribute to achieving biodiversity goals established in this Initiative. Achieving these goals requires engaging the whole "system" of government in a common mission and leveraging our resources and actions to achieve a common vision. Through this coordination, the solutions and actions can become part of our collective system. They are designed to support coordination across state efforts and establish common frameworks, approaches and priorities. Actions in this area should include the following.

#### *Establish the California Biodiversity Initiative Working Group*

An immediate next step is to create a cross-agency working group co-chaired by the director of the Department of Fish and Wildlife and the secretary of the Department of Food and Agriculture to facilitate coordinated actions to achieve the State's biodiversity goals. Government must work across its institutions such as: the California Landscape Conservation Cooperative; California Biodiversity Council; Strategic Growth Council; Department of Conservation; Governor's Office of Planning and Research; Ocean Protection Council; Department of Parks and Recreation; Fish and Game Commission; Natural Resources Agency; and, California Environmental Protection Agency.

#### *Institutionalize and Maintain Support for the California Landscape Conservation Cooperative*

In 2010, the United States Department of the Interior created landscape conservation cooperatives for the application of systematic conservation planning using a largescale regional framing that accounts for future climate change. Biodiversity protection in California is so large it will not succeed without coordinated planning and government support. The Department of Fish and Wildlife collaborated with others on a memorandum of understanding creating the California Conservation Partnership for landscape

conservation of natural resources in the State. Work should continue to implement this memorandum and ensure continuity of the California Landscape Conservation Cooperative.

#### *Prioritize Actions Around Biodiversity and Align Landscape-scale Planning with Biodiversity Goals*

Examples of possible actions to prioritize and align planning efforts include:

- The protection of wetlands and coastal marshes as important carbon storage resources.
- Mapping and modeling of Important Plant Areas in California to facilitate protection and restoration of these locations.
- Biodiversity-friendly management actions on working lands, including restoration of fire regimes in managed forests and conservation grazing on rangelands.
- Opportunities for restoration of degraded or disturbed habitat with high potential to enhance biodiversity and carbon sequestration.

Regional Conservation Assessments, Regional Conservation Investment Strategies, and other planning efforts like the Natural Community Conservation Plans should include biodiversity goals as well.

#### *Update Relevant Strategic Plans to Include Biodiversity Goals*

This effort to update relevant plans should include the California Wildlife Conservation Board's Strategic Plan and other plans governing investments and policies that affect the State's biodiversity goals

### *AREA 2: Improve Our Understanding of California's Biodiversity*

To solve a problem, you must first understand the problem. Information is the key to understanding. California lacks a comprehensive and systematic approach to biodiversity assessment. The State's public trust natural resources agency – the California Department of Fish and Wildlife – lost significant funding support for statewide assessments of plants and animals decades ago. The State's world-renowned universities and research centers conduct critical scientific work, but there is a need for standardization and strategic integration across the public-private divide for core resource assessments to track the trends and status of the wealth of biodiversity in California.

In order to meet goals to preserve and protect California's biodiversity, it is necessary to develop a baseline understanding of the current status of the State's biodiversity. Doing so requires documenting where species are located, current status, and potential threats. This baseline knowledge is the foundation of intelligent action. With a full understanding, we can scientifically assess rarity, prioritize resources and efforts, and make sound conservation and development plans that are based on data. Actions in this area should include the following.



#### *Make Data and Tools Transparent and Readily Available*

State agencies should work together to publish an annual roster of State clearinghouses for monitoring data across landscapes, species, and coastal and marine environments. State agencies could also develop a network of monitoring sites across public lands to assist in tracking biodiversity and other management actions. As technology rapidly advances, the State and private partners can explore newly developed scientific approaches to biodiversity and plant assessments such as phylogenetic prioritization, GIS software, and modeling. The use of information has a nexus with building general public awareness and support for biodiversity preservation. For example, the California Biodiversity Initiative could identify specific tools to expand the resource and assessment community for Californians, including advancing community scientist efforts like rare plant treasure hunts, Bio Blitzes, CalFlora, and iNaturalist.

#### *Develop Priorities for Monitoring*

For decades, California has maintained Natural Heritage Ranks that are used by scientists, planners and developers. Future steps under the Initiative could include bringing these ranks up to date, ensuring people can make use of increasing amounts of new data, and integrating various data sets to identify Important Plant Areas.

### *AREA 3: Improve Understanding and Protection of the State's Native Plants*

Plants are one of the foundations of ecosystems. In California, native plants help establish the State's status as a global biodiversity hotspot. We are home to more than 6,500 native plant taxa, of which more than 2,000 only occur in California and nowhere else in the world. The State is home to 32 percent of all native plant taxa that occur in the United States. Knowledge and policy around the State's plant resources have generally lagged behind similar efforts for animal species. This set of actions is intended to bring greater parity in policy considerations between the State's plant and animal species. Actions in this area should include the following.

#### *Completing the Survey of California Vegetation*

The Department of Fish and Wildlife can lead a network of partners to survey and map plants and vegetation in California, to complete the Survey of California Project. Albert Wieslander led the first statewide systematic survey of California's vegetation from 1928 to 1939. That mapping project remains the most complete survey of plants and vegetation in California, but it is outdated. Since 2003, the department and others have mapped half the State with a modern, standardized and repeatable system. Half remains to be surveyed and mapped. Such an assessment will analyze distributional records from herbaria and field investigations and provide a basis for planning and funding to acquire, manage and maintain the many unique botanical values of the State not yet protected. Simultaneously, voucher specimens of rare plants could be collected during mapping to be deposited at the Department of Food and Agriculture herbarium.

### *Lead by Example*

The Department of General Services, in coordination with the Department of Food and Agriculture, can develop guidelines for native plant use in all State landscaping projects. Public outreach and education about landscaping choices is also an important task.

## **AREA 4: Manage Lands and Waters to Achieve Biodiversity Goals**

Through its acquisition, management and conservation activities, the State has tremendous opportunity to integrate the protection and preservation of California native plants, biodiversity and ecosystems into its actions. The State's investments and plans should place highest priority on protection of the most intact and biodiverse lands. Opportunities for restoration of degraded or disturbed habitat, lands critical or at risk under future climate conditions, or for enhancing carbon sequestration, should also be identified. The State's funding and granting decisions can be leveraged to accelerate integration of this action. Broad benefits may be realized by identifying and supporting biodiversity-friendly management actions on working lands, including restoration of fire regimes in managed forests and conservation grazing on rangelands. Actions in this area should include the following.

### *Maintaining and Enhancing the Long-Term Benefits of Working Landscapes*

The California Department of Food and Agriculture can identify financial and regulatory support needed for ranches and other working landscapes to remain viable and productive across generations. This should include supporting practices that maximize benefits to biodiversity and reducing the conversion of working landscapes to intensive agriculture and other uses and support resilient food production under changing climate conditions.

### *Assess and Secure the Success of Conservation Easements*

Another important action is to complete an evaluation of landowner initiatives housed within State agencies to ensure alignment of native plant and biodiversity goals with those initiatives. Such an evaluation should consider new alignment opportunities such as on-farm and rangeland leaders receiving conservation easement grants through the Department of Conservation, the Wildlife Conservation Board and the Strategic Growth Council.

## **AREA 5: Restore and Protect Lands and Waters to Achieve Biodiversity Goals**

Actions are needed to restore degraded lands and waters to provide habitat and migration corridors for species. This work must account for necessary migration corridors and refugia under changing climate conditions. Restoration activities need to consider future conditions and be designed and implemented to be resilient into the future. Restoration and protection activities need to be based on solid information gathered from communities, indigenous partners, and the latest science.

### *Accelerate the Pace of Restoration*

The State should engage the scientific community to develop state of the art, credible and effective guidelines for restoration, evaluate standard practices, and recommend actions based upon specific practices that are successful with targeted vegetation and species'

restoration goals. A leader of this effort could be the Natural Resources Agency, who has taken progressive steps through its CalEcoRestore program to accelerate restoration permitting and do more habitat restoration faster in the Bay-Delta than in prior decades.

*Work with Tribes to Use Traditional Ecological Knowledge to Support Management and Restoration Activities*

The State should also establish a collaborative to support integration of tribal partners in restoration and management activities. Leaders of this effort could include the Native American Heritage Council, the Fish and Game Commission, and the Natural Resources Agency.

*Accelerate and Streamline Prevention, Detection and Management of Invasive Species and Pests*

California has an interest in minimizing the threats posed by invasive species and pests. The next phases of a Biodiversity Initiative must expand programs to prevent, detect and manage invasive species and pests; develop California-specific invasive species risks assessments; support and expand early detection programs, and evaluate and improve weed management efforts.

*Evaluate State Protected Areas with Priorities*

A 2015 study published in the Proceedings of the National Academy of Sciences concluded that the protected lands in the United States mismatch biodiversity priorities. This analysis mapped the overlay between species richness, rareness, and conservation priorities against protected landscapes. The Biodiversity Initiative should consider a similar study for California as a means to understand and inform actors, funding, collaborative partnerships, and other actions described. This action will utilize existing information that may already indicate whether protected areas align with biodiversity priorities.

*Evaluate and Improve Mitigation Actions to Better Achieve Conservation Outcomes*

The restoration and protection of lands to achieve biodiversity goals should consider actions already taken in the State. Therefore, a next step action is to develop a comprehensive GIS database of lands that have been protected by mitigation, restored as part of project mitigation, or otherwise subject to investments.

*Evaluate and Capitalize on Opportunities to Utilized Fallowed Agricultural Lands for Pollinator Habitat*

A part of the future for agriculture and conservation in California can be upscaling the use of lands for pollinator habitat. Any evaluation of agricultural lands likely to be fallowed should carefully analyze such lands that provide pollinator habitat, especially for bees. The vision of this work is to create a “pollinator highway” across California for ecosystem services.

#### *Expand Seed Banking and Collection to Create a Hedge Against Extinction*

Expanding seed and germplasm banking is a hedge against permanent loss of native plant biodiversity. California Plant Rescue is a collaborative project involving the Department of Fish and Wildlife, the California Department of Food and Agriculture, the California Native Plant Society, Consortium of California Herbaria, the National Center for Genetic Resources Preservation, and a number of California's arboreta, botanic gardens, universities, and other non-governmental organizations. This network preserves the future of California's native flora by collecting seeds of California species for long-term preservation in secure regional seed banks. In just two years, this program has collected and stored the seeds of over 300 seed accessions of 95 rare plant taxa. A Biodiversity Initiative should advance a statewide seed banking effort to conserve the native plant biodiversity of California and to develop an official California Seed Bank, as a distributed network of currently existing seed banks. This effort could include generating philanthropic support.

#### *AREA 6: Educate Californians About Biodiversity*

Big change requires more than business as usual. Given the challenges facing California's biodiversity, big change is needed. More Californians need to know about biodiversity. Government can help find and teach the next generation of leaders.

#### *Initiate Participatory, Education-Based Actions on the Ground*

The list of these actions could be long. Examples include engaging cities across the state in developing "wildlife garden" efforts with citizens and building a robust network of citizen scientists and conservation professionals to support biodiversity mapping, monitoring and adaptive management. As part of this network, the State can identify a registry of California Conservation Corps programs and partners at the California State University, University of California and other institutions to match students with monitoring and restoration efforts in priority locations. Finally, other ambitious steps could be to institute a statewide environmental awareness requirement at all state-funded universities and colleges, to institute a training program through California colleges and universities that increases the number of undergraduate students currently under-represented in the conservation workforce, and to include concepts of biodiversity in scientific educational standards.

#### *Help People Get Outside to Bring Back Biodiversity*

Each year the State can remind Californians to observe California Biodiversity Day. This biodiversity day should grow to include initiatives that encourage all Californians to get outside and help restore the State's biodiversity through projects like planting the native plant milkweed necessary to support healthy monarch butterfly populations. This could include free access to State parks, free fishing days, and annual days of service.

#### *AREA 7: Prioritize Collaboration and Partnerships*

The potential work under this area is vast. However, the value of collaboration and partnership is very simple to understand. Protecting California's native biodiversity requires cooperation and coordination across public and private landowners, the private sector and citizens.

Ultimately, success depends on including all Californians in the shared effort. Bringing more people into the fold means a greater diversity of ideas and approaches. A greater diversity of ideas and approaches in turn means more Californians will share the economic, environmental, health and personal benefits that California's biodiversity provides.

## Conclusion

This California Biodiversity Initiative – the immediate series of steps we have identified – and the Roadmap represent a first step. Its success will depend on ongoing leadership by the State and collaboration with diverse partners and stakeholders, and support and engagement by all Californians.

In December 2017, a group of 26 scientific experts from across the State's universities, herbaria and conservation organizations drafted and signed an historic "***Charter to Secure the Future of California's Native Biodiversity***." Their short statement describes California's unique role as a biodiversity hotspot, the importance of preserving this status, the challenges to doing so, and identifies key action areas to achieve maintain, restore and preserve the State's biodiversity. This charter document is the inspiration for the principles and actions outlined in this California Biodiversity Initiative and Roadmap. The charter is included as an appendix. We encourage you to read it.



## Appendix: A Charter to Secure the Future of California's Native Biodiversity

### Declaration for Our Future

California is a wondrously diverse and varied state, a global *biodiversity hotspot*. This abundant biological diversity, the measure of a region's genetic, species, and ecosystem diversity, supports our well-being. California's native plants, in particular, enrich our lives and sustain our environment by supporting wildlife, clean air and water, soil retention, and carbon storage, providing a helpful indicator of the health of the State's biodiversity.

California is the nation's can-do state. It is technologically feasible and morally imperative to protect, restore, and conserve California's native plants and animals, and the ecosystems that they support and thrive in for current and future generations. This charter enshrines our commitment to a future that advances long-term economic and environmental gains in harmony with a growing population and the need for resilience in the face of a changing climate.

### California: Home of Innovation, Sanctuary for Biodiversity

California is home to more species of plants and animals than any other state, and is home to about one third of all species found in the United States, including more rare plants than most states have plants. Despite a century and a half of rapid economic and population growth, California has managed to keep nearly all of them. This is because Californians love their common home – ranchers are proud of the sustainable grazing practices, foresters proud of their healthy forests, city dwellers proud of their Griffith, Baldwin, Ballona, Balboa, Presidio, and Bidwell parks. Collectively, we have shown the world that a thriving society can co-exist with great natural richness.

However, we are facing serious challenges and an urgent need for action. Climate change already stresses the State's natural resources. Increasingly frequent, larger, and hotter wildfires are burning our forests and communities, adding carbon to the atmosphere and damaging soil. Drought-stressed trees, in our mountains and in our cities, are succumbing to new diseases and insect pests, eliminating their cooling shade and releasing yet more carbon. Without our action, productive marshes will be flooded by rising seas, historic working landscapes will be lost, and weeds will impair the health of our headwater forests. We must work together swiftly to slow these threats and to save the native plants and animals that undergird California's economic and cultural prosperity.

California is uniquely positioned to respond to these challenges. We have the strongest conservation framework in the nation, supported by public and private partners that are committed to thoughtful, science-based stewardship of the State's natural resources. The State's climate strategy reduces greenhouse-gas emissions and builds resilience for California's people, natural resources, and infrastructure. The State's vision for 2050 commits to recognizing and protecting the values provided by healthy ecosystems and the native plants and animals on which they depend. We have recovered species, from the California condor to a rare mountain mint, from the brink of extinction; restored whole ecosystems after years of damage; and created novel

partnerships to protect plants, animals, and places. Undertaking the challenge of securing our biodiversity and seeing it thrive in the face of change will require the concerted work of many across government, academia, and the private sector, but we build on a strong foundation. This charter establishes common principles and a pathway to bring these groups together to succeed.

### Principles for Action

*Scientific Foundation* – The future we envision requires science-based management and conservation decisions consistent with economic and environmental sustainability for all Californians. Science should be embraced not ignored as a means to help navigate change and uncertainty. This scientific basis must inform decisions at every level from local to state, regional to global.

*Collaboration and Partnership* – Responsibility and opportunity to protect California’s biological diversity cuts across local, state and federal agencies, as well as private landowners and managers. The knowledge and research to guide action lies in academic, government, non-profit and research institutions. This effort must be built on a model of partnership and collaboration.

*Inclusion* - Our cultural diversity, backgrounds, and traditional connections with nature are essential ingredients to form solutions. All Californians benefit from biological diversity, be it a shade tree in an El Segundo playground, resources brought by Sequoia-seeking visitors, the trout stream cooled by wild willows, or the tribe renewing their traditional arts. Threats to native plants and animals affect all, whether urban or rural, wealthy or poor, recent immigrant or indigenous, and all Californians have a right to participate in saving these species, in ways that are meaningful to them. This effort must be built on inclusion of California’s diverse public, communities and perspectives.

### Pathways to Success

This charter calls upon all Californians to work together to secure and recover the abundance and richness of native plants and animals in California, under both current and changing climate conditions. To achieve this goal, we must:

**Understand** the rich natural diversity we have in California, including where it is; what is at risk; what threats the native species and ecosystems of our state face; and what approaches to conservation, restoration, and recovery will be most effective under current and future conditions.

**Protect** California’s native species and ecosystems, securing all of them from decline and extinction, including efforts to continue to exclude invasive plants and pests, especially in light of climate change.

**Recover** imperiled and damaged species and systems, and their ability to provide natural, cultural, and other values throughout their original extents.

**Engage and empower** all Californians in the project of sustaining our common home, with public education, outreach and involvement in citizen science and stewardship. We must harness the genius of our research institutions and technological leadership; build partnerships that embrace tribes, local and traditional knowledge, and our diverse next generation; pursue site-specific conservation actions to save the most sensitive species; forge public-private partnerships; support

working landscapes; and engage all of our citizens.

Undertaking this challenge will require participation by many across government, academia, and the private sector, but California is home to a culture of innovation and creativity, with a tradition of doing and accomplishing great things. Together, we can enable California to continue to be a global leader in the stewardship of natural resources, and put into action a framework to steward our native plants and animals for future generations.

## Founding Signatories

David Ackerly, University of California Berkeley  
Tony Barnosky, Stanford University, Jasper Ridge Preserve  
David Bunn, California Department of Conservation  
Mary Burke, University of California Davis Arboretum and Public Garden  
Dick Cameron, The Nature Conservancy  
Nona Chiariello, Stanford University, Jasper Ridge Preserve  
John Clark, Center for Plant Conservation and San Diego Zoo Global  
Frank Davis, University of California Santa Barbara  
Peggy Fiedler, Natural Reserve System, University of California  
Naomi Fraga, Rancho Santa Ana Botanic Garden  
Dan Gluesenkamp, California Native Plant Society  
Brett Hall, University of California Santa Cruz, Arboretum and Botanic Garden  
Susan Harrison, University of California Davis  
Todd Keeler-Wolf, California Department of Fish and Wildlife  
Dean Kelch, California Department of Food and Agriculture  
Denise Knapp, Santa Barbara Botanic Garden  
Staci Markos, University of California Berkeley, Jepson Herbarium  
Susan Mazer, University of California Santa Barbara  
Lucinda McDade, Rancho Santa Ana Botanic Garden  
Connie Millar, US Forest Service  
Brent Mishler, University of California Berkeley, Jepson Herbarium,  
Jason Sexton, University of California Merced  
Shannon Still, University of California Davis Arboretum  
Jim Thorne, Information Center for the Environment (ICE), UC Davis  
Genevieve Walden, California Department of Food and Agriculture  
Misa Werner, California Energy Commission  
Erika Zavaleta, University of California Santa Cruz

# Executive Department

## State of California

### EXECUTIVE ORDER

**WHEREAS** California is home to more species of plants and animals than any other state in the United States; and

**WHEREAS** the deserts, forests, mountain ranges, valleys, wetlands, woodlands, rivers, estuaries, marine environments, rangelands and agricultural fields of California provide refuge for a vast array of species including approximately 650 species of birds, 220 mammals, 75 amphibians, 70 freshwater fish, over 100 marine fish and mammals and approximately 6,500 native plants – of which 2,000 or more are rare; and

**WHEREAS** the state's plants and animals co-exist to create the complex and beautiful ecosystems upon which so much of California's people and economy depend; and

**WHEREAS** the new reality of climate change requires a more thoughtful and systemic approach that considers the connections and the vast web of relationships that tie together the myriad elements of California's ecosystems; and

**WHEREAS** even after decades of economic and population growth, California has managed to maintain much of its biodiversity; nevertheless, to maintain this biodiversity into the future, the State of California, in partnership with others, must embark upon a far-reaching and synergized set of environmental initiatives; and

**WHEREAS** in December 2017, a group of 26 scientific experts from across the state's universities, herbaria and conservation organizations drafted and signed a historic "*Charter to Secure the Future of California's Native Biodiversity*," and presented it to the State of California, with a call to bold action; and

**WHEREAS** heeding the urgent call from our California scientists to protect biodiversity, I hereby release the first-ever California Biodiversity Initiative.

**NOW, THEREFORE, I, EDMUND G. BROWN JR.**, Governor of the State of California, in accordance with the authority vested in me by the Constitution and statutes of the State of California, do hereby issue the following orders to become effective immediately:

1. The Secretaries of Food and Agriculture and Natural Resources will implement this initiative to achieve the following goals, consistent with the Convention on Biological Diversity: promote deeper understanding of current and future threats to California's biodiversity; protect native vegetation; manage and restore natural and working lands and waterways; and explore appropriate financing options to achieve these goals.
2. All state agencies will work together to achieve the goals of this initiative and embrace appropriate partnerships whenever possible.
3. Finally, from this day forward, September 7th shall be observed as California Biodiversity Day each year.



IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 7<sup>th</sup> day of September 2018.

  
EDMUND G. BROWN JR.  
Governor of California

ATTEST:

\_\_\_\_\_  
ALEX PADILLA  
Secretary of State

# NOAA FISHERIES

National Oceanic and Atmospheric Administration

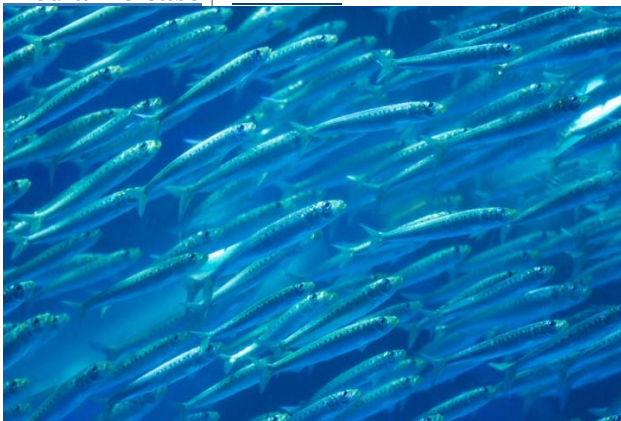
## [NEWS](#)

### **U.S. Secretary of Commerce Declares Commercial Fishery Disasters for West Coast Salmon and Sardines**

*September 25, 2018*

Determinations make these fisheries eligible for NOAA Fisheries fishery disaster assistance.

[Media Release](#) | [National](#)



Today, Secretary of Commerce Wilbur Ross announced that commercial fishery failures occurred between 2015 and 2017 for salmon fisheries in Washington, Oregon, and California, in addition to the sardine fishery in California.

“The Department of Commerce and NOAA stand ready to assist fishing towns and cities along the West Coast as they recover,” said Secretary of Commerce Wilbur Ross. “After years of hardship, the Department looks forward to providing economic relief that will allow the fisheries and the communities they help support to rebound.”

Between July 2016 and March 2018, multiple tribes and governors from Washington, Oregon, and California requested fishery disaster determinations. The Secretary, working with NOAA’s National Marine Fisheries Service (NMFS), evaluated each request based on the available data, and found that all but one (the California red sea urchin fishery) met the requirements for a fishery disaster determination.

The determinations for West Coast salmon and sardines now make these fisheries eligible for NOAA Fisheries fishery disaster assistance. The 2018 Consolidated Appropriations Act provided \$20 million in NOAA Fisheries fishery disaster assistance. The Department of Commerce is determining the appropriate allocations of these funds to eligible fisheries.

*Last updated by [Office of NOAA Public Affairs](#) on September 25, 2018*

**From:** Linda Belton - NOAA Federal [<mailto:linda.belton@noaa.gov>]  
**Sent:** Tuesday, September 25, 2018 11:29 AM  
**Subject:** Fishery Disaster Declarations for California, Washington and Oregon

Good morning:

Today, the Secretary of Commerce has made several positive and one negative determinations of a commercial fishery failure due to a fishery resource disaster under Section 312(a) of the Magnuson-Stevens Fishery Conservation and Management Act. Our [website](#) will be updated as soon as possible and the press release will be issued by the end of today.

Between July 2016 and March 2018, multiple tribes and governors of the States of Washington, Oregon, and California requested fishery disaster determinations.

- 2016 and 2017 ocean troll Klamath River fall Chinook salmon fisheries in Oregon and California
- 2017 Yurok Tribe Klamath River fall Chinook salmon fishery (CA)
- 2016 Makah ocean coho and Chinook salmon troll fishery (WA)
- 2016 and 2017 Hoopa Valley Tribe Klamath River fall Chinook salmon fishery (CA)
- 2015 Hoh Tribe coho salmon fishery (WA)
- 2015 Muckleshoot Tribe Coho and pink salmon fisheries (WA)
- 2015 Suquamish Tribe coho salmon fishery (WA)
- 2015 Nooksack Indian Tribe coho salmon fishery (WA)
- 2015 Stillaguamish Tribe coho salmon fishery (WA)
- 2015 Upper Skagit Indian Tribe coho and pink salmon fisheries (WA)
- 2015 and 2016 Quileute Tribe coho salmon fisheries (WA)
- 2015 and 2016 Pacific sardine fisheries (CA)

The Secretary of Commerce has determined based on available data that a commercial fishery failure due to a fishery disaster did not occur under Section 312 (a) of the Magnuson-Stevens Act for the California red sea urchin fishery.

These positive fishery determinations will be eligible for NMFS fishery disaster assistance. The 2018 Consolidated Appropriations Act (P.L. 115-141) provided \$20 million in NMFS fishery disaster assistance. The Department of Commerce is determining the appropriate allocation of those funds to eligible fisheries.

Please let me know if you have any questions.

--

Linda D. Belton  
Senior Policy Advisor for Intergovernmental Affairs and Tribal Liaison  
NOAA Office of Legislative and Intergovernmental Affairs  
U.S. Department of Commerce  
Washington, DC 20230

**California Fish and Game Commission**  
**Commission Mission and Vision Statements**  
*From 1998 Strategic Plan*

**Mission Statement**

The mission of the California Fish and Game Commission is, on behalf of California citizens, to ensure the long term sustainability of California's fish and wildlife resources by:

- Guiding the ongoing scientific evaluation and assessment of California's fish and wildlife resource
- Setting California's fish and wildlife resource management policies and ensuring these are implemented by DFW
- Establishing appropriate fish and wildlife resource management rules and regulations
- Building active fish and wildlife resource management partnerships with individual landowners, the public and interests groups, and federal, State and local resource management agencies

**Vision Statement**

The vision of the California Fish and Game Commission, in partnership with the Department of Fish and Game and the public, is to assure California has... "Sustainable Fish and Wildlife Resources. "

# California Fish and Game Commission

## Draft Potential Commission Core Values

*September 23, 2018 Draft*

The California Fish and Game Commission (Commission) is considering adopting core values through its strategic planning process. Along with the mission and vision, core values form the foundation for all organizational activities, choices, decisions and actions. Core values are a governance tool that forms a framework for establishing policies, goals, objectives, strategies and procedures. Core values create a statement of priorities for how the Commission and its staff carry out their responsibilities, remaining fixed even as practices change in response to the changing world. Decision-making challenges are most significant at those times when the Commission and its staff must weigh one core value against another.

This document identifies potential core values as discussed during the Commission's August 22 strategic planning agenda item. While there are dozens of core values that could apply to the work of the Commission, there were six distinct "categories" of values identified as important for framing Commission and its staff's work: (1) Integrity, (2) Transparency, (3) Innovation, (4) Collaboration, (5) Excellence and (6) Stewardship.

To help inform the Commission's anticipated decision-making in October 2018 regarding potential core values and the mission and vision statements, it has requested public feedback in advance. **Comments are requested no later than Thursday, October 4, 2018 at [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).**

### Integrity

We hold ourselves to the highest ethical and professional standards, pledging to transparently fulfill our duties and deliver on our commitments, to ensure holistic consistency of expectations and outcomes. We hold ourselves accountable to act in accordance with our values, even when it is difficult. Our actions reflect honesty, truthfulness and accuracy.

### Transparency

We recognize the important and wide-ranging impacts the Commission's decisions have on California's wildlife, wildlife habitat and residents, and that these decisions should be made based on a variety of inputs in an open, inclusive and public process. We strive to communicate with our partners, our stakeholders and the public responsively and openly about how and why decisions are made. We use adaptive processes and consistently gather as much information as possible to ensure the Commission is best informed for thoughtful decision-making.

### Innovation

We respond to the ever-changing natural and human environments by evaluating the efficiency and effectiveness of our decisions and processes, identifying new ideas that challenge conventional wisdom and opportunities for innovation. We recognize that innovation always involves some element of risk, and that creative problem-solving and implementing forward-thinking solutions where value is added is key to meeting the constantly evolving needs of our



stakeholders and California's fish and wildlife. We take time to frame challenges, adapt and execute new and useful ideas, including applying science in new ways.

## **Collaboration**

We value collaboration, including teamwork and partnerships, in problem-solving and in developing policies and regulations. Teamwork is actively fostered and is one of the main ways we function. Collaborative efforts extend beyond the Commission and its staff to empower a diversity of stakeholders, other agencies, non-governmental organizations, and the people of California to participate in our problem-solving and decision-making processes.

We pursue productive and compassionate partnerships, rather than relationships solely based on a formal legal agreement, and celebrate one another's successes as we take them to the next level together. A partnership is a mutually beneficial arrangement that leverages resources to achieve shared goals between the partners, based on mutual respect, open-mindedness, trust, and genuine appreciation of one others' contribution.

## **Excellence**

We pursue quality, proactively assessing performance and striving to continuously improve the delivery of fair and accessible services, work products and decisions, as well as the efficiency and cost-effectiveness with which these are delivered. We encourage novelty, creativity and flexibility as we proactively meet challenges and problem-solve in a constantly-changing world.

## **Stewardship**

We hold the state's wildlife and their habitats in trust for the public, respecting that they have intrinsic value and are essential to the well-being of all California residents. We give attention to the environmental and human stressors that affect the resilience of our wildlife and their habitats. We use credible science to evaluate programs, policies and regulations that will help achieve our stewardship goals. We recognize the dynamic nature of science, and that it should include the evaluation principles of relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation and peer review of information as appropriate.

# California Fish and Game Commission

## Draft Potential Commission Vision Statement

*September 23, 2018 Draft*

The California Fish and Game Commission (Commission) is considering potential changes to its vision statement, which is intended to describe how the future would look if the Commission achieves its mission. As a future-oriented declaration of the Commission's purpose and aspirations, the vision statement complements the mission statement to guide the Commission's work and inform goals and objectives. In short, the vision statement is an effort to bridge the present with the future.

During the Commission's strategic planning effort, discussions have been held within the context of asking what are the Commission's core values, and should the current mission and vision statements change. This document identifies the Commission's current vision statement as well as a suggested vision statement based on comments received to date and commission direction during its August 22-23, 2018 meeting.

To help inform the Commission's anticipated decision-making in October 2018 regarding potential core values and the mission and vision statements, it has requested public feedback in advance. **Comments are requested no later than Thursday, October 4, 2018 at [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).**

### Current Vision Statement

The vision of the Fish and Game Commission, in partnership with the Department of Fish and Wildlife and the public, is to assure California has sustainable fish and wildlife resources.

### Potential Vision Statement

The California Fish and Game Commission envisions creating a platform for transparency and open dialog where information, ideas and facts can be easily available, understood and discussed to support a biodiverse, natural California in which an array of native fish and wildlife thrives within dynamic ecosystems, supports diverse needs and uses, and inspires human interaction and enjoyment.

### Concepts Discussed for a Vision Statement

In considering how the current vision statement might be revised to better reflect a description of the world as it would exist if the Commission were to achieve its grandest aspirations, discussions evolved around six essential questions:

- What is the simple, powerful picture that the mission helps to create?
- What about the outcome is inspiring, engaging and memorable?
- What are the relatable, human, real-world aspects that help create inspiration and engagement?

- Is it possible to quantify the outcome with minimal interpretation?
- Can we think big and compelling without overselling?
- Does the vision align with our values?

Key concepts discussed over time that attempt to address the essential questions included:

- Ecological integrity and resiliency. Dynamic ecosystems that are adaptable to continuous change that is not yet fully understood.
- Endurance. To foster resilient ecosystems and populations. Because we are investing in the persistence of healthy populations, support restoration and enhancement of those populations.
- Abundance in a natural environment. Abundant terrestrial, aquatic and marine wildlife, and the habitats upon which they depend, in a natural state (in other words, not aquariums and zoos).
- Biodiversity. Protecting and conserving a diversity of aquatic and terrestrial wildlife, and their habitats, in California.
- People. Supporting diverse human uses and enjoyment. The Commission represents all Californians and can consider the needs of society and individuals within that broader context.
- Long-term sustainability. Ensuring that the people of California—all Californians—will be able to enjoy our fish and wildlife in perpetuity.
- Intrinsic value. To acknowledge the intrinsic value of wildlife and the habitat upon which it depends.
- Balance. Finding a middle-ground that supports both the living natural systems as well as human access to and use of the resources.
- Decision-making. As an independent decision-making body, to create a platform of transparency and open dialog where information, ideas and facts can be easily available, understood and discussed.
- Inspiration. An environment that inspires the human spirit, to be appreciated and revered.

# California Fish and Game Commission

## Draft Potential Commission Mission Statement

*September 23, 2018 Draft*

The California Fish and Game Commission (Commission) is considering potential changes to its mission statement in the context of thinking about and discussing what the Commission does, why it does what it does and for whom, and how the work of the Commission is different from other organizations. While the Commission's statutory authorities largely dictate the answers to the questions, those authorities do not provide a succinct and defining "story" that describes how the work of the Commission contributes to its vision.

To support the Commission's strategic planning effort, discussions have been held within the context of asking what are the Commission's core values and should the current mission and vision statements change.

This document identifies the Commission's current mission statement, a potential mission statement, and key concepts considered in developing the mission statement.

To help inform the Commission's anticipated decision-making in October 2018 regarding potential core values and the mission and vision statements, it has requested public feedback in advance. **Comments are requested no later than Thursday, October 4, 2018 at [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).**

### Current Mission Statement

"On behalf of California citizens, to ensure the long term sustainability of California's fish and wildlife resources by:

- Guiding the ongoing scientific evaluation and assessment of California's fish and wildlife resources,
- Setting California's fish and wildlife resource management policies and insuring these are implemented by the Department of Fish and Wildlife,
- Establishing appropriate fish and wildlife resource management rules and regulations, and
- Building active fish and wildlife resource management partnerships with individual landowners, the public and interest groups, and federal, state and local resource management agencies."

### Proposed Mission Statement

The California Fish and Game Commission provides leadership to ensure that California will have abundant, healthy, and diverse fish and wildlife, managed with public confidence and participation, through actions that are thoughtful, bold, and visionary in an ever-changing environment.

We recognize our public trust responsibilities as well as the cultural value of our fish and wildlife and, therefore, work collaboratively with other government agencies, non-

governmental organizations and the people of California to establish scientifically-sound policies and regulations that support the restoration, conservation and sustainability of California's fish and wildlife in their natural habitats, securing a rich outdoor heritage for all generations to experience and enjoy.

## **Concepts Considered in Developing the Mission Statement**

In considering how the current mission statement might be revised to better inspire action, staff discussed key concepts that are important to capture in a revised statement. The key concepts are intended to answer four essential questions:

- What does the commission do and why?
- How does the Commission do its work?
- For whom does the Commission do the work?
- What value does the Commission add that makes it unique?

Key concepts that answer the four questions and were considered in developing a revised mission statement include:

- Distinguishing the Commission from other fish and wildlife organizations as a policy- and regulation-setting body that protects and builds upon our conservation heritage.
- Using the Commission's authorities to reach out to other agencies to coordinate approaches and influence long-term ecosystem health.
- As a statewide agency, valuing the relationships we continue to build with our neighbors, partners, stakeholders, other agencies and visitors, and actively engaging the people of California in the work we do every day. Being committed to developing and maintaining strong partnerships with researchers, industry, communities, and other organizations.
- Stewarding California's fish and wildlife resources, shepherding them into the future through today's actions by making decisions that foster resilient and adaptive natural ecosystems which support an abundant, persistent and diverse array of healthy wildlife and their habitats.
- Using a transparent, inclusive, adaptive and precautionary approach that relies upon best readily-available science and public input to support informed and thoughtful decision-making that is responsive but also proactive.
- Creating opportunities for public use and enjoyment now and in perpetuity, which means balancing human benefits and enjoyment with the needs of the natural environment and facilitating public involvement in and appreciation for the natural environment.
- Doing its work for the people of California, the fish and wildlife resources themselves, and non-Californians who benefit from California's fish and wildlife resources.



**California Fish and Game Commission**  
**Public Comments on the Commission's Draft Potential Core Values and Vision and Mission Statements**  
*Comments received by October 5, 2018*

Commenter	Subject	Comment #	Summary of Comment	Proposed Change
<b>Core Values</b>				
Center for Biological Diversity	Core Values - Integrity	1	<p>“to protect and hold California’s fish and wildlife and their greater ecosystems in the public trust”—This addition clarifies what the Commission’s “commitments” are and is consistent with section 710.5 of the Fish and Game Code and common law.</p> <p>“and a commonsense code of ethics”—As values can be subjective, the insertion of a “commonsense code of ethics” helps ensure an objective standard of integrity.</p>	We hold ourselves to the highest ethical and professional standards, pledging to transparently fulfill our duties and deliver on our commitments <u>to protect and hold California’s fish and wildlife and their greater ecosystems in the public trust</u> , to ensure holistic consistency of expectations and outcomes. We hold ourselves accountable to act in accordance with our values <u>and a commonsense code of ethics</u> , even when it is difficult. Our actions reflect honesty, truthfulness, <u>respect</u> and accuracy.
Public Interest Coalition , et al.	Core Values - Integrity	2	We submit that the pledges “to transparently fulfill our duties...” and to responsibly gather information must include full disclosure of any real or potential conflicts of interest. Commissioners or staff that will be voting or creating documents for review, ISOR’s, staff reports and recommendations, etc., may benefit from an action item, or a change in policy, etc.	N/A
Center for Biological Diversity	Core Values - Transparency	3	<p>“that solicits a diverse set of perspectives”—It is important that the core values statement include this addition to explicitly recognize the evolution of interested stakeholders (including consumptive and non-consumptive users) and the Commission’s efforts to engage new perspectives.</p> <p>“We ensure that our choice or order of decision-making made does not unfairly prioritize one interest group over others.”—Because the Commission faces numerous petitions and rulemakings, this addition serves to ensure that the Commission commits not to prioritizing one set of petitions or rulemakings over others given the different interest groups involved.</p>	We recognize the important and wide-ranging impacts the Commission’s decisions have on California’s wildlife, wildlife habitat and residents, and that these decisions should be made based on a variety of inputs in an open, inclusive and public process <u>that solicits a diverse set of perspectives</u> . We strive to communicate with our partners, our stakeholders and the public responsively and openly about how and why decisions are made. <u>We ensure that our choice or order of decision-making made does not unfairly prioritize one interest group over others</u> . We use adaptive processes and consistently gather as much information as possible to ensure the Commission is best informed for thoughtful decision-making.
Public Interest Coalition , et al.	Core Values - Transparency	4	We submit that the pledges “to transparently fulfill our duties...” and to responsibly gather information must include full disclosure of any real or potential conflicts of interest. Commissioners or staff that will be voting or creating documents for review, ISOR’s, staff reports and recommendations, etc., may benefit from an action item, or a change in policy, etc.	N/A
American Sportfishing Association, et al.	Core Values - Transparency	5	We agree with the need to incorporate “the best-available science” as well as other inputs.	We recognize the important and wide-ranging impacts the Commission’s decisions have on California’s wildlife, wildlife habitat and residents, and that these decisions should be made based on <u>the best-available science, as well as a variety of other inputs</u> in an open, inclusive and public process. We strive to communicate with our partners, our stakeholders and the public responsively and openly about how and why decisions are made. We use adaptive processes and consistently gather as much information as possible to ensure the Commission is best informed for thoughtful decision-making.
Center for Biological Diversity	Core Values - Innovation	6	<p>“including climate change, development, and other threats”—As this section deals with “innovation,” it would be remiss if the statement does not explicitly mention climate change, human development, and other threats as actual drivers of our changing environment that demand truly innovative problem-solving and consideration.</p> <p>“best-available science, evolving concepts of wildlife management, and public values toward wildlife in new ways”—The mere application of science alone is not sufficient to guide innovative ideas on wildlife management. This recommended addition articulates the multiple aspects that the Commission should consider when creating innovative solutions:</p> <p>(i) “best- available science” ensures that the Commission take into account the best possible science, fully understanding that there may not exist answers to the exact scientific question at hand;</p> <p>(ii) while science is important, science alone is insufficient for some decisions, so the Commission’s consideration of “evolving concepts of wildlife management” is important to take into account the growing literature in this field; and</p> <p>(iii) “public values toward wildlife” is also essential to the Commission’s innovation in decision-making because it takes into account the diversity of values outside the Commission’s immediate purview.</p>	<p>We respond to the ever-changing natural and human environments, <u>including climate change, development, and other threats</u>, by evaluating the efficiency and effectiveness of our decisions and processes, identifying new ideas that challenge conventional wisdom <u>and historical biases</u>, and opportunities for innovation. We recognize that innovation always involves some element of risk, and that creative problem-solving and implementing forwardthinking solutions where value is added is key to meeting the constantly evolving needs of our stakeholders and California’s fish and wildlife. We take time to frame challenges, adapt and execute new and useful ideas, including applying <u>best-available science, evolving concepts of wildlife management, and public values toward wildlife</u> in new <u>and bold</u> ways.</p>

Commenter	Subject	Comment #	Summary of Comment	Proposed Change
American Sportfishing Association, et al.	Core Values - Collaboration	7	California's sportsmen and women have been the Commission's primary supporters and constituents since its creation nearly 150 years ago. For over 80 years, sportmen and women have played a crucial role in funding conservation efforts and have been the commission's primary supporters and constituents. Hunting and fishing activities provide significant financial support for wildlife conservation, provide an incentive for private landowners to maintain their property as wildlife habitat, and are an important wildlife management tool in many cases. While we recognize that the Commission has a large and growing number of mandates, we also recognize that fish and wildlife conservation as it exists in California would quite simply not be possible without the cooperation, stewardship and funding that comes from the hunting and fishing communities.	<p>We value collaboration, including teamwork and partnerships, in problem-solving and in developing policies and regulations. <u>We understand the important heritage of hunting and angling in California and respect the significant contribution hunters and anglers make in terms of the revenues they contribute, including the on-the-ground partnership they provide to our conservation efforts. Teamwork with this stakeholder community and others is</u> actively fostered and is one of the main ways we function. Collaborative efforts extend beyond the Commission and its staff to empower a diversity of stakeholders, other agencies, non-governmental organizations, and the people of California to participate in our problem-solving and decision- making processes.</p> <p>We pursue productive and compassionate partnerships, rather than relationships solely based on a formal legal agreement and celebrate one another's successes as we take them to the next level together. A partnership is a mutually beneficial arrangement that leverages resources to achieve shared goals between the partners, based on mutual respect, open- mindedness, trust, and genuine appreciation of one others' contribution.</p>
Center for Biological Diversity	Core Values - Collaboration	8	"historical biases"—See comment on Trasnparency for context. Given that the field of wildlife management and the history of the Fish and Game Commission's engagement with the public have been largely dominated by consumptive community members, it is important to recognize the existence of historical biases and understand that innovative solutions need to look beyond them.	<p>Collaboration - We value collaboration, including teamwork and partnerships, in problem-solving and in developing policies and regulations. Teamwork is actively fostered and is one of the main ways we function. Collaborative efforts extend beyond the Commission and its staff to empower a diversity of stakeholders, other agencies, non-governmental organizations, and the people of California to participate in our problem-solving and decision-making processes <u>and, where appropriate, engage in working groups that are fair and balanced.</u> We pursue productive and compassionate partnerships, rather than relationships solely based on a formal legal agreement, and celebrate one another's successes as we take them to the next level together. A partnership is a mutually beneficial arrangement that leverages resources to achieve shared goals between <u>and among</u> the partners, based on mutual respect, openmindedness, trust, and genuine appreciation of one anothers' contribution.</p>
Public Interest Coalition , et al.	Core Values - Collaboration and Excellence	9	<p>Recognition of the “diversity of stakeholders” and “the people of California” being included in the “problem-solving and decision-making processes” is greatly appreciated. This is an area where the desired mutually beneficial arrangement that leverages resources to achieve “shared goals,” and deliver “fair and accessible services....” needs much more scrutiny.</p> <p>Although it may be subtle, we have observed a definite bias rather than shared goals when it comes to “leveraging” the resources. This is apparent in the often- skewed make-up of stakeholder working groups. Consumptives are, or have been, represented in percentages much greater than their numbers would warrant when compared to the State’s non-consumptive population. The inequality seems to ignore the fact that all fish, wildlife, natural resources, etc., belong to all stakeholders; yet non-consumptives are not included in such groups in ratios related to their numbers in California.</p>	N/A
Center for Biological Diversity	Core Values - Stewardship	10	<p>“and, where appropriate, engage in working groups that are fair and balanced”—As we have been a participating stakeholder in the predator policy workgroup, we have been appreciative for that opportunity and see the great value in public working groups that tackle some of our most pressing wildlife issues today. We encourage the continued practice of work groups, and this addition would acknowledge the practice of such work groups as well as the importance that they be fair and balanced in terms of the stakeholder interests involved.</p> <p>“and greater ecosystems”—This addition acknowledges that the health of a species is also dependent on the health and functioning of its underlying ecosystem, which extends beyond a species' immediate habitat and takes into account other management actions that implicate the species.</p> <p>“including climate change, development, and other threats”—See comment on Innovation.</p>	<p>We hold the state's wildlife and their habitats <u>and greater ecosystems</u> in trust for the public, respecting that they have intrinsic value and are essential to the well-being of all California residents. We give attention to the environmental and human stressors, <u>including climate change, development, and other threats,</u> that affect the resilience <u>and health</u> of our wildlife and their habitats <u>and greater ecosystems.</u> We use credible <u>and the best-available</u> science, <u>as well as evolving concepts of wildlife management, and public values toward wildlife,</u> to evaluate programs, policies and regulations that will help achieve our stewardship goals. We recognize the dynamic nature of science, and that it should include the evaluation principles of relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation and peer review of information as appropriate.</p>

Commenter	Subject	Comment #	Summary of Comment	Proposed Change
Project Coyote	Core Values - Stewardship	11	<p>We firmly believe that the preponderance of wildlife policies and procedures have historically been driven by a consumptive-use community comprised of a powerful but small segment of the population. We feel your remit is to be as concerned about the non-game species of our state as about those pursued for recreational purposes.</p> <p>The draft stewardship statement represents an excellent step forward from concepts of the past that emphasized the sustainability of populations for recreational purposes. We are especially encouraged by the use of “intrinsic value” in this statement, and look forward to engaging in a dialogue with you about what this means and its implications. We hope and expect that the statement’s principal objective—to hold wildlife and their habitats in “trust for the public”—extends beyond the traditional concept of the Public Trust Doctrine (PTD) as formulated by some, and encourage you to create further guidance for the public on this. Science and policy belong in related but separate domains. Science may inform policy, but there are dimensions to the latter (e.g., ethical constructs) that lie beyond the reach of science.</p>	“We use credible science <u>and policy</u> to evaluate programs, policies and regulations that will help achieve our stewardship goals.”
American Sportfishing Association, et al.	Core Values - Customer Service (new)	12	California’s sportsmen and women have been the Commission’s primary supporters and constituents since its creation nearly 150 years ago. For over 80 years, sportmen and women have played a crucial role in funding conservation efforts and have been the commission’s primary supporters and constituents. Hunting and fishing activities provide significant financial support for wildlife conservation, provide an incentive for private landowners to maintain their property as wildlife habitat, and are an important wildlife management tool in many cases. While we recognize that the Commission has a large and growing number of mandates, we also recognize that fish and wildlife conservation as it exists in California would quite simply not be possible without the cooperation, stewardship and funding that comes from the hunting and fishing communities.	<p><u>Customer Service</u>  <u>We recognize that in addition to the wildlife and habitats that depend upon our thoughtful management, many Californians rely upon the Commission to efficiently and effectively provide opportunities to pursue time-honored outdoor traditions such as hunting and angling. We are committed to enthusiastically supporting traditional hunting and angling activities, as well as the many Californians who enjoy them.</u></p>
Port of San Diego	Core Values, Mission and Vision Statement	13	<p>Many of the elements proposed are also in alignment with the Port’s values, mission and vision. The Port’s mission is to protect the Tidelands Trust resources by provding economic vitality and community benefit through a balanced approach to the maritime industry, tourism, water and land recreation, environmental stewardship, and public safety. In line with this is a vision to be an innovative global seaport courageously supporting commerce, community and the environment.</p> <p>As it relates to a balance between natural resources and public use, we encourage the commission to include language that embraces our natural resources in a way that allows California to be self-reliant, and not depend on the resources of other nations. This could include providing support for existing, new, and emerging environmental and economically viable opportunities that can take advantage of our vast, renewable resources and assure that California has sustainable fish and wildlife resources for now and into perpetuity.</p>	N/A
<b>Vision Statement</b>				
American Sportfishing Association, et al.	Vision	14	A key concept that needs to be more strongly incorproated into the vision statement is the idea that supporting diverse human uses and enjoyment, includes hunting and angling.	The California Fish and Game Commission envisions creating a platform for transparency and open dialog where information, ideas and facts can be easily available, understood and discussed to support a biodiverse, natural California in which an array of native fish and wildlife thrives within dynamic ecosystems, <u>supports diverse needs and uses, supports angling, hunting, consumptive as well as non-consumptive uses,</u> and inspires human interaction and enjoyment.
Center for Biological Diversity	Vision	15	<p>“public values, best-available science, and law” — In addition to “information, ideas and facts,” public values, best-available science and existing law are also critical components to an open and transparent dialogue before the Commission. “Public values” are especially important to the Fish and Game Commission decisions because they account for the wide range of values that the public holds toward wildlife and transparently acknowledges both consumptive and non- consumptive values held in the state that should be taken into account in these fora.</p> <p>“inform the Commission’s decision-making in support of”—Because this is a vision statement for the Commission, the statement currently lacks the “action” associated with the creation of a transparent and open platform of discussion. This addition serves to apply the creation of that platform to inform the Commission’s decision-making.</p> <p>“values” and “for their intrinsic value”—The addition of “values” to the list of “needs and uses” accounts for the non- consumptive values of wildlife (i.e. intrinsic) and, critically, removes the capitalistic lens that many people have historically had toward wildlife as resources to be exploited. The Fish and Game Commission would be doing a great service in challenging these historical prejudices toward wildlife and emphasizing their intrinsic value as live beings.</p>	<p>The California Fish and Game Commission envisions creating a platform for transparency and open dialogue <u>where information, ideas, and facts, public values, best-available science and law,</u> can be easily available, understood and discussed to <u>inform the Commission’s decision-making in</u> support <u>of</u> a biodiverse, natural California in which an array of native fish and wildlife thrives within dynamic ecosystems, supports diverse needs, <u>values,</u> and uses, and inspires human interaction and enjoyment <u>for their intrinsic value.</u></p>

Commenter	Subject	Comment #	Summary of Comment	Proposed Change
Environmental Protection Information Center (EPIC)	Vision	16	<p>The Public Trust Doctrine, in general, holds that certain lands, waters, and natural resources, such as beaches, navigable rivers, and wildlife, are held by the state in trust for the benefit of the public.</p> <p>The Vision Statement fundamentally changes the Commission's conception of itself from a body that works to maintain the state's wildlife resources into perpetuity—a charge that demands action, through rulemaking, to fulfill—to a body that provides a “platform” to discuss “ideas and facts” which it turn will “support” California's extent biodiversity and diverse needs and uses, and will “inspire human interaction and enjoyment.” The new statement fails to appreciate that the Legislature envisioned a different role for the Commission -- a deliberative body that creates the rules for our human use and interactions with wildlife.</p> <p>The vision and mission statements further depart from the clear intentions and purposes of the Commission set by the Legislature, as provided in the Fish and Game Code, such as Section 2052. A holistic review of the Code confirms the central obligation of the Commission, as phrased in the current Mission Statement.</p> <p>Similar to the proposed mission changes, the draft vision statement adds language that dilutes and weakens the overall vision of the Commission.</p>	<p><del>The California Fish and Game Commission envisions creating a platform for transparency and open dialog where information, ideas and facts can be easily available, understood and discussed to support a biodiverse, natural California in which an array of native fish and wildlife thrives within dynamic ecosystems., supports diverse needs and uses, and inspires human interaction and enjoyment.</del></p>
Project Coyote	Vision	17	<p>Draft vision statement is more inclusive of the needs and interests of the broader California public, and we endorse its intent in that regard. We understand your interest in using the term “native” in this section where it does not appear in the Mission Statement, but hope you will acknowledge the Commission's role and responsibility for proper treatment and respect for all species.</p> <p>As a declaration of the Commission's objectives, we recommend you employ a more active voice here (e.g., rather than say “envisions creating,” consider “will be” or “is”), as well as shorten the statement, perhaps by dropping the text that follows “California.” We feel “biodiverse” will (or should) be understood to include all of the things mentioned thereafter. If this is not the case, we encourage that here and throughout your other drafts you modify the term “fish and wildlife” to “wildlife,” for the reason that wildlife refers to animals collectively.</p>	<p><del>The California Fish and Game Commission envisions creating</del> <u>will be</u> a platform for transparency and open dialog where information, ideas and facts can be easily available, understood and discussed to support a biodiverse, natural California. <del>in which an array of native fish and wildlife thrives within dynamic ecosystems, supports diverse needs and uses, and inspires human interaction and enjoyment.</del></p>
Public Interest Coalition , et al.	Vision	18	<p>We strongly support the Commission's focus on assuring resource sustainability and appreciate its Strategic Plan (SP) Challenges and Goals (December 4, 1998). Because the Mission and Vision Statements are well established and accepted by most, we believe adopted core values must conform to those two foundational statements and the SP policy summaries.</p> <p>Use of the word “needs” in the phrase “...supports diverse needs and uses,” is problematic. It suggests “needs and uses” of humans. Native fish and wildlife should not be perceived as a commodity to “support” any needs or uses of people. It exists for its own sake in a hopefully ecologically balanced system. We urge rewording of that phrase to clarify by incorporating a more defined scope, such as, “...supports diverse ecological functions.”</p>	<p>The California Fish and Game Commission envisions creating a platform for transparency and open dialog where information, ideas and facts can be easily available, understood and discussed to support a biodiverse, natural California in which an array of native fish and wildlife thrives within dynamic ecosystems, supports <del>diverse needs and uses-</del> <u>ecological functions</u>, and inspires human interaction and enjoyment.</p>
<b>Mission Statement</b>				
American Sportfishing Association, et al.	Mission	19	<p>A key concept that needs to be considered in the mission statement is a recognition that the Commission is primarily responsible for regulating the take and possession of fish and wildlife in the state, and that California's sportsmen and women have been the Commission's primary constituency and are vital to wildlife conservation in this state.</p>	<p>The California Fish and Game Commission provides leadership to ensure that California will have abundant, healthy, and diverse fish and wildlife, managed with public confidence and participation, through actions <u>founded on the best-available science</u> that are thoughtful, bold, and visionary in an ever-changing environment.</p> <p>We recognize our public trust responsibilities, <del>as well as the</del> <u>including</u> cultural values of our fish and wildlife and, therefore, work collaboratively with other government agencies, non-governmental organizations and the people of California to establish scientifically-<del>sound-supported</del> <u>sound-supported</u> policies and regulations that support the restoration, conservation, <u>utilization and sustainable</u> <del>use of</del> <u>use</u> of California's fish and wildlife in their natural habitats, securing a rich outdoor heritage of hunting, angling and other recreational <u>consumptive and non-consumptive activities</u> for all generations to experience and enjoy.</p>

Commenter	Subject	Comment #	Summary of Comment	Proposed Change
Bob Bertelli	Mission	20	<p>I am impressed by the word choices in Core Values pertaining to Stewardship. “We use credible science...” and “The dynamic nature of science”. However, In the Potential Mission segment [key concepts considered in developing a revised mission statement], the language is changed to read, “...that relies on the best readily available science...”.</p> <p>"Credible science" sets the bar high enough where the Commission has a resonable expectation of making informed, correct decisions when managing California’s resources. Credible science is rigorous in its methods of investigation, and has withstood equally rigorous inquiry to its validity. Understanding that because of the “Dynamic nature of science” it is Never Settled, but “Credible Science” should take precedent over “best readily available science” which is a lower standard, often being hot off the press, and may not have met proper science rigor.</p>	N/A
Center for Biological Diversity	Mission	21	<p>“has and”—Because this serves as a mission statement, this change ensures that not only the future but also the <i>current</i> state of Commission leadership abides by this mission.</p> <p>“informed”— In addition to the three good adjectives describing Commission actions, the adjective “informed” serves to describe that decisions take into account abundant information including best-available science, policy perspectives, and statements of public values and opinion.</p> <p>“facing climate change, development and other threats”— Given our state’s national leadership on recognizing the grave threats of climate change to the health of California’s species and ecosystems as well as fundamental public health and safety, the Commission’s mission statement would be remiss should it not articulate and acknowledge the existential threats that climate change is wreaking on our wildlife and ecosystems. This type of recognition in the mission statement is important because it acknowledges that such unprecedented threat will indeed require bold and visionary action by the Commission to genuinely protect our wildlife and ecosystems.</p>	<p>The California Fish and Game Commission provides leadership to ensure that California <u>has and</u> will have abundant, healthy, and diverse fish and wildlife, managed with public confidence and participation, through actions that are thoughtful, <u>informed</u>, bold, and visionary in an ever-changing environment <u>facing climate change, development, and other threats</u>.</p>
Center for Biological Diversity	Mission	22	<p>“to hold California’s fish and wildlife and their habitats in the public trust”—This qualifier serves to articulate what “our public trust responsibilities” precisely entail.</p> <p>“intrinsic”— This addition is important because it recognizes another essential value factor, in addition to “cultural,” of the state’s fish and wildlife.</p> <p>“and ecosystems”—This addition acknowledges that the health of a species is also dependent on the health and functioning of its underlying ecosystem, which extends beyond a species’ immediate habitat and takes into account other management actions that implicate the species.</p> <p>“as well as respects public values toward California’s fish and wildlife”—As stewards of the public for the state’s fish and wildlife, it is critical that the Commission adopt in its mission statement an acknowledgment of respecting the California public’s evolving values and perspectives on fish and wildlife. While the Fish and Game Commission has historically interacted with consumptive users of the state’s fish and wildlife, it is important that the views and perspectives of non-consumptive users are acknowledged and taken into account to counter- balance any potential historical biases to ensure fair and informed decision-making by the Commission. The growing presence of the non-consumptive community at Commission meetings is fairly recent in the history of the Commission’s public hearings, and welcoming this type of sea change and democratic participation would serve the Commission well in its mission statement. This addition serves to acknowledge the existence of multiple sets of public values and emphasizes the open-mindedness and respect of these diverse values that should be taken into account in decision-making.</p>	<p>We recognize our public trust responsibilities <u>to hold California’s fish and wildlife and their habitats in the public trust</u>, as well as the cultural <u>and intrinsic</u> value of our fish and wildlife and, therefore, work collaboratively with other government agencies, nongovernmental organizations and the people of California to establish scientifically- sound policies and regulations that support the restoration, conservation and sustainability of California’s fish and wildlife in their natural habitats <u>and ecosystems, as well as respects public values toward California’s fish and wildlife</u>, securing a rich outdoor heritage for all generations to experience and enjoy.</p>
Environmental Protection Information Center (EPIC)	Mission	23	<p>The current Mission Statement is “to <u>ensure</u> the long term sustainability of California’s fish and wildlife resources....” The proposed text changes adds little of value and instead distracts from the Commission’s primary purpose, as set forth by the Legislature and as dictated by the Public Trust Doctrine.</p>	<p>The <del>Mission of the</del> California Fish and Game Commission provides leadership <del>to is to</del>, ensure that California will have abundant, healthy, and diverse fish and wildlife., <del>managed with public confidence and participation, through actions that are thoughtful, bold, and visionary in an ever-changing environment.</del> We recognize our public trust responsibilities as well as the cultural value of our fish and wildlife and, therefore, work collaboratively with other government agencies, <u>tribes</u>, non-governmental organizations and the people of California to establish scientifically-sound policies and regulations <del>that support to</del> <u>protect, enhance and restore</u> California’s <del>native</del> fish and wildlife in their natural habitats, <del>-to <u>securing</u></del> a rich outdoor heritage for all generations to experience and enjoy.</p>



Commenter	Subject	Comment #	Summary of Comment	Proposed Change
Project Coyote	Mission	24	The proposed Mission Statement, again, improves and expands on the old statement to better reflect current times and interests. We offer no substantive changes excepting the above-mentioned change in “fish and wildlife,” see note 36 above.	N/A
Public Interest Coalition , et al.	Mission	25	<p>The statement, “...establish scientifically-sound policies and regulations that support the restoration, conservation and sustainability of California’s fish and wildlife in their natural habitats,” is appropriate. However, we urge a revision at the end of that sentence (“...securing a rich outdoor heritage for all generations to experience and enjoy”). Please consider changing the word “enjoy” to “respect.” As currently worded, its meaning could be interpreted that fish and wildlife exist for human enjoyment, when human benefit should considered secondary.</p> <p>This perception or concern is reinforced in the “Concepts Considered...” (page 2 of the Mission Statement, second to last bulleted paragraph) with the word, “Creating opportunities for public use and enjoyment....” Balancing human benefits may sound reasonable, but we urge that the needs of the natural environment take top priority over any human benefits or enjoyment and be stated as such.</p>	<p>The California Fish and Game Commission provides leadership to ensure that California will have abundant, healthy, and diverse fish and wildlife, managed with public confidence and participation, through actions that are thoughtful, bold, and visionary in an ever-changing environment.</p> <p>We recognize our public trust responsibilities as well as the cultural value of our fish and wildlife and, therefore, work collaboratively with other government agencies, non-governmental organizations and the people of California to establish scientifically-sound policies and regulations that support the restoration, conservation and sustainability of California's fish and wildlife in their natural habitats, securing a rich outdoor heritage for all generations to experience and <del>enjoy</del> respect.</p>



October 4, 2018

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 1416 Ninth Street, Suite 1320  
 Sacramento, CA 95814

Dear President Sklar and Commissioners:

California's sportsmen and women have been the Commission's primary supporters and constituents since the Commission's creation nearly 150 years ago. The Commission has been a faithful steward of our wildlife resources, and our organizations have been proud partners in that endeavor. It is for that reason that we were both surprised and disappointed to find that the core values and revised vision and mission statement currently being considered by the Commission contains no reference to the hunting or fishing traditions that have defined the Commission's mission for over a century.

For over 80 years, sportsmen and women have played a crucial role in funding conservation efforts throughout the United States through the American System of Conservation Funding (ASCF). The American System is a "user-pays, public-benefits" structure, unique to the rest of the world, in which those that consumptively use public resources pay for the privilege, and in some cases have the right, to do so. This funding system has allowed the North American Model of Wildlife Conservation to become recognized as the most successful conservation framework in history. As America's original conservationists, sportsmen and sportswomen have a long and proud tradition of serving as stewards of our wildlife and natural land.

Nowhere is this truer than California. No other constituency contributes more money to the Department of Fish and Wildlife – and by extension the Commission – than sportsmen and

women. In 2017 alone, hunting and fishing license sales, in addition to monies generated through the Pittman-Robertson and Dingell-Johnson Acts was responsible for over \$125 million dollars in revenue to the Department. Hunting and fishing are an important part of California's heritage – so much so that Californians have enshrined the right to fish in our Constitution.

Regarding the Commission's September 23, 2018 draft core values and vision and mission statement, we believe these documents should include explicit support of hunting and fishing activities, as these are the traditional uses of wildlife regulated by the Commission. Additionally, these activities provide significant financial support for wildlife conservation, provide an incentive for private landowners to maintain their property as wildlife habitat, and are an important wildlife management tool in many cases. While we recognize that the Commission has a large and growing number of mandates, we also recognize that fish and wildlife conservation as it exists in California today would quite simply not be possible without the cooperation, stewardship, and funding that comes from the hunting and fishing community, and it is our strong feeling that this should be reflected in the Commission's strategic plan. To that end, we have attached some suggested language that we would like to see included in your final strategic planning documents.

The hunting and fishing communities have long enjoyed a unique and productive relationship with the Fish and Game Commission. As the Commission looks forward to its next chapter, we are eager to maintain and build upon that relationship, and are grateful for your consideration of our concerns.

Sincerely,

American Sportfishing Association  
Black Brant Group  
CAL-ORE Wetlands and Waterfowl Association  
California Bowmen Hunters  
California Deer Association  
California Houndsmen for Conservation  
California Rifle and Pistol Association  
California Sportfishing League  
California Waterfowl Association  
Coastside Fishing Club  
Congressional Sportsmen's Foundation  
The Grassland Fund  
National Open Field Coursing Association  
National Wildlife Turkey Federation - California Chapter  
Northern California Guides & Sportsmen's Association  
Rocky Mountain Elk Foundation  
Safari Club International - San Francisco Bay Area Chapter  
San Diego County Wildlife Federation  
Suisun Resource Conservation District  
Tulare Basin Wetlands Association  
Wild Sheep Foundation - California Chapter

# California Fish and Game Commission

## Recommended Commission Core Values

*October 4, 2018*

The California Fish and Game Commission (Commission) is considering adopting core values through its strategic planning process. Along with the mission and vision, core values form the foundation for all organizational activities, choices, decisions and actions. Core values are a governance tool that forms a framework for establishing policies, goals, objectives, strategies and procedures. Core values create a statement of priorities for how the Commission and its staff carry out their responsibilities, remaining fixed even as practices change in response to the changing world. Decision-making challenges are most significant at those times when the Commission and its staff must weigh one core value against another.

This document identifies potential core values as discussed during the Commission's August 22 strategic planning agenda item. While there are dozens of core values that could apply to the work of the Commission, there were six distinct "categories" of values identified as important for framing Commission and its staff's work: (1) Integrity, (2) Transparency, (3) Innovation, (4) Collaboration, (5) Excellence and (6) Stewardship.

To help inform the Commission's anticipated decision-making in October 2018 regarding potential core values and the mission and vision statements, it has requested public feedback in advance. **Comments are requested no later than Thursday, October 4, 2018 at [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).**

### Integrity

We hold ourselves to the highest ethical and professional standards, pledging to transparently fulfill our duties and deliver on our commitments, to ensure holistic consistency of expectations and outcomes. We hold ourselves accountable to act in accordance with our values, even when it is difficult. Our actions reflect honesty, truthfulness and accuracy.

### Transparency

We recognize the important and wide-ranging impacts the Commission's decisions have on California's wildlife, wildlife habitat and residents, and that these decisions should be made based on the best-available science, as well as a variety of other inputs in an open, inclusive and public process. We strive to communicate with our partners, our stakeholders and the public responsively and openly about how and why decisions are made. We use adaptive processes and consistently gather as much information as possible to ensure the Commission is best informed for thoughtful decision-making.

### Innovation

We respond to the ever-changing natural and human environments by evaluating the efficiency and effectiveness of our decisions and processes, identifying new ideas that challenge conventional wisdom and opportunities for innovation. We recognize that innovation always involves some element of risk, and that creative problem-solving and implementing forward-thinking solutions where value is added is key to meeting the constantly evolving needs of our

stakeholders and California's fish and wildlife. We take time to frame challenges, adapt and execute new and useful ideas, including applying science in new ways.

## **Collaboration**

We value collaboration, including teamwork and partnerships, in problem-solving and in developing policies and regulations. We understand the important heritage of hunting and angling in California and respect the significant contribution hunters and anglers make in terms of the revenues they contribute, including the on-the-ground partnership they provide to our conservation efforts. Teamwork with this stakeholder community and others is actively fostered and is one of the main ways we function. Collaborative efforts extend beyond the Commission and its staff to empower a diversity of stakeholders, other agencies, non-governmental organizations, and the people of California to participate in our problem-solving and decision-making processes.

We pursue productive and compassionate partnerships, rather than relationships solely based on a formal legal agreement and celebrate one another's successes as we take them to the next level together. A partnership is a mutually beneficial arrangement that leverages resources to achieve shared goals between the partners, based on mutual respect, open-mindedness, trust, and genuine appreciation of one others' contribution.

## **Excellence**

We pursue quality, proactively assessing performance and striving to continuously improve the delivery of fair and accessible services, work products and decisions, as well as the efficiency and cost-effectiveness with which these are delivered. We encourage novelty, creativity and flexibility as we proactively meet challenges and problem-solve in a constantly-changing world.

## **Stewardship**

We hold the state's wildlife and their habitats in trust for the public, respecting that they have intrinsic value and are essential to the well-being of all California residents. We give attention to the environmental and human stressors that affect the resilience of our wildlife and their habitats. We use credible science to evaluate programs, policies and regulations that will help achieve our stewardship goals. We recognize the dynamic nature of science, and that it should include the evaluation principles of relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation and peer review of information as appropriate.

## **Customer Service**

We recognize that in addition to the wildlife and habitats that depend upon our thoughtful management, many Californians rely upon the Commission to efficiently and effectively provide opportunities to pursue time-honored outdoor traditions such as hunting and angling. We are committed to enthusiastically supporting traditional hunting and angling activities, as well as the many Californians who enjoy them.



# California Fish and Game Commission

## Recommended Commission Vision Statement

*October 4, 2018*

The California Fish and Game Commission (Commission) is considering potential changes to its vision statement, which is intended to describe how the future would look if the Commission achieves its mission. As a future-oriented declaration of the Commission's purpose and aspirations, the vision statement complements the mission statement to guide the Commission's work and inform goals and objectives. In short, the vision statement is an effort to bridge the present with the future.

During the Commission's strategic planning effort, discussions have been held within the context of asking what are the Commission's core values, and should the current mission and vision statements change. This document identifies the Commission's current vision statement as well as a suggested vision statement based on comments received to date and commission direction during its August 22-23, 2018 meeting.

To help inform the Commission's anticipated decision-making in October 2018 regarding potential core values and the mission and vision statements, it has requested public feedback in advance. **Comments are requested no later than Thursday, October 4, 2018 at [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).**

### Current Vision Statement

The vision of the Fish and Game Commission, in partnership with the Department of Fish and Wildlife and the public, is to assure California has sustainable fish and wildlife resources.

### Potential Vision Statement

The California Fish and Game Commission envisions creating a platform for transparency and open dialog where information, ideas and facts can be easily available, understood and discussed to support a biodiverse, natural California in which an array of native fish and wildlife thrives within dynamic ecosystems, supports diverse needs and uses, supports angling, hunting, consumptive as well as non-consumptive uses, and inspires human interaction and enjoyment.

### Concepts Discussed for a Vision Statement

In considering how the current vision statement might be revised to better reflect a description of the world as it would exist if the Commission were to achieve its grandest aspirations, discussions evolved around six essential questions:

- What is the simple, powerful picture that the mission helps to create?
- What about the outcome is inspiring, engaging and memorable?
- What are the relatable, human, real-world aspects that help create inspiration and engagement?

- Is it possible to quantify the outcome with minimal interpretation?
- Can we think big and compelling without overselling?
- Does the vision align with our values?

Key concepts discussed over time that attempt to address the essential questions included:

- Ecological integrity and resiliency. Dynamic ecosystems that are adaptable to continuous change that is not yet fully understood.
- Endurance. To foster resilient ecosystems and populations. Because we are investing in the persistence of healthy populations, support restoration and enhancement of those populations.
- Abundance in a natural environment. Abundant terrestrial, aquatic and marine wildlife, and the habitats upon which they depend, in a natural state (in other words, not aquariums and zoos).
- Biodiversity. Protecting and conserving a diversity of aquatic and terrestrial wildlife, and their habitats, in California.
- People. Supporting diverse human uses and enjoyment, including hunting and angling. The Commission represents all Californians and can consider the needs of society and individuals within that broader context.
- Long-term sustainability. Ensuring that the people of California—all Californians—will be able to enjoy our fish and wildlife in perpetuity.
- Intrinsic value. To acknowledge the intrinsic value of wildlife and the habitat upon which it depends.
- Balance. Finding a middle-ground that supports both the living natural systems as well as human access to and use of the resources.
- Decision-making. As an independent decision-making body, to create a platform of transparency and open dialog where information, ideas and facts can be easily available, understood and discussed.
- Inspiration. An environment that inspires the human spirit, to be appreciated and revered.

# California Fish and Game Commission

## Recommended Commission Mission Statement

October 4, 2018

The California Fish and Game Commission (Commission) is considering potential changes to its mission statement in the context of thinking about and discussing what the Commission does, why it does what it does and for whom, and how the work of the Commission is different from other organizations. While the Commission's statutory authorities largely dictate the answers to the questions, those authorities do not provide a succinct and defining "story" that describes how the work of the Commission contributes to its vision.

To support the Commission's strategic planning effort, discussions have been held within the context of asking what are the Commission's core values and should the current mission and vision statements change.

This document identifies the Commission's current mission statement, a potential mission statement, and key concepts considered in developing the mission statement.

To help inform the Commission's anticipated decision-making in October 2018 regarding potential core values and the mission and vision statements, it has requested public feedback in advance. **Comments are requested no later than Thursday, October 4, 2018 at [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).**

### Current Mission Statement

"On behalf of California citizens, to ensure the long term sustainability of California's fish and wildlife resources by:

- Guiding the ongoing scientific evaluation and assessment of California's fish and wildlife resources,
- Setting California's fish and wildlife resource management policies and insuring these are implemented by the Department of Fish and Wildlife,
- Establishing appropriate fish and wildlife resource management rules and regulations, and
- Building active fish and wildlife resource management partnerships with individual landowners, the public and interest groups, and federal, state and local resource management agencies."

### Proposed Mission Statement

The California Fish and Game Commission provides leadership to ensure that California will have abundant, healthy, and diverse fish and wildlife, managed with public confidence and participation, through actions founded on the best-available science that are thoughtful, bold, and visionary in an ever-changing environment.

We recognize our public trust responsibilities as well as the including cultural values of our fish and wildlife and, therefore, work collaboratively with other government

agencies, non-governmental organizations and the people of California to establish scientifically sound supported policies and regulations that support ~~the~~ restoration, conservation, utilization and sustainable life use of California's fish and wildlife in their natural habitats, securing a rich outdoor heritage of hunting, angling and other recreational consumptive and non-consumptive activities for all generations to experience and enjoy.

## Concepts Considered in Developing the Mission Statement

In considering how the current mission statement might be revised to better inspire action, staff discussed key concepts that are important to capture in a revised statement. The key concepts are intended to answer four essential questions:

- What does the commission do and why?
- How does the Commission do its work?
- For whom does the Commission do the work?
- What value does the Commission add that makes it unique?

Key concepts that answer the four questions and were considered in developing a revised mission statement include:

- Distinguishing the Commission from other fish and wildlife organizations as a policy- and regulation-setting body that protects and builds upon our conservation heritage.
- Using the Commission's authorities to reach out to other agencies to coordinate approaches and influence long-term ecosystem health.
- As a statewide agency, valuing the relationships we continue to build with our neighbors, partners, stakeholders, other agencies and visitors, and actively engaging the people of California in the work we do every day. Being committed to developing and maintaining strong partnerships with researchers, industry, communities, and other organizations.
- Stewarding California's fish and wildlife resources, shepherding them into the future through today's actions by making decisions that foster resilient and adaptive natural ecosystems which support an abundant, persistent and diverse array of healthy wildlife and their habitats.
- Recognizing that the Commission is primarily responsible for regulating the take and possession of fish and wildlife in the state, and that California's sportsmen and women are our primary constituency and are vital to wildlife conservation in this state.
- Using a transparent, inclusive, adaptive and precautionary approach that relies upon best readily-available science and public input to support informed and thoughtful decision-making that is responsive but also proactive.
- Creating opportunities for public use and enjoyment now and in perpetuity, which means balancing human benefits and enjoyment with the needs of the natural

environment and facilitating public involvement in and appreciation for the natural environment.

- Doing its work for the people of California, the fish and wildlife resources themselves, and non-Californians who benefit from California's fish and wildlife resources.

DRAFT



# PROJECT COYOTE

FOSTERING COEXISTENCE



October 2, 2018

California Fish and Game Commission ("the Commission")

President Eric Sklar

Vice President Anthony Williams

Commissioner Jacque Hostler-Carmesin

Commissioner Russell Burns

Commissioner Peter Silva

Commission Executive Director Valerie Termini

*Sent via email (fgc@fgc.ca.gov)*

**Re: Draft "Core Values," "Stewardship," "Vision," and "Mission" statements for the California Fish and Game Commission**

Dear President Sklar, Vice President Williams, Commissioners, and Executive Director Termini,

We write on behalf of Project Coyote to thank you for the opportunity to comment on the draft "Core Values," "Stewardship," "Vision," and "Mission" statements created by the California Fish and Game Commission (Commission) through your strategic planning process. Project Coyote is a national non-profit organization based in Northern California whose mission is to promote compassionate conservation and coexistence between people and wildlife through education, science, and advocacy. We are deeply vested in the protection and conservation of California's wildlife, as well as in representing the many Californians who appreciate, enjoy, and benefit from wildlife and an association with the natural environment.

To preface our comments we will mention, but not belabor, the issue of asymmetry in wildlife protection and conservation in the United States. We firmly believe that the preponderance of wildlife policies and procedures have historically been driven by a consumptive-use community comprised of a powerful but small segment of the population. This is changing as the public majority has increasingly become involved in the protection and conservation of not only wild animals themselves, but the biological and ecological communities of which they are a part. We feel your remit is to be as concerned about the non-game species of our state as about those pursued for recreational purposes—which we hope is your position as well. We are fully aware of the fiscal, administrative, and logistical challenges you face with an expanded portfolio, and stand ready to support your efforts for continuing legislative reform to rebalance as necessary to meet future needs. Our specific comments and suggestions follow.

# PROJECT COYOTE

F O S T E R I N G   C O E X I S T E N C E



## Core values

We applaud the Commission for proposing to adopt a set of core values. It is important and appropriate that these values reflect the views of all Californians, and your internal standards indicate that your processes will strive to do so. We recommend as a future step that you follow your statements with action items that elaborate on how your core values will be accountably fulfilled. For example, under “Collaboration” you mention the effort you will commit to “empower” a diversity of stakeholders. A logical next step would be to articulate the processes through which you intend to do so.

## Stewardship

The draft stewardship statement represents an excellent step forward from concepts of the past that emphasized the sustainability of populations for recreational purposes. We are especially encouraged by the use of “intrinsic value” in this statement, and look forward to engaging in a dialogue with you about what this means and its implications. We hope and expect that the statement’s principal objective—to hold wildlife and their habitats in “trust for the public”—extends beyond the traditional concept of the Public Trust Doctrine (PTD) as formulated by some, and encourage you to create further guidance for the public on this. We suggest revising the sentence “We use credible science to evaluate programs, policies and regulations that will help achieve our stewardship goals” to read “We will use credible science *and policy* to evaluate programs and regulations that will help achieve our stewardship goals,” as we feel that science and policy belong in related but separate domains. Science may inform policy, but there are dimensions to the latter (e.g., ethical constructs) that lie beyond the reach of science.

## Vision Statement

As with other proposed changes, the draft vision statement is more inclusive of the needs and interests of the broader California public, and we endorse its intent in that regard. As a declaration of the Commission’s objectives, we recommend you employ a more active voice here (e.g., rather than say “envisions creating,” consider “will be” or “is”), as well as shorten the statement, perhaps by dropping the text that follows “California.” We feel “biodiverse” will (or should) be understood to include all of the things mentioned thereafter. If this is not the case, we encourage that here and throughout your other drafts you modify the term “fish and wildlife” to “wildlife,” for the reason that wildlife refers to animals collectively. We understand your interest in using the term “native” in this section where it does not appear in the Mission Statement, but hope you will acknowledge the Commission’s role and responsibility for proper treatment and respect for all species.

# PROJECT COYOTE

FOSTERING COEXISTENCE



## Mission Statement

The proposed Mission Statement, again, improves and expands on the old statement to better reflect current times and interests. We offer no substantive changes excepting the above-mentioned change in “fish and wildlife.”

In closing, we thank you for this opportunity to comment on behalf of our organization and its members. This is a positive step toward greater inclusiveness and recognition of all the varied communities of interest who care about our state’s wildlife. We are keen on providing whatever future input will be productive in expanding and improving the important work you do on behalf of the citizens of this state.

Respectfully submitted,

Camilla H. Fox  
Project Coyote Founder & Executive Director

John Hadidian, PhD  
Project Coyote Science Advisory Board



*Sent via electronic mail*

October 4, 2018

California Fish and Game Commission (“the Commission”)  
Executive Director Valerie Termini  
President Eric Sklar  
Vice President Jacqueline Hostler-Carmesin  
Commissioner Russell Burns  
Commissioner Peter Silva  
Commissioner Anthony Williams

1416 Ninth Street, Room 1320  
Sacramento, CA 95814  
Fax: (916) 653-5040  
[fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)

**Re: Center for Biological Diversity’s Comments on California Fish and Game Commission’s Core Values, Vision, and Mission Statements (September 23, 2018 draft)**

Dear President Sklar, Vice President Hostler-Carmesin, and Commissioners Burns, Silva, and Williams, and Executive Director Termini:

On behalf of the Center for Biological Diversity (“the Center”) and our over 100,000 members and supporters in California, we applaud your efforts to craft a core values statement and to revise the current mission and vision statements for the Fish and Game Commission (“the Commission”). We thank you for the opportunity to provide public comments on the September 23, 2018 drafts of these statements and look forward to your consideration of the comments below, as well as further dialogue and discussion where relevant, when adapting these statements in the near future.

## **I. CORE VALUES STATEMENT**

Our suggested revisions to the “Core Values Statement” are:

### **Integrity**

We hold ourselves to the highest ethical and professional standards, pledging to transparently fulfill our duties and deliver on our commitments to protect and hold California’s fish and wildlife and their greater ecosystems in the public trust<sup>1</sup>, to ensure holistic consistency of expectations and outcomes. We hold ourselves accountable to act in accordance with our values and a commonsense code of ethics<sup>2</sup>, even when it is difficult. Our actions reflect honesty, truthfulness, respect and accuracy.

### **Transparency**

We recognize the important and wide-ranging impacts the Commission's decisions have on California's wildlife, wildlife habitat and residents, and that these decisions should be made based on a variety of inputs in an open, inclusive and public process [that solicits a diverse set of perspectives](#).<sup>3</sup> We strive to communicate with our partners, our stakeholders and the public responsively and openly about how and why decisions are made. [We ensure that our choice or order of decision-making made does not unfairly prioritize one interest group over others](#).<sup>4</sup> We use adaptive processes and consistently gather as much information as possible to ensure the Commission is best informed for thoughtful decision-making.

### **Innovation**

[We respond to the ever-changing natural and human environments, including climate change, development, and other threats](#),<sup>4</sup> by evaluating the efficiency and effectiveness of our decisions and processes, identifying new ideas that challenge conventional wisdom and [historical biases](#)<sup>5</sup>, and opportunities for innovation. We recognize that innovation always involves some element of risk, and that creative problem-solving and implementing forwardthinking solutions where value is added is key to meeting the constantly evolving needs of our stakeholders and California's fish and wildlife. We take time to frame challenges, adapt and execute new and useful ideas, including applying [best-available](#) science, [evolving concepts of wildlife management, and public values toward wildlife](#)<sup>6</sup> in new [and bold](#) ways.

### **Collaboration**

We value collaboration, including teamwork and partnerships, in problem-solving and in developing policies and regulations. Teamwork is actively fostered and is one of the main ways we function. Collaborative efforts extend beyond the Commission and its staff to empower a diversity of stakeholders, other agencies, non-governmental organizations, and the people of California to participate in our problem-solving and decision-making processes [and, where appropriate, engage in working groups that are fair and balanced](#).<sup>7</sup>

We pursue productive and compassionate partnerships, rather than relationships solely based on a formal legal agreement, and celebrate one another's successes as we take them to the next level together. A partnership is a mutually beneficial arrangement that leverages resources to achieve shared goals between [and among](#) the partners, based on mutual respect, openmindedness, trust, and genuine appreciation of one [an](#)others' contribution.

### **Excellence**

We pursue quality, proactively assessing performance and striving to continuously improve the delivery of fair and accessible services, work products and decisions, as well as the efficiency and cost-effectiveness with which these are delivered. We encourage novelty, creativity and flexibility as we proactively meet challenges and problem-solve in a constantly-changing world.

### **Stewardship**



We hold the state's wildlife and their habitats [and greater ecosystems](#)<sup>8</sup> in trust for the public, respecting that they have intrinsic value and are essential to the well-being of all California residents. We give attention to the environmental and human stressors, [including climate change, development, and other threats](#)<sup>9</sup>, that affect the resilience [and health](#) of our wildlife and their habitats [and greater ecosystems](#). We use credible [and the best-available](#) science, [as well as evolving concepts of wildlife management, and public values toward wildlife](#),<sup>10</sup> to evaluate programs, policies and regulations that will help achieve our stewardship goals. We recognize the dynamic nature of science, and that it should include the evaluation principles of relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation and peer review of information as appropriate.

The reasoning for these changes is as follows:

1. **“to protect and hold California’s fish and wildlife and their greater ecosystems in the public trust”**—This addition clarifies what the Commission’s “commitments” are and is consistent with section 710.5 of the Fish and Game Code and common law.
2. **“and a commonsense code of ethics”**—As values can be subjective, the insertion of a “commonsense code of ethics” helps ensure an objective standard of integrity.
3. **“that solicits a diverse set of perspectives”**—One of the most remarkable and inspiring developments regarding the Fish and Game Commission’s public processes is the ever-increasing participation from non-consumptive communities of wildlife. While the Commission has historically worked closely with consumptive wildlife communities, the last few years in particular have witnessed a growing participation of non-consumptive communities who may not have been aware of the Commission’s scope of decision-making before. In light of this sea-change and positive shift in democratic participation, it is important that the core values statement include this addition to explicitly recognize the evolution of interested stakeholders and the Commission’s efforts to engage new perspectives.
4. **“including climate change, development, and other threats”**—As this section deals with “innovation,” it would be remiss if the statement does not explicitly mention climate change, human development, and other threats as actual drivers of our changing environment that demand truly innovative problem-solving and consideration.
5. **“We ensure that our choice or order of decision-making made does not unfairly prioritize one interest group over others.”**—Because the Commission faces numerous petitions and rulemakings, this addition serves to ensure that the Commission commits not to prioritizing one set of petitions or rulemakings over others given the different interest groups involved.
6. **“best-available science, evolving concepts of wildlife management, and public values toward wildlife in new ways”**—The mere application of science alone is not sufficient to guide innovative ideas on wildlife management. This recommended addition articulates the multiple aspects that the Commission should consider when creating innovative solutions: (i) “best-available science” ensures that the Commission take into account the best possible science, fully understanding that there may not exist answers to the exact scientific question at hand; (ii) while science is important, science alone is insufficient for some decisions, so the Commission’s consideration of “evolving concepts of wildlife management” is important to take into account

the growing literature in this field; and (iii) “public values toward wildlife” is also essential to the Commission’s innovation in decision-making because it takes into account the diversity of values outside the Commission’s immediate purview.

7. **“historical biases”**—See note 3 above for context. Given that the field of wildlife management and the history of the Fish and Game Commission’s engagement with the public have been largely dominated by consumptive community members, it is important to recognize the existence of historical biases and understand that innovative solutions need to look beyond them.
8. **“and, where appropriate, engage in working groups that are fair and balanced”**—As we have been a participating stakeholder in the predator policy workgroup, we have been appreciative for that opportunity and see the great value in public working groups that tackle some of our most pressing wildlife issues today. We encourage the continued practice of work groups, and this addition would acknowledge the practice of such work groups as well as the importance that they be fair and balanced in terms of the stakeholder interests involved.
9. **“and greater ecosystems”**—This addition acknowledges that the health of a species is also dependent on the health and functioning of its underlying ecosystem, which extends beyond a species’ immediate habitat and takes into account other management actions that implicate the species.
10. **“including climate change, development, and other threats”**—See note 3 above.
11. **“and the best-available science, as well as evolving concepts of wildlife management, and public values toward wildlife”** —See note 4 above.

## II. MISSION STATEMENT

Our suggested revisions to the “Proposed Mission Statement” are:

The California Fish and Game Commission provides leadership to ensure that California has and<sup>1</sup> will have abundant, healthy, and diverse fish and wildlife, managed with public confidence and participation, through actions that are thoughtful, informed,<sup>2</sup> bold, and visionary in an ever-changing environment facing climate change, development, and other threats<sup>3</sup>.

We recognize our public trust responsibilities to hold California’s fish and wildlife and their habitats in the public trust<sup>4</sup>, as well as the cultural and intrinsic<sup>5</sup> value of our fish and wildlife and, therefore, work collaboratively with other government agencies, nongovernmental organizations and the people of California to establish scientifically-sound policies and regulations that support the restoration, conservation and sustainability of California’s fish and wildlife in their natural habitats and ecosystems<sup>6</sup>, as well as respects public values toward California’s fish and wildlife<sup>7</sup>, securing a rich outdoor heritage for all generations to experience and enjoy.

The reasoning for these changes is as follows:

12. **“has and”**—Because this serves as a mission statement, this change ensures that not only the future but also the *current* state of Commission leadership abides by this mission.

13. **“informed”**— In addition to the three good adjectives describing Commission actions, the adjective “informed” serves to describe that decisions take into account abundant information including best-available science, policy perspectives, and statements of public values and opinion.
14. **“facing climate change, development and other threats”**— Given our state’s national leadership on recognizing the grave threats of climate change to the health of California’s species and ecosystems as well as fundamental public health and safety, the Commission’s mission statement would be remiss should it not articulate and acknowledge the existential threats that climate change is wreaking on our wildlife and ecosystems. This type of recognition in the mission statement is important because it acknowledges that such unprecedented threat will indeed require bold and visionary action by the Commission to genuinely protect our wildlife and ecosystems.
15. **“to hold California’s fish and wildlife and their habitats in the public trust”**—This qualifier serves to articulate what “our public trust responsibilities” precisely entail.
16. **“intrinsic”**— This addition is important because it recognizes another essential value factor, in addition to “cultural,” of the state’s fish and wildlife.
17. **“and ecosystems”**—This addition acknowledges that the health of a species is also dependent on the health and functioning of its underlying ecosystem, which extends beyond a species’ immediate habitat and takes into account other management actions that implicate the species.
18. **“as well as respects public values toward California’s fish and wildlife”**—As stewards of the public for the state’s fish and wildlife, it is critical that the Commission adopt in its mission statement an acknowledgment of respecting the California public’s evolving values and perspectives on fish and wildlife. While the Fish and Game Commission has historically interacted with consumptive users of the state’s fish and wildlife, it is important that the views and perspectives of non-consumptive users are acknowledged and taken into account to counter-balance any potential historical biases to ensure fair and informed decision-making by the Commission. The growing presence of the non-consumptive community at Commission meetings is fairly recent in the history of the Commission’s public hearings, and welcoming this type of sea change and democratic participation would serve the Commission well in its mission statement. This addition serves to acknowledge the existence of multiple sets of public values and emphasizes the open-mindedness and respect of these diverse values that should be taken into account in decision-making.

### III. VISION STATEMENT

Our suggested revisions to the “Proposed Vision Statement” are:

The California Fish and Game Commission envisions creating a platform for transparency and open dialogue where information, ideas, ~~and~~ facts, public values, best-available science and law,<sup>1</sup> can be easily available, understood and discussed to inform the Commission’s decision-making in<sup>2</sup> support ~~of~~ a biodiverse, natural California in which an array of native fish and wildlife thrives within dynamic ecosystems, supports diverse

needs, [values](#),<sup>3</sup> and uses, and inspires human interaction and enjoyment [for their intrinsic value](#).<sup>4</sup>

The reasoning for these changes is as follows:

1. **“public values, best-available science, and law”** — In addition to “information, ideas and facts,” public values, best-available science and existing law are also critical components to an open and transparent dialogue before the Commission. “Public values” are especially important to the Fish and Game Commission decisions because they account for the wide range of values that the public holds toward wildlife and transparently acknowledges both consumptive and non-consumptive values held in the state that should be taken into account in these fora.
2. **“inform the Commission’s decision-making in support of”**—Because this is a vision statement for the Commission, the statement currently lacks the “action” associated with the creation of a transparent and open platform of discussion. This addition serves to apply the creation of that platform to inform the Commission’s decision-making.
3. **“values”**—The addition of “values” to the list of “needs and uses” accounts for the non-consumptive values of wildlife (i.e. intrinsic) and, critically, removes the capitalistic lens that many people have historically had toward wildlife as resources to be exploited. The Fish and Game Commission would be doing a great service in challenging these historical prejudices toward wildlife and emphasizing their intrinsic value as live beings.
4. **“for their intrinsic value”**—See note 3 above.

In sum, thank you for your consideration of these comments. If you have any questions, please feel free to contact me directly.

Sincerely,



Jean Su  
Staff Attorney & Energy Director  
Center for Biological Diversity  
1411 K Street NW, Suite 1300  
Washington, DC 20005  
[jsu@biologicaldiversity.org](mailto:jsu@biologicaldiversity.org)



Keeping Northwest California wild since 1977

**October 4, 2018**

**TO:**

**California Fish and Game Commission  
P.O. Box 944209  
Sacramento, CA 94224-2090  
Comments sent via email to: [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)**

**Comments on California Fish and Game Commission Draft Potential Mission & Vision Statements**

I am writing on behalf of the Environmental Protection Information Center (EPIC), a nonprofit organization that advocates for the protection of Northwest California's forests, rivers and wildlife using an integrated, science-based approach, combining public education, citizen advocacy, and strategic litigation. Please accept these comments on the draft Mission and Vision Statements.

EPIC finds that the draft statements do not reflect the Commission's statutory and public trust obligations. Accordingly, EPIC recommends that the Commission revise its statements to more accurately reflect its legal obligations.

The proposed text changes contained within the Draft Potential Fish and Game Commission Mission Statement changes the Commission's overall mission in a manner inconsistent with the Commission's statutory and public trust obligations.

The current Mission Statement is "to ensure the long term sustainability of California's fish and wildlife resources...." whereas the proposed mission statement reads, "The California Fish and Game Commission provides leadership to ensure that California will have abundant, healthy and diverse fish and wildlife...." (Emphasis added.)

To "ensure" the long term sustainability is a strong directive that focuses on results, on the other hand, providing leadership to ensure is an ambiguous statement that cannot be quantified or enforced. While we certainly appreciate the Commission understands that it has a prominent leadership role, particularly in setting directives to be enforced by the Department of Fish and Wildlife and rules to be followed by the public, this leadership cannot be separated from the Commission's primary purpose: ensuring that our wildlife resources are protected for this and future generations. The change adds little of value and instead distracts from the Commission's primary purpose, as set forth by the Legislature and as dictated by the Public Trust Doctrine.

---

**Environmental Protection Information Center**

145 G Street, Suite A, Arcata, CA 95521

(707) 822-7711

[www.wildcalifornia.org](http://www.wildcalifornia.org)



Similar to the proposed mission changes, the draft vision statement adds language that dilutes and weakens the overall vision of the Commission.

The current vision reads, “The vision of the Fish and Game Commission, in partnership with the Department of Fish and Wildlife and the public, is to ensure California has sustainable fish and wildlife resources.” (Emphasis added). The proposed vision weakens the Commission’s vision. The vision statement states, “The California Fish and Game Commission envisions creating a platform for transparency and open dialog where information, ideas and facts can be easily available, understood and discussed to support a biodiverse, natural California in which an array of native fish and wildlife thrives within dynamic ecosystems, supports diverse needs and uses, and inspires human interaction and enjoyment.” (Emphasis added).

The Vision Statement fundamentally changes the Commission’s conception of itself from a body that works to maintain the state’s wildlife resources into perpetuity—a charge that demands action, through rulemaking, to fulfill—to a body that provides a “platform” to discuss “ideas and facts” which it turn will “support” California’s extent biodiversity and diverse needs and uses, and will “inspire human interaction and enjoyment.” The new statement is milquetoast nothingness; a bland recital of aspirations that is divorced from the actual work of the Commission. Worse still, the new Vision Statement fails to appreciate that the Legislature envisioned a different role for the Commission—a deliberative body that creates the rules for our human use and interactions with wildlife.

The Public Trust Doctrine, in general, holds that certain lands, waters, and natural resources, such as beaches, navigable rivers, and wildlife, are held by the state in trust for the benefit of the public. As California courts have consistently recognized, wildlife is a public trust resource, acquired when California was granted admission to the state. *See Geer v. Connecticut*, 161 U.S. 519, 529 (1896); *Ex parte Maier*, 37 P. 402, 404 (Cal. 1894); *Betchart v. Dep’t of Fish & Game*, 205 Cal. Rptr. 135, 135-36 (Cal. Ct. App. 1984); *see also City of Berkeley v. Superior Court*, 26 Cal.3d 515, 521 (1980). The Commission’s obligations under the trust are broad and wide—“to protect the people’s common heritage...surrendering that right of protection only in rare cases when the abandonment of that right is consistent with the purposes of the trust.” *National Audubon Society v. Superior Court*, 33 Cal.3d 419, 441 (1983). The proposed changes to the Mission and Vision Statements conflict with the Commission’s obligations under the Public Trust Doctrine as the statements abandon the primary responsibility of the Commission—regulating to ensure the perpetuation of California’s wildlife resources—in favor of more wishy-washy statements of their purpose and work.

The statements further depart from the clear intentions and purposes of the Commission set by the Legislature, as provided in the Fish and Game Code (“Code”). Section 2052 of the Code directs that “[t]he Legislature further finds and declares that it is the policy of the state to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat and that it is the intent of the Legislature, consistent with conserving the species, to acquire lands for habitat for these species.” *See also* Code § 1801. Consistent with this policy, the Legislature delegated to the Commission “the power to regulate the taking or possession of birds, mammals, fish, amphibians, and reptiles.” Code § 200. In many places, the Legislature gives the Commission specific instructions for rulemaking, *see, e.g.*, Code §§ 450 et seq., but in other places the Commission is granted broad authority and latitude. *See, e.g.*, Code § 301. In all rulemaking, however, the Commission is charged with regulating based on the science before it and to clearly state the factual basis for its decisions. Code § 219. A holistic review of the Code confirms the central obligation of the Commission, as phrased in the current Mission

Statement, “to ensure the long term sustainability of California’s fish and wildlife resources....”

Overall, the current Mission and Vision Statements represent a clearer guide and goal for the Commission and one more in line with the Commission’s public trust and statutory obligations. Therefore, EPIC opposes the proposed changes to them. However, if the Commission decides to move forward with the proposed language, EPIC recommends the following changes:

*Potential Vision Statement changes:*

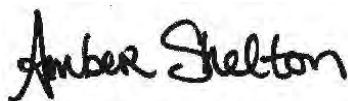
The California Fish and Game Commission envisions ~~creating a platform for transparency and open dialog where information, ideas and facts can be easily available, understood and discussed to support a~~ biodiverse, natural California in which an array of native fish and wildlife thrives within dynamic ecosystems, ~~supports diverse needs and uses, and inspires human interaction and enjoyment.~~

*Proposed Mission Statement changes:*


The Mission of the California Fish and Game Commission ~~provides leadership to~~ is to ensure that California will have abundant, healthy, and diverse fish and wildlife, ~~managed with public confidence and participation, through actions that are thoughtful, bold, and visionary in an ever-changing environment.~~ We recognize our public trust responsibilities as well as the cultural value of our fish and wildlife and, therefore, work collaboratively with other government agencies, tribes, non-governmental organizations and the people of California to establish scientifically-sound policies and regulations ~~that support to protect, enhance and restore~~ California’s native fish and wildlife in their natural habitats, to ~~securing~~ a rich outdoor heritage for all generations to experience and enjoy.

Thank you for the opportunity to provide input on the Commission’s proposed changes to the mission and vision statements. Feel free to contact me if you have any questions regarding these comments and please ensure that I receive public notices related to these proposed changes in the future.

For the wild,



Amber Shelton, Conservation Advocate  
Environmental Protection Information Center  
145 G Street, Suite A  
Arcata, CA 95521  
Email: [amber@wildcalifornia.org](mailto:amber@wildcalifornia.org)  
Phone: (707)822-7711

PUBLIC INTEREST COALITION	 SIERRA CLUB FOUNDED 1892	<b>Humane Society of the Sierra Foothills</b>
<b>P.O. Box 761</b>	<b>Placer Group</b>	<b>2945 Bell Rd, #175</b>
<b>Loomis, CA 95650</b>	<b>P.O. Box 7167, Auburn, CA 95604</b>	<b>Auburn, CA 95603</b>

[Sent via email: [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)

October 4, 2018

To: CA Fish and Game Commission

Re: **Draft Potential FGC Core Values—10-17-18-Agd Item 16**

We strongly support the CA Fish and Game Commission's (FGC) focus on assuring resource sustainability and appreciate its Strategic Plan (SP) Challenges and Goals (December 4, 1998). Because the FGC's Mission and Vision Statements are well established and accepted by most, we believe adopted core values must conform to those two foundational statements and the SP policy summaries.

The mission statement clearly states that "on behalf of California citizens," the FGC is to ensure the long-term sustainability of California's fish and wildlife resources. It is critical to recognize that more than 99% of "California citizens" are non-consumptives (less than 1% are consumptives with numbers declining). The vision statement is just as clearly stated: Assure California has..."Sustainable Fish and Wildlife Resources." It is equally critical to recognize that this includes "sustainability" for non-consumptives who view, study, photograph, and delight in simply spotting wildlife.

The process of establishing core values must not only incorporate those two statements but also consider the "ever-evolving" Strategic Plan, which "will be revisited at least annually to determine if it still serves the resources and the Commission in the ways intended."

Additionally, the 1998 SP recognized CA's "diminishing fish and wildlife resources," their "management," and the role of the FGC in meeting these challenges. The SP notes that since the inception of the FGC (1870), the emphasis has changed "from resource utilization to resource sustainability." We submit that although intentions may be honorable, with ever-increasing losses of critical resource habitats, that therefore "management approaches" must be re-visited with conservation as the primary focus and goal, as opposed to resource utilization or consumption "uses." The top priority to address must be the "need" of the resources themselves—not the need (recreational or otherwise) of either consumptives or non-consumptives.

As "stewards of CA's fish and wildlife resources," the FGC is the trustee with mandated obligations to hold these commonwealth resources in public trust. We submit that (1) such a critical responsibility should not be abdicated to serve or satisfy the wants of humans or special interests; and (2) since the SP was adopted, the past 20 years have resulted in even greater diminishment of our resources, and/or their health, vibrancy, and resilience. This deterioration may not be due solely to FGC's actions or non-actions, but it calls for an honest evaluation of the FGC's decision-making approach that favors the wants of consumptives over resource needs. Now with Climate Change (CC) impacts added to the mix, including catastrophic fires, the FGC cannot or should not continue with a "business as usual" mindset.

With the above considerations, we urge the FGC to include these suggestions, starting with the core values' framework.

Integrity and Transparency: We submit that the pledges “to transparently fulfill our duties...” and to responsibly gather information must include full disclosure of any real or potential conflicts of interest. Commissioners or staff that will be voting or creating documents for review, ISOR’s, staff reports and recommendations, etc., may benefit from an action item, or a change in policy, etc. For example: If commissioners or staff associated with a consumptive decision-making action (hunting or fishing) participates in or benefits from that activity, or intends to purchase a license to participate in the consumptive activity, then that commissioner(s) or staff person(s) must divulge that fact. They still may be able to be objective throughout the decision-making process; however, because there may be a perception of a conflict of interest, transparency should require disclosure statements.

Collaboration and Excellence: Recognition of the “diversity of stakeholders” and “the people of California” being included in the “problem-solving and decision-making processes” is greatly appreciated. This is an area where the desired mutually beneficial arrangement that leverages resources to achieve “shared goals,” and deliver “fair and accessible services...” needs much more scrutiny. Although it may be subtle, we have observed a definite bias rather than shared goals when it comes to “leveraging” the resources. This is apparent in the often-skewed make-up of stakeholder working groups. Consumptives are, or have been, represented in percentages much greater than their numbers would warrant when compared to the State’s non-consumptive population. The inequality seems to ignore the fact that all fish, wildlife, natural resources, etc., belong to all stakeholders; yet non-consumptives are not included in such groups in ratios related to their numbers in California.

We submit the following re-wording to consider in the Vision and Mission Statement proposed revisions.

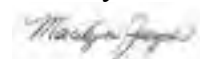
Potential Vision Statement. Use of the word “needs” in the phrase “...supports diverse needs and uses,” is problematic. It suggests “needs and uses” of humans. Native fish and wildlife should not be perceived as a commodity to “support” any needs or uses of people. It exists for its own sake in a hopefully ecologically balanced system. We urge rewording of that phrase to clarify by incorporating a more defined scope, such as, “...supports diverse ecological functions.”

Potential Mission Statement. The statement, “...establish scientifically-sound policies and regulations that support the restoration, conservation and sustainability of California’s fish and wildlife in their natural habitats,” is appropriate. However, we urge a revision at the end of that sentence (“...securing a rich outdoor heritage for all generations to experience and enjoy”). Please consider changing the word “enjoy” to “respect.” As currently worded, its meaning could be interpreted that fish and wildlife exist for human enjoyment, when human benefit should be considered secondary.

This perception or concern is reinforced in the “Concepts Considered...” (page 2 of the Mission Statement, second to last bulleted paragraph) with the word, “Creating opportunities for public use and enjoyment...” Balancing human benefits may sound reasonable, but we urge that the needs of the natural environment take top priority over any human benefits or enjoyment and be stated as such.

We urge the FGC to honor its public trust role and put fish and wildlife’s natural environment and health first, regardless of pressures—political, lobbying, economic, or personal preferences. This is not a simple task.

Thank you for considering our views,



Marilyn Jasper

VIA EMAIL

October 4, 2018

California Fish and Game Commission  
[Fgc@fgc.ca.gov](mailto:Fgc@fgc.ca.gov)

RE: California Fish and Game Commission Draft Potential Commission Core Values, Mission and Vision Statements

Dear Sirs,

The Port of San Diego (Port) appreciates the opportunity to provide comments in response to the California Fish and Game Commission's Draft Potential Commission Core Values, Mission and Vision Statements, dated September 23, 2018. The Port is entrusted with protecting the Public Trust resources in and around San Diego Bay, which include navigation, commerce, fisheries, recreation, and environmental stewardship.

The Port is supportive of the Commission's ambitious effort to adopt core values through its strategic planning process and to update its mission and vision statements. The Port recognizes the inclusiveness of the many key concepts that have been discussed over time and included in these proposed updated statements. From ecological integrity and resiliency, biodiversity, long-term sustainability, stewardship, and valuing relationships with all stakeholders, to balancing the needs of the natural environment while creating opportunities for public use and enjoyment, we appreciate this comprehensive approach.

Many of the elements proposed are also in alignment with the Port's values, mission and vision. The Port's mission is to protect the Tidelands Trust resources by providing economic vitality and community benefit through a balanced approach to the maritime industry, tourism, water and land recreation, environmental stewardship, and public safety. In line with this is a vision to be an innovative, global seaport courageously supporting commerce, community and the environment.

As it relates to a balance between natural resources and public use, we encourage the Commission to include language that embraces our natural resources in a way that allows California to be self-reliant, and not depend on the resources of other nations. This could include providing support for existing, new, and emerging environmental and economically viable opportunities that can take advantage of our vast, renewable resources and assure that California has sustainable fish and wildlife resources for now and into perpetuity.

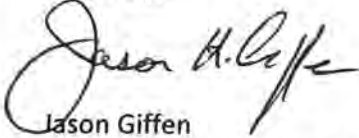
Thank you for the opportunity to respond to the Commission's draft core values, mission and vision statements. The Port stands ready to continue to support the Commission's strategic planning process, as well as other State and Federal policies to ensure sustainable fish and wildlife resources in California. Ports can and are increasingly playing a critical role in these sustainable resources, given their familiarity and expertise in the permitting and entitlement process for a variety of coastal and ocean uses; the



unique role they often play as landlord, operator and/or regulator, and as champions of the blue economy.

If you have any questions or need any additional information, please do not hesitate to contact Paula Sylvia at 619-686-6491 or [psylvia@portofsandiego.org](mailto:psylvia@portofsandiego.org), or myself at 619-686-6473 or [jgiffen@portofsandiego.org](mailto:jgiffen@portofsandiego.org).

Sincerely,

A handwritten signature in black ink, appearing to read "Jason H. Giffen". The signature is fluid and cursive, with a large initial "J" and a stylized "G".

Jason Giffen  
Assistant Vice President, Planning & Green Port

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**From:** Bob Bertelli

**Sent:** Thursday, October 4, 2018 03:37 PM

**To:** FGC

**Subject:** Comments on the Draft Revision of the FGC Core Values, Vision, and Mission Statement

Comments submitted by Bob Bertelli

FGC Commissioners and Staff,

I have reviewed the Draft Revision. Overall I find it quite compelling, demonstrating a careful, clear use of language.

I was impressed by the word choices in Core Values pertaining to Stewardship. "We use credible science..." and "The dynamic nature of science".

However, In the Potential Mission segment, paragraph 5, the language is changed to read, "...that relies on the best readily available science...".

"Credible Science", sets the bar high enough where the Commission has a reasonable expectation of making informed, correct decisions when managing California's resources. Credible science is rigorous in its methods of investigation, and has withstood equally rigorous inquiry to its validity. Understanding that because of the "Dynamic nature of science" it is Never Settled, but "Credible Science" should take president over "best readily available science" which is a lower standard, often being hot off the press, and may not have met proper science rigor.

Words matter in Life, Law and Science, therefore I would recommend using "Credible Science" in the proposed Commission Mission Statement, and as the standard for Commissions decisions.

Thank you for considering my comments.

Bob Bertelli

Sent from Mail for Windows 10

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**From:** Mary Mote

**Sent:** Monday, September 24, 2018 11:39 AM

**To:** FGC

**Subject:** Re: Help shape the foundation for the future of the Commission!

Dear Sirs,

When you discuss your revised vision, please discuss the habituated coyotes that are taking over our neighborhoods and killing our family pets. We are seeing coyotes day and night now, and as they have no predator, they are not afraid of us. Many pets have been taken from their own fenced back yards and some grabbed right off leashes while being walked and destroyed painfully. We now see them on school grounds and I fear a child will be attacked. I think it is inevitable.

When cities stopped trapping the few that wandered into neighborhoods, allowing their numbers to increase, was when the trouble started. The problem is not going to get better, but only get worse. Unfortunately some are still listening to Project Coyote and PETA, which is a shame, because what they preach has been proven wrong again and again. We, the citizens who love our pets, have seen so many eaten alive and it is heart breaking.

Please allow cities to trap and euthanize the most aggressive ones and ones that den close to schools and neighborhoods.

It would be a start to controlling the numbers and perhaps save a child from abject sadness from seeing their pet destroyed in front of their eyes, it is a horrible sight.

Thank you for listening, I appreciate all the work you do..

Mary Mote

Long Beach, ca

**From:** Art Seavey <[art@montereyabalone.com](mailto:art@montereyabalone.com)>

**Sent:** Monday, September 24, 2018 05:49 PM

**To:** FGC; Trevor Fay

**Subject:** comment regarding

To Whom It May Concern,

Thank you for this opportunity to comment regarding the mission of the Fish and Game Commission.

I have been a partner in a small abalone farm since 1994. In the mid 90's, 13 different groups had permits to farm abalone in our state. Today, there are just four operating farms. The Commission has not issued a new state water bottom lease for aquaculture in 20 years. There has never been a marine fish farm in California, salmon farming is illegal. Shellfish farming remains, though in a precarious state after decades of decline.

The Department of Fish and Wildlife is the lead agency for aquaculture in California. Unfortunately, it appears as though the Department has abdicated this responsibility to the California Coastal Commission because the CCC, through restrictive and expensive permit conditions determines the operating conditions for any and all aquaculture in the coastal zone.

I would respectfully request that the Commission provide leadership to the Department and the state in order to invigorate responsible stewardship of the appropriate resources for aquaculture in our state. There is immense potential for sustainable, healthy food production!

Thank you for considering this request.

Art Seavey, Partner

Monterey Abalone Company

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**From:** Don Thompson

**Sent:** Monday, September 24, 2018 09:22 PM

**To:** FGC

**Subject:** Re: Help shape the foundation for the future of the Commission!

these draft Core Values, etc. read like an admission of guilt.....the suggestion that this needs to be adopted implies that these values have been lacking; i.e. "transparency".

Truthfully in the 3 decades that I have observed the Commission and Dept. conduct their business, what has been lacking are facts. And a lot of smoke and mirrors by the DFW that create a big lie by omission.

I'm really disappointed, by all the emotional appeals and propaganda that has been the foundation of all the MPA's all over the place on top of fishing moratoriums, and already overregulated species specific rules.

What we have is a lot of manufactured crisis'. Based on the data that supports the desired outcome.

Sincerely

Don Thompson

displaced commercial abalone fisherman.



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**From:** David Orong  
**Sent:** Monday, September 24, 2018 11:43 PM  
**To:** FGC  
**Subject:** Re: Help shape the foundation for the future of the Commission!

What about accountability? Following up on action items and giving timelines for completion of projects. Not just tabling items for the next meeting. Make sure that members are accountable for attending meetings. If not, have a person represent the area. Perhaps have a civilian representative. I would be more than happy to represent my regional area.

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**From:** Kris Nikolauson  
**Sent:** Friday, September 28, 2018 12:58 PM  
**To:** FGC  
**Subject:** Core values

Dear Mr. Weasel,

Please consider in your core values the willingness to fight for Middle Butte creeks return to full water flow. It appears to me that F&W is afraid to confront PG&E and reinstate the water to Middle Butte Creek which has flowed since time began. Our community has enjoyed a park on NimsheW road with a pond, stream, and waterfall for 30 years. Now it dries up in the summer thanks to PG&E lining the upper Centerville Canal with a plastic liner. This liner does not allow the water table to be replenished as before. Nor does it allow small animals an escape from drowning. All the fish in the creek are dead and the water level in the pond is a health hazard for the community. We are asking for a minimum of 5cfs to be restored to the stream. I hope you are serious about changing your core values. We are depending on it.

Kris Nikolauson

## Memorandum

2018 OCT 10 AM 9:00

Date: October 8, 2018

To: Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Submission of Initial Statement of Reasons to Amend Subsection (b) of Section 27.65, Title 14, California Code of Regulations, Re: Filletting of Fish on Vessels; California Sheephead**

The Department of Fish and Wildlife (Department) requests the Fish and Game Commission (Commission) authorize publishing notice of its intent to amend subsection (b) of Section 27.65 of Title 14, California Code of Regulations (CCR), concerning the addition of a California sheephead fillet length regulation. Authorization of the request to publish notice will allow for discussion and possible adoption at the December 12-13, 2018 and February 6-7, 2019 Commission meetings, respectively.

Almost all finfishes with a recreational minimum size limit also have a corresponding fillet length. However, a fillet length regulation for California sheephead has not been created since the implementation of a minimum size limit [Section 28.26(c), Title 14, CCR] in 2001. Since then, recreational anglers and the sport fishing industry, including the Sportfishing Association of California, have been advocating for the implementation of a fillet length regulation permitting California sheephead to be filleted at sea. The Department recommends the establishment of a California sheephead fillet length regulation commensurate with its minimum size limit of 12 inches.

If you have any questions regarding this item, please contact Dr. Craig Shuman, Marine Regional Manager at (916) 445-6459. The public notice for this rulemaking should identify Environmental Scientist, Miranda Haggerty as the Department's point of contact. Her contact information is (562) 342-7162 or [Miranda.Haggerty@wildlife.ca.gov](mailto:Miranda.Haggerty@wildlife.ca.gov).

ec: Stafford Lehr, Deputy Director  
Wildlife and Fisheries Division  
[Stafford.Lehr@wildlife.ca.gov](mailto:Stafford.Lehr@wildlife.ca.gov)

Melissa Miller-Henson, Acting Executive Director  
Fish and Game Commission  
October 8, 2018  
Page 2

Craig Shuman, D. Env., Regional Manager  
Marine Region  
[Craig.Shuman@wildlife.ca.gov](mailto:Craig.Shuman@wildlife.ca.gov)

Bob Puccinelli, Captain  
Law Enforcement Division  
[Robert.Puccinelli@wildlife.ca.gov](mailto:Robert.Puccinelli@wildlife.ca.gov)

Michelle Selmon, Program Manager  
Regulations Unit  
[Michelle.Selmon@wildlife.ca.gov](mailto:Michelle.Selmon@wildlife.ca.gov)

Ona Alminas  
Senior Environmental Scientist  
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[Kirsten.Ramey@wildlife.ca.gov](mailto:Kirsten.Ramey@wildlife.ca.gov)

Chuck Valle, Marine Region  
Senior Environmental Scientist  
[Chuck.Valle@wildlife.ca.gov](mailto:Chuck.Valle@wildlife.ca.gov)

Miranda Haggerty, Marine Region  
Environmental Scientist  
[Miranda.Haggerty@wildlife.ca.gov](mailto:Miranda.Haggerty@wildlife.ca.gov)

Susan Ashcraft, Marine Adviser  
Fish and Game Commission  
[Susan.Ashcraft@fgc.ca.gov](mailto:Susan.Ashcraft@fgc.ca.gov)

STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION

Amend Subsection (b) of Section 27.65  
Title 14, California Code of Regulations  
Re: Filleting of Fish on Vessels; California Sheephead

I. Date of Initial Statement of Reasons: October 8, 2018

II. Dates and Locations of Scheduled Hearings:

(a) Notice Hearing: Date: October 17, 2018  
Location: Fresno

(b) Discussion Hearing: Date: December 12, 2018  
Location: Oceanside

(c) Adoption Hearing: Date: February 7, 2019  
Location: Redding

III. Description of Regulatory Action:

(a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

**Present Regulations**

Section 27.65, Title 14, California Code of Regulations (CCR) defines fillet; lists the fillet requirements for, and specifies those fish that may be filleted on a boat or brought ashore as fillets; and prohibits the filleting, steaking, or chunking of any species with a size limit unless a fillet size is otherwise specified. Section 28.26, Title 14, CCR, specifies the bag limit, size limit, open areas, seasons and depth constraints for the recreational take of California sheephead (*Semicossyphus pulcher*).

Almost all finfishes with a recreational minimum size limit also have a corresponding fillet length. However, a fillet length regulation for California sheephead, a popular recreational fishery in southern California, has not been created since the implementation in 2001 of a minimum size limit of 12 inches (subsection 28.26(c), Title 14, CCR).

**Proposed Regulation Changes**

The proposed regulation will amend subsection 27.65(b) to add California sheephead to the list of fish that may be filleted, and will specify that fillets must be a minimum of 6 and three-quarter inches in length and bear the entire skin intact. The proposed amendment would list the California sheephead fillet regulation under subsection (b)(12) and the previously listed subsection (b)(12) would be renumbered to subsection (b)(13).



### **Necessity of Proposed Regulation**

Recreational anglers and the sport fishing industry, including the Sportfishing Association of California (SAC), have been requesting a fillet length regulation permitting California sheephead to be filleted at sea. Most recreational anglers prefer to take home fresh fillets, rather than whole fish. In addition, California sheephead are difficult to fillet, so many anglers prefer to have experienced deck hands fillet their fish at sea for them. The proposed regulation would meet angler preferences for transport of cleaned fish.

It is necessary for the entire California sheephead skin to remain intact, since there could be difficulty in species identification if just a patch of skin was left on the fillet. Other species that could be confused with California sheephead by a single patch of skin left on the fillet include red-skinned rockfish species (*Sebastes* sp.), such as vermilion (*S. miniatus*), and canary rockfish (*S. pinniger*).

### **Potential Impact of Regulation Change**

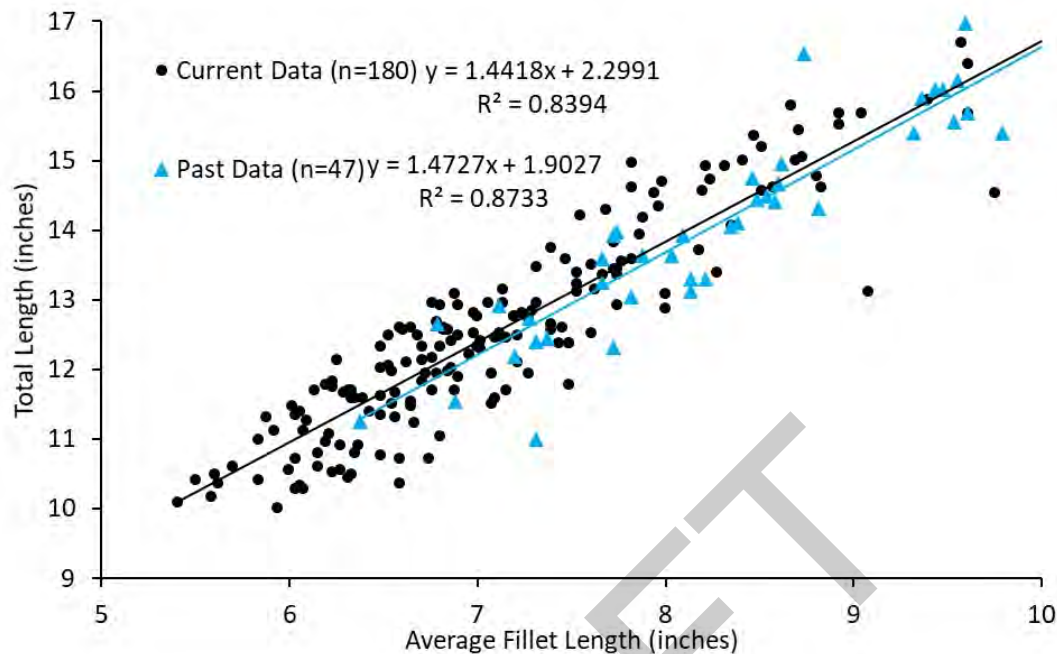
A potential impact of implementing a fillet length regulation is an increase in California sheephead harvest. However, the fishery is managed under a total allowable catch, so any possible increase in harvest will not impact the sustainability of the population. The number of California sheephead that are released because they cannot be filleted at sea is not known. On average, 15 percent of the California sheephead catch is discarded, and although the exact lengths of the discarded catch are not known, the majority are most likely under-sized catch that cannot be retained regardless of the fillet length regulation. Allowing filleting of California sheephead at sea might lower the number of discards by a small percentage. More importantly, a fillet length regulation would allow carcasses to be disposed of at sea after filleting and recycled back into the marine ecosystem, instead of anglers disposing of carcasses at home.

### **Data Collection and Analysis**

Data necessary to support the proposed regulation have been collected through a collaborative effort between SAC and the California Department of Fish and Wildlife (Department). A total of 180 California sheephead were collected on three sampling trips off commercial passenger fishing vessels (CPFVs) over a wide expanse of reefs in Long Beach, Dana Point and San Diego during April 2018. Commercial fish traps were used to assure that only the appropriate sizes of California sheephead were collected, and all other fish could be released alive. Fish sizes ranged from 10-16 inches, with the majority (66 percent) surrounding the current minimum size of 12 inches (11-13 inches). The deckhands working on each CPFV filleted all the fish aboard the vessels while at sea to ensure realistic conditions of how other fishes are currently filleted. In addition, fish were filleted by six individuals with varying experience to account for possible differences in filleting ability. Department biologists measured the total length of the fish and the corresponding left and right fillet to the nearest millimeter.

The data were analyzed by taking the average of the two fillets in a pair, and then determining the relationship between average fillet length and total length of the fish by a regression analysis. This was also done for data collected in a past Department study in 2002-2003 and compared to the current study. Not only was there a very strong relationship between average fillet length and total fish length, but there was no significant

difference between current and past studies despite differences in filleting experience, sampling locations, and time periods (Figure 1).

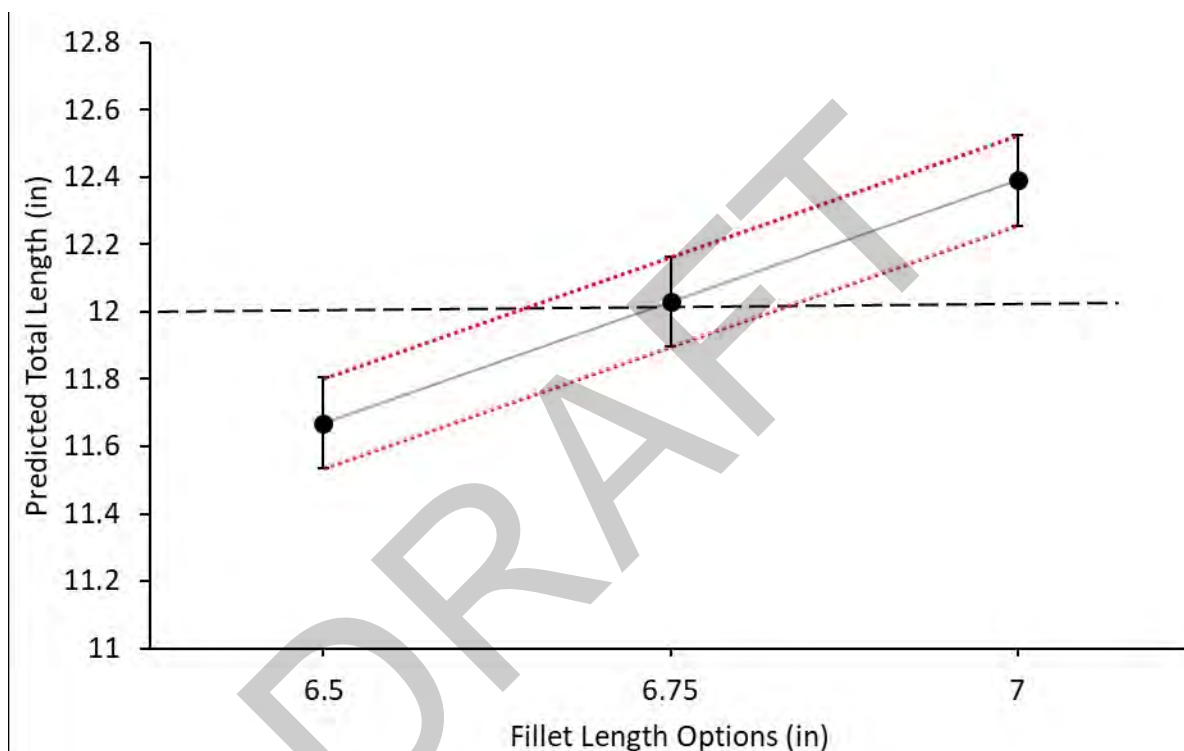


**Figure 1.** The relationship between average fillet length and total length of California sheephead for the current (black circles) and past (blue triangles) Department studies. The equation of the line and  $R^2$  value for each are listed below the respective legend. The equations shown are measurements of the modeled regression line, where “x” is a coefficient that determines how “y” will increase. “ $R^2$ ” ranges between 0 and 1, where an  $R^2$  value closer to 1 means a closer relationship that the data fits to the modeled regression line. The “n” values refer to sample size (180 in the current study; 47 in the past study).

From the results of the analysis, the equation of the line from the current data was used to predict the fillet length from a legal-sized 12-inch fish. Plugging 12 inches into the equation of the line predicts a 6.8-inch fillet length with lower and upper 95 percent confidence intervals of 6.66 and 6.92 inches, respectively. This means that from the 180 samples and varying filleting experience of deckhands the Department analyzed, there’s a 95 percent chance that the true mean of the fillet size from the sampled California sheephead population would be between 6.66 and 6.92 inches. Since fillet lengths are easiest to measure at a minimum of quarter inch intervals, the data portray two fillet length possibilities of either rounding down to 6.75 inches or rounding up to 7 inches. To aid in determining which possible fillet length is the most reasonable for a legal California sheephead, the possible fillet lengths were plugged back into the equation of the line to predict the total length with 95 percent confidence intervals (Table 1, Figure 2). The 7-inch fillet length has a predicted total length of over 12 inches ( $12.39 \pm 0.21$  inches) which reduces the likelihood of cutting a legal-sized fillet from a sublegal fish, but also might make it challenging to achieve a legal-sized fillet from a legal 12-inch fish. Thus, the recommended fillet length is 6.75 inches, as the predicted total length is the closest to 12 inches ( $12.03 \pm 0.21$  inches), which provides an attainable-sized fillet length and should prevent legal-sized fillets to be easily cut from sublegal-sized fish.

Analyzed Fillet Lengths (inches)	Predicted Fish TL (inches)	95% CI
6.5	11.67	11.47-11.88
6.75	12.03	11.83-12.24
7	12.39	12.18-12.6

**Table 1.** The predicted total lengths (TL) and associated 95 percent confidence intervals (CI) for three fillet length options.



**Figure 2.** The predicted total length in inches for the fillet length options of 6.5, 6.75, or 7 inches based on the regression results of average fillet length and total length of fish. The red dotted lines represent the upper and lower 95 percent confidence intervals. The dashed black line at 12 inches denotes the current minimum size limit of California sheephead (Section 28.26, Title 14, CCR).

### Changes to Authority and Reference Citations

Senate Bill 1473 (Stats. 2016, ch. 546) made organizational changes to the Fish and Game Code that became effective January 1, 2017. In accordance with these changes to the Fish and Game Code, Section 202 is removed from, and Section 265 is added to the authority and reference citations; Section 220 is removed from the reference citations; and Section 240 is removed from, and Section 399 is added to the reference citations.

#### (b) Goals and Benefits of the Proposed Regulation:

It is the policy of the state ensure the conservation, sustainable use, and where feasible, restoration of California's living marine resources of the benefit of all the citizens of the state. The objective of this policy shall be, among other things, to involve all interested parties in marine living resource management decisions.

The proposed regulation is in response to SAC and the recreational angling community, who have been requesting a fillet length regulation for California sheephead since 2001. As such, the regulation may increase angler satisfaction.

The proposed regulation may benefit the health and welfare of California residents through the increased consumption of nutritious California sheephead, and may benefit the environment through the return of California sheephead carcasses to the sea to be recycled back to the marine ecosystem.

(c) Authority and Reference Sections from Fish and Game Code for Regulation:

Authority: Sections 200, 205, 265, 313, 5508 and 5509, Fish and Game Code.

Reference: Sections 200, 205, 265, 313, 399, 5508 and 5509, Fish and Game Code.

(d) Specific Technology or Equipment Required by Regulatory Change: None.

(e) Identification of Reports or Documents Supporting Regulation Change: None.

(f) Public Discussions of Proposed Regulations Prior to Notice Publication:

The Department mailed notification letters on July 16, 2018 to tribes that may be impacted or interested in this rulemaking. The Department received responses from two tribes, neither of which expressed concerns on the proposed regulation, or provided any other specific input.

No public meetings are scheduled prior to the notice publication. The 45-day public notice comment period provides adequate time for review of the proposed regulation.

IV. Description of Reasonable Alternatives to Regulatory Action:

(a) Alternatives to Regulation Change:

Two alternatives to the recommended 6.75-inch fillet were analyzed: a slightly smaller (6.5-inch) or larger (7.0-inch) fillet length. A 6.5-inch fillet length was obtained as an alternative by rounding down from the predicted 6.8 inches to the nearest half inch instead of quarter inch interval. A 6.5-inch fillet length has a predicted total length under 12 inches ( $11.67 \pm 0.21$ ; Table 1 and Fig. 2), which means a legal-sized fillet could often be cut from a sublegal-sized fish, so this alternative was rejected. The 7.0-inch fillet length alternative would allow an easily identifiable round number and would reduce the likelihood of cutting a legal-sized fillet from a fish under 12 inches. However, it may also make it challenging to achieve a legal-sized fillet from a legal 12-inch fish, since the expected length of a fish from which a 7.0-inch fillet is cut would be 12.39 inches (per Figure 2). Therefore, this alternative was also rejected. Since there are other fishes with a current fillet length to the closest

quarter inch (e.g., 16.75 inches for California halibut), the 6.75-inch fillet length is the Department's recommended size.

(b) No Change Alternative:

The no change alternative would leave existing regulations in place, and not allow for filleting of California sheephead on board vessels. Some deckhands on CPFVs partially fillet California sheephead so fillets remain attached to the carcass, and the angler only has to make one cut to remove them. However, it is possible that the fillet could become detached from the body, resulting in a violation. In addition, the angler would still need to carry home and discard the carcass. The no change alternative would not lead to any increase in angler satisfaction, nor would it allow California sheephead carcasses to be recycled back into the marine ecosystem.

V. Mitigation Measures Required by Regulatory Action:

The proposed regulatory action will have no negative impact on the environment; therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action:

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made:

(a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

The proposed action will not have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states, because the proposed regulation will not increase net compliance costs or impact fishing effort and recreational fishing expenditures for recreational fishing related businesses. While not significant or statewide, CPFV businesses may choose to spend an estimated \$60-\$110 per year on more plastic bags for the additional fillets and for the maintenance of fillet knives. This equates to \$12,660 - \$23,210 in costs for all CPFVs statewide. This will not affect the ability of California businesses to compete with businesses in other states because these small individual expenditures would increase customer satisfaction, and be offset by fillet fee revenue.

(b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment.

The Commission does not anticipate any impacts on the creation or elimination of jobs, the creation of new business, the elimination of existing businesses or the expansion of businesses in California because the proposed regulation is not likely to increase or decrease recreational fishing opportunities within California. It is possible that the implementation of the proposed regulation may increase workload for deckhands aboard CPFVs as the number of fish that can be filleted in an angler's catch at the end of the day



will increase. However, it is unlikely that the demand will increase so much that additional jobs will be necessary.

The Commission anticipates benefits to the health and welfare of California residents through the consumption of more California sheephead, a nutritious food.

The Commission does not anticipate any benefits to worker safety.

The Commission anticipates some benefit to the state's environment through the return of California sheephead carcasses to the marine ecosystem after being filleted.

(c) Cost Impacts on a Representative Private Person or Business:

This regulatory action will allow for the option for individuals to choose to pay \$2-\$3 per fillet, which may amount to as much as \$10 -\$15 per CPFV trip. Individual CPFV businesses may choose to spend an estimated \$60-\$110 per year on more plastic bags for the additional fillets and for the maintenance of fillet knives.

(d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State: None.

(e) Nondiscretionary Costs/Savings to Local Agencies: None.

(f) Programs Mandated on Local Agencies or School Districts: None.

(g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code: None.

(h) Effect on Housing Costs: None.

VII. Economic Impact Assessment

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State:

The Commission does not anticipate impacts on the creation or elimination of jobs within the state because the proposed action is not likely to cause substantial changes in the catch of California sheephead. There is the possibility that an increase in the total number of fish being filleted could cause an increase in the workload of deckhands. It is unlikely that the demand will increase so much that additional jobs will be necessary.

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State:

The Commission does not anticipate the creation of any new businesses, or elimination of existing businesses, because the proposed regulation is not likely to increase or decrease recreational fishing opportunities within California.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State:

The Commission does not anticipate any effects substantial enough to induce the expansion of businesses currently doing business in the state. The implementation of a California sheephead fillet length regulation could cause a small increase in fillet fee revenue to CPFV businesses. Depending on the average price of \$2-\$3 estimated to be charged for filleting California sheephead, a total annual increase in revenue of \$56,000 to \$85,000 may be received amongst all CPFV businesses, or an estimated \$269-\$403 per CPFV. These estimates are based on the average annual catch of California sheephead from 2013 to 2017, which can fluctuate depending on a variety of environmental, biological and economic factors

(d) Benefits of the Regulation to the Health and Welfare of California Residents:

The Commission anticipates benefits to the health and welfare of California residents through the consumption of more California sheephead, a nutritious food.

(e) Benefits of the Regulation to Worker Safety:

The Commission does not anticipate any benefits to worker safety because the proposed regulation does not affect existing working conditions.

(f) Benefits of the Regulation to the State's Environment

The Commission anticipates some benefit to the state's environment through the return of California sheephead carcasses to the marine ecosystem after filleting instead of disposing of carcasses on land.

## Informative Digest/Policy Statement Overview

Section 27.65, Title 14, California Code of Regulations (CCR) defines fillet; lists the fillet requirements for, and specifies those fish that may be filleted on a boat or brought ashore as fillets; and prohibits the filleting, steaking, or chunking of any species with a size limit unless a fillet size is otherwise specified. Section 28.26, Title 14, CCR, specifies the bag limit, size limit, open areas, seasons and depth constraints for the recreational take of California sheephead (*Semicossyphus pulcher*).

The proposed regulatory change to subsection 27.65(b), Title 14, CCR, adds a 6.75-inch minimum fillet length, and requires that the entire skin remain intact, allowing legal-sized California sheephead to be filleted on board vessels while at sea and brought ashore as fillets.

In addition, authority and reference citations are proposed to be amended in accordance with recent organizational changes to Fish and Game Code.

The proposed regulation is in response to Sportfishing Association of California (SAC) and the recreational angling community that have been requesting a fillet length regulation for California sheephead since 2001. As such, the regulation may increase angler satisfaction. Additionally, the proposed regulation may benefit the health and welfare of California residents through the increased consumption of nutritious California sheephead, and may benefit the environment through the return of California sheephead carcasses to the sea to be recycled back to the marine ecosystem.

The proposed regulations are neither inconsistent nor incompatible with existing state regulations. Section 20, Article IV, of the State Constitution specifies that the Legislature may delegate to the Fish and Game Commission (Commission) such powers relating to the protection and propagation of fish and game as the Legislature sees fit. The Legislature has delegated to the Commission the power to regulate the recreational take of fish. The Commission has reviewed its own regulations and finds that the proposed regulations are neither inconsistent nor incompatible with existing state regulations. The proposed regulation is consistent with existing state regulations as almost all finfishes with a recreational minimum size limit also have a corresponding fillet length. The Commission has searched the California Code of Regulations and finds no other state agency regulations pertaining to the recreational take of California sheephead, or to the filleting of fish on board vessels at sea.

## Proposed Regulatory Language

Section 27.65, Title 14, CCR, is amended to read:

### **§27.65. Filleting of Fish on Vessels.**

*. . . [ Subsections (a) and (b) are provided for context only. No changes are proposed ]*

(a) Definition of Fillet: For the purpose of this section a fillet is the flesh from one side of a fish extending from the head to the tail which has been removed from the body (head, tail and backbone) in a single continuous piece.

(b) Fish That May be Filleted: No person shall fillet on any boat or bring ashore as fillets any fish, except in accordance with the following requirements:

*. . . [ No changes to subsections (b)(1) through (b)(11) ]*

(12) California sheephead: Fillets must be a minimum of 6 and three-quarter inches in length and shall bear the entire skin intact.

~~(12)-(13)~~ All other species except those listed in subsection (c) of this section: Each fillet shall bear intact a one-inch square patch of skin. The fillets may be of any size.

*. . . [ No changes to subsection (c) ]*

Authority cited: Sections 200, ~~202~~, 205, 265, 313, 5508 and 5509 Fish and Game Code.  
Reference: Sections 200, ~~202~~, 205, ~~220~~, ~~240~~, 265, 313, 399, 5508 and 5509 Fish and Game Code.

**ECONOMIC AND FISCAL IMPACT STATEMENT****(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

**ECONOMIC IMPACT STATEMENT**

DEPARTMENT NAME <b>Fish and Game Commission</b>	CONTACT PERSON <b>Miranda Haggerty, Environmental Scientist</b>	EMAIL ADDRESS <b>Miranda.Haggerty@wildl</b>	TELEPHONE NUMBER <b>562-342-7162</b>
DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400 <b>Amend subsection (b) of Section 27.65, Title 14, CCR, re: Filleting of Fish on Vessels; California sheephead</b>			NOTICE FILE NUMBER <b>Z</b>

**A. ESTIMATED PRIVATE SECTOR COST IMPACTS** *Include calculations and assumptions in the rulemaking record.*

1. Check the appropriate box(es) below to indicate whether this regulation:

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> a. Impacts business and/or employees | <input type="checkbox"/> e. Imposes reporting requirements              |
| <input checked="" type="checkbox"/> b. Impacts small businesses          | <input type="checkbox"/> f. Imposes prescriptive instead of performance |
| <input type="checkbox"/> c. Impacts jobs or occupations                  | <input checked="" type="checkbox"/> g. Impacts individuals              |
| <input type="checkbox"/> d. Impacts California competitiveness           | <input type="checkbox"/> h. None of the above (Explain below):          |

*If any box in Items 1 a through g is checked, complete this Economic Impact Statement.  
If box in Item 1.h. is checked, complete the Fiscal Impact Statement as appropriate.*

2. The Fish and Game Commission estimates that the economic impact of this regulation (which includes the fiscal impact) is:  
(Agency/Department)

- ☒ Below \$10 million  
☐ Between \$10 and \$25 million  
☐ Between \$25 and \$50 million  
☐ Over \$50 million *(If the economic impact is over \$50 million, agencies are required to submit a Standardized Regulatory Impact Assessment as specified in Government Code Section 11346.3(c))*

3. Enter the total number of businesses impacted: ~211

Describe the types of businesses (Include nonprofits): Commercial Passenger Fishing Vessels (CPFVs) of the recreational fishing industry

Enter the number or percentage of total businesses impacted that are small businesses: ~100 %

4. Enter the number of businesses that will be created: 0 eliminated: 0

Explain: No impacts are anticipated on the creation of businesses as the infrastructure already exists to support the regulation.

5. Indicate the geographic extent of impacts: ☐ Statewide

☒ Local or regional (List areas): Coastal areas south of Monterey, CA.

6. Enter the number of jobs created: 0 and eliminated: 0

Describe the types of jobs or occupations impacted: There would be a slight increase in workload for CPFV crew/deckhands to fillet additional fish; however, this increased workload would not likely require additional deckhand positions.

7. Will the regulation affect the ability of California businesses to compete with other states by making it more costly to produce goods or services here?

☐ YES ☒ NO

If YES, explain briefly:



**ECONOMIC AND FISCAL IMPACT STATEMENT**SAM Section 6601-6616**(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

**ECONOMIC IMPACT STATEMENT (CONTINUED)****B. ESTIMATED COSTS** *Include calculations and assumptions in the rulemaking record.*

1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime? \$ 0 - \$108,233
- a. Initial costs for a small business: \$60-\$110\* Annual ongoing costs: \$60-\$110\* Years: 1
- b. Initial costs for a typical business: \$60-\$110\* Annual ongoing costs: \$60-\$110\* Years: 1
- c. Initial costs for an individual: \$0 - \$2/\$3 per fillet\*\* Annual ongoing costs: \$0 - \$10-\$15/trip\*\* Years: 1
- d. Describe other economic costs that may occur: \*CPFV businesses may choose to spend more on plastic bags for additional sheephead fillets and for the maintenance of fillet knives. \*\*See Addendum for explanation on potential voluntary individual costs.
2. If multiple industries are impacted, enter the share of total costs for each industry: N/A - The marine recreational fishing industry is the only impacted industry.
3. If the regulation imposes reporting requirements, enter the annual costs a typical business may incur to comply with these requirements. Include the dollar costs to do programming, record keeping, reporting, and other paperwork, whether or not the paperwork must be submitted. \$
4. Will this regulation directly impact housing costs? ☐ YES ☒ NO  
If YES, enter the annual dollar cost per housing unit: \$   
Number of units:
5. Are there comparable Federal regulations? ☐ YES ☒ NO  
Explain the need for State regulation given the existence or absence of Federal regulations: Angler and recreational fishing industry interests.  
Enter any additional costs to businesses and/or individuals that may be due to State - Federal differences: \$ 0

**C. ESTIMATED BENEFITS** *Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. Briefly summarize the benefits of the regulation, which may include among others, the health and welfare of California residents, worker safety and the State's environment: The primary benefits include angler satisfaction, increased revenue for CPFV businesses, the health and welfare of California residents, and the environment. See Addendum.
2. Are the benefits the result of: ☐ specific statutory requirements, or ☒ goals developed by the agency based on broad statutory authority?  
Explain: See Addendum
3. What are the total statewide benefits from this regulation over its lifetime? \$ See Addendum
4. Briefly describe any expansion of businesses currently doing business within the State of California that would result from this regulation: There would be a slight increase in workload for CPFV crew/deckhands to fillet additional fish; however, this increased workload would not likely require additional deckhand positions or an expansion of businesses.

**D. ALTERNATIVES TO THE REGULATION** *Include calculations and assumptions in the rulemaking record. Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. List alternatives considered and describe them below. If no alternatives were considered, explain why not: See ISOR

**ECONOMIC AND FISCAL IMPACT STATEMENT**SAM Section 6601-6616**(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

**ECONOMIC IMPACT STATEMENT (CONTINUED)**

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered:

Regulation: Benefit: \$ 69K - \$108K Cost: \$ 69K - \$108KAlternative 1: Benefit: \$ 69K - \$108K Cost: \$ same +>wasteAlternative 2: Benefit: \$ 0 Cost: \$ 0

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives:

Estimates are based on average annual California sheephead catch (2013 - 2017), which fluctuates depending on environmental, biological & economic factors. See Addendum

4. Rulemaking law requires agencies to consider performance standards as an alternative, if a regulation mandates the use of specific technologies or equipment, or prescribes specific actions or procedures. Were performance standards considered to lower compliance costs?

☐ YES☒ NOExplain: Specific minimum fillet length is necessary to accord with existing regulations on the minimum size limits for California sheephead.**E. MAJOR REGULATIONS** *Include calculations and assumptions in the rulemaking record.**California Environmental Protection Agency (Cal/EPA) boards, offices and departments are required to submit the following (per Health and Safety Code section 57005). Otherwise, skip to E4.*1. Will the estimated costs of this regulation to California business enterprises exceed \$10 million? ☐ YES ☐ NO*If YES, complete E2. and E3**If NO, skip to E4*

2. Briefly describe each alternative, or combination of alternatives, for which a cost-effectiveness analysis was performed:

Alternative 1: \_\_\_\_\_

Alternative 2: \_\_\_\_\_

*(Attach additional pages for other alternatives)*

3. For the regulation, and each alternative just described, enter the estimated total cost and overall cost-effectiveness ratio:

Regulation: Total Cost \$ \_\_\_\_\_ Cost-effectiveness ratio: \$ \_\_\_\_\_

Alternative 1: Total Cost \$ \_\_\_\_\_ Cost-effectiveness ratio: \$ \_\_\_\_\_

Alternative 2: Total Cost \$ \_\_\_\_\_ Cost-effectiveness ratio: \$ \_\_\_\_\_

4. Will the regulation subject to OAL review have an estimated economic impact to business enterprises and individuals located in or doing business in California exceeding \$50 million in any 12-month period between the date the major regulation is estimated to be filed with the Secretary of State through 12 months after the major regulation is estimated to be fully implemented?

☐ YES☒ NO*If YES, agencies are required to submit a Standardized Regulatory Impact Assessment (SRIA) as specified in Government Code Section 11346.3(c) and to include the SRIA in the Initial Statement of Reasons.*

5. Briefly describe the following:

The increase or decrease of investment in the State: \_\_\_\_\_

The incentive for innovation in products, materials or processes: \_\_\_\_\_

The benefits of the regulations, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, and the state's environment and quality of life, among any other benefits identified by the agency: \_\_\_\_\_



**ECONOMIC AND FISCAL IMPACT STATEMENT  
(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

**FISCAL IMPACT STATEMENT****A. FISCAL EFFECT ON LOCAL GOVERNMENT** *Indicate appropriate boxes 1 through 6 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

- ☐ 1. Additional expenditures in the current State Fiscal Year which are reimbursable by the State. (Approximate)  
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

\$ \_\_\_\_\_

- ☐ a. Funding provided in \_\_\_\_\_  
Budget Act of \_\_\_\_\_ or Chapter \_\_\_\_\_, Statutes of \_\_\_\_\_

- ☐ b. Funding will be requested in the Governor's Budget Act of \_\_\_\_\_  
Fiscal Year: \_\_\_\_\_

- ☐ 2. Additional expenditures in the current State Fiscal Year which are NOT reimbursable by the State. (Approximate)  
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

\$ \_\_\_\_\_

Check reason(s) this regulation is not reimbursable and provide the appropriate information:

- ☐ a. Implements the Federal mandate contained in \_\_\_\_\_
- ☐ b. Implements the court mandate set forth by the \_\_\_\_\_ Court.

Case of: \_\_\_\_\_ vs. \_\_\_\_\_

- ☐ c. Implements a mandate of the people of this State expressed in their approval of Proposition No. \_\_\_\_\_  
Date of Election: \_\_\_\_\_

- ☐ d. Issued only in response to a specific request from affected local entity(s).

Local entity(s) affected: \_\_\_\_\_

- ☐ e. Will be fully financed from the fees, revenue, etc. from: \_\_\_\_\_  
Authorized by Section: \_\_\_\_\_ of the \_\_\_\_\_ Code;

- ☐ f. Provides for savings to each affected unit of local government which will, at a minimum, offset any additional costs to each;

- ☐ g. Creates, eliminates, or changes the penalty for a new crime or infraction contained in \_\_\_\_\_

- ☐ 3. Annual Savings. (approximate)

\$ \_\_\_\_\_

- ☐ 4. No additional costs or savings. This regulation makes only technical, non-substantive or clarifying changes to current law regulations.

- ☒ 5. No fiscal impact exists. This regulation does not affect any local entity or program.

- ☐ 6. Other. Explain \_\_\_\_\_

**ECONOMIC AND FISCAL IMPACT STATEMENT  
(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

Instructions and Code Citations:

SAM Section 6601-6616**FISCAL IMPACT STATEMENT (CONTINUED)****B. FISCAL EFFECT ON STATE GOVERNMENT** *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

\$ \_\_\_\_\_

*It is anticipated that State agencies will:*☐ a. Absorb these additional costs within their existing budgets and resources.☐ b. Increase the currently authorized budget level for the \_\_\_\_\_ Fiscal Year☐ 2. Savings in the current State Fiscal Year. (Approximate)

\$ \_\_\_\_\_

☒ 3. No fiscal impact exists. This regulation does not affect any State agency or program.☐ 4. Other. Explain \_\_\_\_\_**C. FISCAL EFFECT ON FEDERAL FUNDING OF STATE PROGRAMS** *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

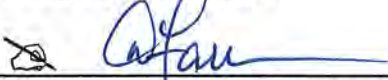
\$ \_\_\_\_\_

☐ 2. Savings in the current State Fiscal Year. (Approximate)

\$ \_\_\_\_\_

☒ 3. No fiscal impact exists. This regulation does not affect any federally funded State agency or program.☐ 4. Other. Explain \_\_\_\_\_

FISCAL OFFICER SIGNATURE



DATE

10/9/18

*The signature attests that the agency has completed the STD. 399 according to the instructions in SAM sections 6601-6616, and understands the impacts of the proposed rulemaking. State boards, offices, or departments not under an Agency Secretary must have the form signed by the highest ranking official in the organization.*

AGENCY SECRETARY



DATE

*Finance approval and signature is required when SAM sections 6601-6616 require completion of Fiscal Impact Statement in the STD. 399.*

DEPARTMENT OF FINANCE PROGRAM BUDGET MANAGER



DATE

Addendum to form STD. 399  
ECONOMIC AND FISCAL IMPACT STATEMENT

Re: Amend Subsection (b) of Section 27.65, Re: Filleting of Fish on Vessels;  
California Sheephead

ECONOMIC IMPACT STATEMENT

Section B. ESTIMATED COSTS

1. What are the total statewide dollar costs that businesses and individuals incur to comply with this regulation over its lifetime?

The calculations for initial and ongoing costs for an individual are based on the estimated price that will be charged by the Commercial Passenger Fishing Vessel (CPFV) for legal California sheephead to be filleted. It is important to note that this is an optional service, and individuals will only pay if they choose to have their California sheephead catch filleted by the deckhands on CPFV trips. Additionally, the fillet length regulation applies to all anglers. Anglers who fillet their legal California sheephead catch themselves, could do so at no cost. The maximum cost that an individual fishing aboard a CPFV would incur to have their California sheephead catch filleted is \$10 - \$15 per trip. This is based on the maximum bag limit of five California sheephead being filleted at \$2 - \$3 per fish. The annual ongoing costs are based on the average annual catch of California sheephead aboard CPFVs from 2013 – 2017 (Table 1). The lifetime (over one year) cost estimates are also used to estimate the total benefits from this regulation, as the fillet costs are paid directly to the CPFV businesses.

The costs for CPFVs to fillet sheephead would require spending on plastic bags and could involve spending on more knives and/or maintenance. The plastic bag costs to bag the 28,341 average annual number of retained sheephead at \$0.05 per bag, would be \$1,417 for all 211 vessels. Costs for each vessel would be about \$6.72 for additional plastic bags. With knife maintenance costs added, total per vessel costs are estimated to be \$60 - \$110 per year.

**Table 1.** The values used to estimate the total annual costs for the California sheephead fillet length regulation. Data from CPFV logs, 2013-2017.

Average annual number of retained California sheephead	Estimated total annual cost based (\$2 fillet) per fish	Estimated total annual cost based (\$3 fillet) per fish	Maximum individual angler costs per trip	Maximum individual CPFV costs for bags and knives	Lifetime (1-yr) costs for all CPFV anglers and CPFVs
28,341	\$56,682	\$85,023	\$10 - \$15	\$60 - \$110	\$69,342 - \$108,233



## C. ESTIMATED BENEFITS

2. Are the benefits the result of: ☐ specific statutory requirements, or ☒ goals developed by the agency based on broad statutory authority?

Explain: It is the policy of the state ensure the conservation, sustainable use, and where feasible, restoration of California's living marine resources of the benefit of all the citizens of the state. The objective of this policy shall be, among other things, to involve all interested parties, including, but not limited to, individuals from the sport and commercial fishing industries, aquaculture industries, coastal and ocean tourism and recreation industries, marine conservation organizations, local governments, marine scientists, and the public in marine living resource management decisions.

3. What are the total statewide benefits from this regulation over its lifetime?

The proposed regulation is in response to the sport fishing industry request and the recreational angling community that have been advocating a fillet length regulation for California sheephead since 2001. The benefits of the proposed regulation are primarily an increase in angler satisfaction for a modest charge (\$2 - \$3/fillet) that will also boost CPFV revenue.

The Commission also anticipates benefits to the health and welfare of California residents through the consumption of more California sheephead, a nutritious food. The proposed regulation also anticipates some benefit to the state's environment through the return of California sheephead carcasses to the marine ecosystem after it has been filleted. The proposed regulation does not have foreseeable benefits to worker safety.

## D. ALTERNATIVES TO THE REGULATION

1. Two alternatives to the recommended size of a 6.75-inch fillet are either a slightly smaller (6.5 inch) or larger (7.0 inch) fillet length. Both of these alternatives were rejected for the reasons set forth in the Initial Statement of Reasons. The economic impacts of both alternatives are expected to be the same as the economic impacts of the proposed regulation because the same number of fish at the same price per fillet would be expected to be filleted regardless of the prescribed fillet size. Alternative 1 listed in Section D.1. of the Std. 399 refers to both fillet-size alternatives.

Alternative 2 listed in Section D.1. of the Std. 399 refers to the no-change alternative which would leave existing regulations in place. The no-change alternative would incur no economic costs or benefits to individuals or the recreational fishing industry.

State of California  
Department of Fish and Wildlife

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FISH AND GAME  
COMMISSION

2018 OCT 10 AM 9:00

## Memorandum

Date: September 17, 2018

To: Valerie Termini  
Executive Director  
Fish and Game Commission

From: Craig Shuman, D. Env.  
Marine Regional Manager



Subject: **California Sheephead Fillet Length Regulation CEQA Overview**

California Sheephead is a popular recreational fishery in southern California. Almost all sport-caught finfishes with a minimum size limit also have a corresponding fillet length. However, a fillet length regulation for California Sheephead has not been created since the implementation of a minimum size limit [Title 14, California Code of Regulations Section 28.26(c)] in 2001. Since then, recreational anglers and the sport fishing industry including the Sportfishing Association of California (SAC) have been advocating for the implementation of a fillet length regulation permitting California Sheephead to be filleted at sea.

Amendment to Subsection (b) of Section 27.65 will allow legal-sized California Sheephead to be filleted on board vessels while at sea and brought ashore as fillets. This amendment anticipates a benefit to the marine environment through the return of California Sheephead carcasses to the marine ecosystem. Additionally, an increase in California Sheephead take is an unexpected and unlikely outcome, as the proposed regulation does not impact the bag limit or size of fish that can be legally retained. The purpose of this memo is to describe staff's analysis of use of a categorical exemption under the California Environmental Quality Act (CEQA).

### Categorical Exemption to Protect the Environment

The Commission adoption of these regulations is an action subject to CEQA. The review effort by Department staff pursuant to CEQA Guidelines section 15061 lead staff to conclude that adoption of the regulations would fall within Class 8 categorical exemptions (CEQA Guidelines section 15308). This exemption is related to agency actions to protect the environment. This regulatory proposal will allow anglers to fillet legal-sized California Sheephead aboard vessels while at sea and return the carcasses to the marine environment. This is more analogous to a natural process than discarding of carcasses on land. In staff's view, the Commission's adoption of regulations is an activity that is the proper subject of CEQA's Class 8 categorical exemption.

No Exceptions to Categorical Exemptions Apply

As to the exceptions to categorical exemptions set forth in CEQA Guidelines section 15300.2, including the prospect of unusual circumstances and related effects, the Department's review was guided by the California Supreme Court's recent decision in *Berkeley Hillside Preservation v. City of Berkeley*. Staff have reviewed all of the available information possessed by the Department relevant to the issue and does not believe adoption of the amendments to the existing regulations poses any unusual circumstances that would constitute an exception to the categorical exemptions set forth above. Compared to the activities that fall within Class 8 generally, which include natural resource enhancement activities such as the regulatory effort here, there is nothing unusual about the adopted amendments to the existing California Sheephead regulations.

In addition, even if there were unusual circumstances, no potentially significant effects on either a project-specific or cumulative basis are expected. The amendments to the regulations are intended to improve the management of California Sheephead and reduce the amount of California sheephead carcasses that would otherwise not be returned and ultimately recycled throughout the marine ecosystem. There is no anticipated change in the total amount of take. Even if there is an increase compared to current levels of take, California Sheephead is managed on a quota system which would cap any increase in take caused by this regulation at a level that prevents any impact on the overall Sheephead population. Therefore, the impact of this regulation, if any, would be a beneficial one through decreasing carcass disposal on land overall and keeping carcasses in the marine ecosystem.

Therefore, the Department does not believe that its reliance on the Class 8 categorical exemptions is precluded by the exceptions set forth in CEQA Guidelines section 15300.2.

If you have any questions regarding this item, please contact Miranda Haggerty, Environmental Scientist, at (562) 342-7162 or [Miranda.Haggerty@wildlife.ca.gov](mailto:Miranda.Haggerty@wildlife.ca.gov).

ec: Stafford Lehr, Deputy Director  
Wildlife and Fisheries Division  
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Craig Shuman, Regional Manager  
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[Craig.Shuman@wildlife.ca.gov](mailto:Craig.Shuman@wildlife.ca.gov)

Bob Puccinelli, Captain  
Law Enforcement Division  
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Valerie Termini, Executive Director  
Fish and Game Commission  
September 17, 2018  
Page 2

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# Notice of Exemption

## Appendix E

**To:** Office of Planning and Research  
P.O. Box 3044, Room 113  
Sacramento, CA 95812-3044

County Clerk

County of: \_\_\_\_\_

\_\_\_\_\_  
N/A

**From:** (Public Agency): CA Fish and Game Commission  
1416 9th Street, Room 1320  
\_\_\_\_\_  
Sacramento, CA 95814

(Address)

Project Title: Amend subsection (b) of Section 27.65, Re: Filleting of Fish on Vessels; CA sheephead

Project Applicant: N/A

Project Location - Specific:

Coastal areas south of Monterey, CA.

Project Location - City: N/A

Project Location - County: N/A

Description of Nature, Purpose and Beneficiaries of Project:

Amendment to subsection (b) of Section 27.65, Title 14, CCR adds a minimum fillet length regulation for California sheephead, where fillets must be a minimum of 6.75 inches in length and bear the entire skin intact. Environmental benefits of this regulation include returning CA sheephead carcasses to the marine ecosystem.

Name of Public Agency Approving Project: California Fish and Game Commission

Name of Person or Agency Carrying Out Project: California Department of Fish and Wildlife

Exempt Status: **(check one):**

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: Cal Code Regs., Title 14 §§ 15308
- ☐ Statutory Exemptions. State code number: \_\_\_\_\_

Reasons why project is exempt:  
See attached.

Lead Agency

Contact Person: \_\_\_\_\_ Area Code/Telephone/Extension: 916-653-4899

**If filed by applicant:**

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☐ Yes ☐ No

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Title: \_\_\_\_\_

☐ Signed by Lead Agency ☐ Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.  
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR: \_\_\_\_\_



**ATTACHMENT TO NOTICE OF EXEMPTION**  
**Adoption of Amendments to Subsection (b) of Section 27.65**  
**Title 14, CCR**

The California Fish and Game Commission (Commission) has taken final action under the Fish and Game Code and the Administrative Procedure Act (APA) with respect to the project mentioned on **[INSERT DATE]**. In taking its final action for the purposes of the California Environmental Quality Act (CEQA, Pub. Resources Code, § 21000 *et seq.*), the Commission adopted the amendment to subsection (b) of Section 27.65 relying on the categorical exemption for “Actions by Regulatory Agencies for Protection of the Environment” contained in CEQA Guidelines Section 15308. (Cal. Code Regs. tit. 14, §§ 15308.)

**Categorical Exemptions to Protect Natural Resources and the Environment**

In adopting the amendment to subsection (b) of Section 27.65, Title 14, California Code of Regulations, the Commission relied for purposes of CEQA on the Class 8 categorical exemption. In general, the exemption applies to agency actions to the environment. This amendment anticipates a benefit to the environment by returning California sheephead carcasses to the marine ecosystem. Therefore, the activity is one that is the proper subject of CEQA’s Class 8 categorical exemption.

2018 OCT -2 PM 3:31

## Memorandum

Date: September 27, 2018

To: Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Agenda Item for the October 2018, Fish and Game Commission Meeting**  
**Re: Request Readoption of §29.11 Purple Sea Urchin Recreational Bag Limit**  
**Emergency Regulation**

On April 18, 2018, the Fish and Game Commission (Commission) took action to raise the recreational bag limit for purple sea urchins taken off the Mendocino and Sonoma coast while skin diving or SCUBA diving. The action was taken in response to the dire condition of the northern California kelp forests and their resident abalone populations. The kelp forests have been slow to recover from the adverse conditions in the past five years in large part due to overgrazing by sea urchins, particularly by purple sea urchins. The problem of sea urchin overgrazing is further exacerbated by the loss of sea stars, an important predator of sea urchin, from the recent sea star wasting disease epidemic.

The emergency rule went into effect on May 10, 2018. Without a readoption, the rule will sunset on November 7, 2018. The current effort to explore the effect of higher urchin removal on the kelp forest led by the Department is still ongoing, and the study requires recreational divers to continue taking purple sea urchins at an elevated level. Department staff is currently working with Commission staff to develop a non-emergency rule similar in scope to the emergency regulation. It is crucial that recreational divers continue to harvest purple sea urchins and provide the Department with more up-to-date information on the effects of a higher take level during the standard rulemaking process.

Therefore, the Department requests that the Commission take action at its October 2018 meeting to readopt the emergency regulation to raise the recreational daily bag limit for purple sea urchin taken while skin-diving or SCUBA diving in Mendocino County and Sonoma County to 20 gallons per person per day.

Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission  
September 27, 2018  
Page 2

If you have any questions or need additional information, please contact Dr. Craig Shuman, Marine Regional Manager at (916) 445-6459. The public notice for this rulemaking should identify Environmental Scientist, Anthony Shiao as the Department's point of contact. His contact information is (805) 560-6056 or [Anthony.Shiao@Wildlife.ca.gov](mailto:Anthony.Shiao@Wildlife.ca.gov).

ec: Stafford Lehr, Deputy Director  
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CALIFORNIA FISH AND GAME COMMISSION  
STATEMENT OF PROPOSED EMERGENCY REGULATORY ACTION FOR  
READOPTATION OF EMERGENCY REGULATIONS

Readoption of Section 29.11  
Title 14, California Code of Regulations  
Re: Purple Sea Urchin

Date of Statement: September 18, 2018

**I. Emergency Regulation in Effect to Date**

The California Fish and Game Commission (Commission) approved an emergency rulemaking, Section 29.11, which became effective on May 10, 2018. The emergency addresses concerns over the impact of purple sea urchin overpopulation along the northern California coast. The emergency rulemaking increased the daily recreational bag limit for purple sea urchins taken through skin or scuba diving off the coast of Mendocino County and Sonoma County to 20 gallons. It also exempts the possession of purple sea urchin from any recreational possession limit.

The rule was originally adopted to catalyze a growing recreational interest in harvesting an overpopulated purple sea urchin and to help restore northern California kelp forests. Adopting Section 29.11 as an emergency rule was necessary due to the speed at which the purple sea urchin were negatively impacting the northern California kelp forests, the primary habitat of the red abalone.

The staff of the California Department of Fish and Wildlife (Department) has also been working with other stakeholders in several restoration efforts. Studies have so far been conducted in Ocean Cove, Sonoma County, and Albion Cove, Mendocino County. On both occasions, roughly 100 recreational divers participated and removed approximately 60,000 purple sea urchins from barren habitats. More studies have been planned, and Department staff will continue to track the effect of these removal events.

**II. Request for Approval of Readoption of Emergency Regulations**

The current emergency rule, Section 29.11, will expire on November 7, 2018, unless it is readopted for an additional 90 days through February 5, 2019. Department and Commission staff are currently working towards a standard rulemaking to adopt provisions similar in scope to the Emergency Section 29.11.

One of the primary goals of the restoration effort is to restore healthy stands of Bull kelp (*Nereocystis luetkeana*) and to study the species' response to urchin removal. Bull kelp is the dominant kelp species in northern California, and is a relatively slow-growing perennial species. Any restoration attempt would yield

observable results only after it has been conducted for over a year, within that time the Department will have the non-emergency Section 29.11 in place.

### **III. Statement of Facts Constituting the Need for Readoption of the Emergency Regulatory Action**

The recreational red abalone (*Haliotis rufescens*) fishery is one of California's most important fisheries, generating millions of dollars in tourism revenue for the northern California coast. Severe environmental conditions over the past several years have triggered a cascade of ecological changes that greatly impacted abalone populations and led to closure of the fishery.

The combination of unprecedented environmental and biological stressors has caused the bull kelp forest, the primary source of food for abalone, to shrink to only 10% of its historical coverage along the coasts of Sonoma and Mendocino counties. The loss of the kelp forest has led to widespread starvation of abalone. In 2016 and 2017, more than 25 percent of the abalones assessed (greater than 6,000 abalone per year) in the nine creel surveys at key fished sites in Sonoma and Mendocino counties had shrunken foot muscles due to starvation. Starved abalones have an increased chance of mortality and severely reduced reproduction further limiting their recovery.

Additionally, the kelp forest recovery is severely hindered due to the increased abundance of purple sea urchin (*Strongylocentrotus purpuratus*). Unlike abalone, sea urchins are generally resilient to food shortage and can survive longer without food, and grazing pressure from surviving sea urchins may prevent kelp recovery even as ocean conditions rebound. The urchin population boom is further exacerbated by the absence of important predatory sea stars (*Pisaster spp.*), which were severely impacted by the onset of the sea star wasting disease in 2013. With the sea star population still recovering from the epidemic, there will be little top-down control on the urchin population in northern coastal waters in the immediate future.

The most recent Department dive survey indicates that the abalone population in northern California remains in a persistently poor state. The poor state of the kelp forest ecosystem is further corroborated by anecdotal observations from recreational divers and commercial divers that have recently visited the area. Red abalone density at the Fort Ross survey site has dropped from 0.2 individuals/m<sup>2</sup> in 2017 to 0.08 individual/m<sup>2</sup> in 2018. Density at the Van Damme survey site only rose marginally from 0.14 individuals/m<sup>2</sup> in 2017 to 0.16 individual/m<sup>2</sup> in 2018, which is still less than 20% of the density of that site at the turn of the century.

#### **Habitat loss critically impacting red abalone has been documented along the north coast by Department staff:**

1. A dramatic decline in sea stars, important sea urchin predators, due to sea star wasting disease 2013-2015.



2. A dramatic decline (greater than 93 percent) of the kelp canopy in Sonoma and Mendocino counties in 2014.
3. A dramatic increase (greater than 60 times) in the density of purple sea urchins since 2014, increasing competition with abalone for food as well as suppressing recovery of kelp beds.
4. Persistent warm seawater conditions in Sonoma and Mendocino counties, particularly in 2014 and 2015.
5. Continued decline in overall average abalone densities in spite of significant take reductions implemented in 2014, ultimate closure of the fishery in 2018.

**Health and reproductive loss critically impacting red abalone has been documented along the north coast by Department staff:**

1. Visual abalone body health scores for abalone taken in the fishery during the spring of 2016 and 2017 show that more than 25 percent of abalone were shrunken in body mass at sites in northern California.
2. Reproductive condition index declined by greater than 50 percent at Van Damme State Park and Fort Ross in 2017, with increasing impact to reproduction evident in shrunken abalone (60 abalone per site).
3. Department staff and the public have observed weak abalone washed up on shore and easy to remove from the rocks as well as many new shells of all size classes, indicating increased natural mortality.
4. Low numbers of larval abalone observed in plankton surveys in Sonoma and Mendocino counties in 2015.
5. Small numbers of newly settled abalone observed in coralline-covered rock samples from Sonoma and Mendocino counties in 2015.
6. Few juvenile (less than 21 millimeters) red abalone observed in artificial reefs in Van Damme State Park since 2015.
7. Preliminary result from 2018 abalone survey shows that abalone densities continue to decline.

## **Prior Commission Actions**

In December 2017, the Commission closed the red abalone fishery for the 2018 season. Since then, the poor condition of the kelp forests has persisted. In August 2018, Commission and stakeholders agreed to potentially extend the closure by another two years. Recovery of the abalone fishery will not be possible without the prompt recovery of the bull kelp forests and the return of sufficient food to support abalone survival and reproduction.

Also in December 2017, the Commission considered alternatives to increasing or removing the take restrictions on the recreational purple sea urchin harvest, with the goal of supporting possible restoration of naturally occurring kelp along the environmentally impacted areas. In April 2018, the Commission adopted the emergency rule to significantly increase take of purple sea urchin and the emergency regulation went into effect on May 10, 2018.

## **Existence of an Emergency and Need for Immediate Action**

The Commission considered the following factors in determining whether an emergency exists: The magnitude of potential harm; the existence of a crisis situation; the immediacy of the need; and whether the anticipation of harm has a basis firmer than simple speculation. All available information points to a highly volatile and adverse condition for northern California kelp forests and the resident abalone populations, and extraordinary measures must continue to help restore important but vulnerable habitat.

## **Proposed Action by the Commission**

The Commission proposes the readoption of Section 29.11 that is the same as previously adopted.

## **IV. Impact of Regulatory Action**

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following determinations relative to the required statutory categories have been made:

- (a) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State: None.
- (b) Nondiscretionary Costs/Savings to Local Agencies: None.
- (c) Programs Mandated on Local Agencies or School Districts: None.
- (d) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code: None.

(e) Effect on Housing Costs: None.

## **V. Readoption Criteria**

### **1) Same as or Substantially Equivalent**

Pursuant to Government Code Section 11346.1(h), a readoption may be approved only if the text is “the same as or substantially equivalent to an emergency regulation previously adopted by that agency.” The language proposed for this rulemaking is the same as the language of the original emergency regulation.

### **2) Substantial Progress**

Government Code Section 11346.1(h) specifies “Readoption shall be permitted only if the agency has made substantial progress and proceeded with diligence to comply with subdivision (e) [of Sections 11346.2 through 11347.3, inclusive].” A rulemaking in compliance with these sections is currently ongoing and scheduled for public hearing and adoption in February, 2019

## **VI. Authority and Reference**

The Commission proposes this emergency action pursuant to the authority vested by sections 200, 205, and 399 of the Fish and Game Code and to implement, interpret, or make more specific sections 200, 205, and 399 of said code.

## **IV. Section 399 Finding**

Pursuant to Section 399 of the Fish and Game Code, the Commission finds that the adoption of this regulation is necessary for the immediate conservation, preservation, or protection of birds, mammals, reptiles, or fish (abalone).

## Informative Digest

The California Fish and Game Commission (Commission) adopted Section 29.11, Purple Sea Urchin, as an emergency rulemaking raising the recreational limit of purple sea urchins taken off the coast of Mendocino and Sonoma Counties, effective on May 10, 2018.

The emergency rule is due to expire on November 7, 2018, if a readoption is not filed. Readoption will extend the regulation for 90 days through February 5, 2019. This is necessary to ensure that the Department can continue to evaluate kelp forest ecosystem restoration efforts. The Department and Commission are currently working towards a standard rulemaking to adopt provisions similar in scope to the Emergency Section 29.11. A public hearing will be scheduled for February, 2019.

### Proposed Regulatory Action:

The regulation temporarily raises the daily bag limit for purple sea urchins taken while skin-diving or SCUBA diving in Sonoma and Mendocino counties to twenty (20) gallons. The proposal would also allow unlimited possession of recreationally taken purple sea urchin.

### Benefits of the Regulation to the State's Environment:

The Commission anticipates benefits to the State's environment by the sustainable management of California's ocean resources. The increased take for the recreational purple sea urchin harvest, with the goal of supporting restoration of naturally occurring kelp along the environmentally impacted areas, is critical to the recovery of the red abalone and the rest of the northern California kelp forest ecosystem.

### Consistency and Compatibility with Existing State Regulations:

The Legislature has delegated authority to the Commission to promulgate sport fishing regulations (Fish and Game Code, sections 200 and 205) as well as authority to promulgate corresponding emergency regulations as necessary (Fish and Game Code, Section 399). No other state agency has the authority to promulgate such regulations. The Commission has conducted a search of Title 14, California Code of Regulations (CCR) and determined that the proposed regulation is neither inconsistent nor incompatible with existing State regulations, and that the proposed regulation is consistent with other sport fishing regulations and marine protected area regulations in Title 14, CCR.

## **Emergency Regulatory Language**

Section 29.11, Title 14, CCR, is added as follows:

### **§ 29.11. Purple Sea Urchin**

(a) The daily bag limit for purple sea urchin taken while skin or SCUBA diving in state waters off Mendocino and Sonoma Counties is twenty (20) gallons.

(b) There is no possession limit for purple sea urchin.

Authority cited: Sections 200, 205 and 399, Fish and Game Code.

Reference: Sections 200, 205 and 399, Fish and Game Code



2018 AUG 21 PM 1:50

## Memorandum

Date: August 15, 2018

To: Valerie Termini  
Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Initial Statement of Reasons to Amend Subdivision (a) of Section 670.2, Title 14, California Code of Regulations, Re: Plants of California Declared to Be Endangered, Threatened, or Rare**

Attached please find the Initial Statement of Reasons (ISOR) and STD Form 399 to amend subdivision (a) of Section 670.2, Title 14, California Code of Regulations, Re: Plants of California Declared to Be Endangered, Threatened or Rare.

On April 19, 2018, at a noticed public meeting, the Fish and Game Commission (Commission) found that petitioned actions to list Lassics lupine (*Lupinus constancei*) and coast yellow leptosiphon (*Leptosiphon croceus*) as endangered under provisions of the California Endangered Species Act were warranted.

As required by Fish and Game Code Section 2075.5, subdivision (e)(2), the Commission must initiate proceedings in accordance with the Administrative Procedure Act to amend subdivision (a) of Section 670.2, Title 14, California Code of Regulations, to add Lassics lupine and coast yellow leptosiphon to the list of endangered plants. Please send the notice of proposed regulatory action and the ISOR to the Office of Administrative Law for publication in the California Regulatory Notice Register.

If you have any questions or need additional information, please contact Richard Macedo, Habitat Conservation Planning Branch Chief, at (916) 653-3861, or by e-mail [Richard.Macedo@wildlife.ca.gov](mailto:Richard.Macedo@wildlife.ca.gov). The public notice should identify Senior Environmental Scientist, Jeb Bjerke, as the Department's point of contact for this rulemaking. Mr. Bjerke can be reached at (916) 651-6594, or by e-mail [Jeb.Bjerke@wildlife.ca.gov](mailto:Jeb.Bjerke@wildlife.ca.gov).

Attachment

ec: Julie Yamamoto  
Acting Chief Deputy Director  
[Julie.Yamamoto@wildlife.ca.gov](mailto:Julie.Yamamoto@wildlife.ca.gov)

Valerie Termini, Executive Director  
Fish and Game Commission  
August 15, 2018  
Page 2

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Isabel Baer  
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STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
INITIAL STATEMENT OF REASONS FOR PROPOSED REGULATORY ACTION

Amend Section 670.2  
Title 14, California Code of Regulations  
Re: Plants of California Declared to Be Endangered, Threatened or Rare

- I. Date of Initial Statement of Reasons: August 15, 2018
- II. Dates and Locations of Scheduled Hearings:
- (a) Notice Hearing: Date: April 19, 2018  
Location: Ventura, CA
- (b) Adoption Hearing: October 18, 2018  
Location: Fresno
- III. Description of Regulatory Action:
- (a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

On April 19, 2018, at a noticed public meeting, the Fish and Game Commission ("Commission") found that the petitioned actions to list the Lassics lupine (*Lupinus constancei*) and coast yellow leptosiphon (*Leptosiphon croceus*) as endangered plants under provisions of the California Endangered Species Act (CESA) were warranted. The proposed regulation will add the Lassics lupine and the coast yellow leptosiphon to the list of endangered plants found in Section 670.2, Title 14, California Code of Regulations (CCR), in furtherance of the policy of the State.

The Legislature has declared that certain species of fish, wildlife, and plants are in danger of, or threatened with, extinction and that these species of fish, wildlife, and plants are of ecological, educational, historical, recreational, esthetic, economic, and scientific value to the people of this State, and the conservation, protection, and enhancement of these species and their habitat is of statewide concern. It is the policy of the State to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat. Section 670.2 provides a list, established by the Commission, of plants designated as endangered, threatened or rare in California. The Commission has the authority to add or remove species from the list if it finds, upon the receipt of sufficient scientific information, that the action is warranted.

LASSICS LUPINE

On July 19, 2016, the Commission received a petition from Mr. Dave Imper and Ms. Cynthia Elkins from the Center for Biological Diversity to list the Lassics lupine (*Lupinus constancei*) as endangered under provisions of the CESA. (Section 2050, Fish and Game Code, et seq.) The Commission transmitted the petition to the Department of Fish and Wildlife ("Department") for evaluation. (Cal. Reg. Notice Register 2016, No. 33-Z, p. 1463).

The Department prepared a petition evaluation report which it delivered to the Commission on

December 8, 2016. Based upon information contained in the petition and in relation to other relevant information, the Department recommended to the Commission that there was sufficient information to indicate that the petitioned action may be warranted and that the Commission should accept the petition. During a public meeting on February 8, 2017, the Commission heard the Department's presentation regarding the petition evaluation report and recommendation, as well as public testimony, and determined that the petition contained sufficient information to indicate that the petitioned action may be warranted. The Commission published its Notice of Findings in the California Regulatory Notice Register on February 24, 2017 designating Lassics lupine as a candidate species. (Cal. Reg. Notice Register 2017, No. 8-Z, p. 258; see also sections 2068, 2080, and 2085, Fish and Game Code)

Pursuant to Section 2074.6, Fish and Game Code, the Department then prepared a review of the status of Lassics lupine, based upon the best scientific information available to the Department. The Department submitted its "*Report to the Fish and Game Commission: Status Review of Lassics Lupine (Lupinus constancei)*" dated January 2018 to the Commission, including a recommendation based upon the best scientific information available that, in the Department's independent judgment, the petitioned action to list Lassics lupine as endangered under CESA is warranted.

On April 19, 2018, at a noticed public meeting, the Commission found that the petitioned action was warranted to list the Lassics lupine (*Lupinus constancei*).

The proposed amendment to Section 670.2 will add the Lassics lupine to the list of endangered plants in furtherance of the Commission's finding and the policy of the State.

#### COAST YELLOW LEPTOSIPHON

On May 25, 2016, the Commission received a petition from Ms. Toni Corelli, cosponsored by the California Native Plant Society (CNPS) seeking action to list coast yellow leptosiphon (*Leptosiphon croceus*) as an endangered plant under provisions of CESA. (Section 2050, Fish and Game Code, et seq.) The Commission transmitted the petition to the Department for evaluation. (Cal. Reg. Notice Register 2016, No. 24-Z, p. 1002.)

The Department prepared a petition evaluation report which it delivered to the Commission on September 26, 2016. Based upon information contained in the petition and in relation to other relevant information, the Department recommended to the Commission that there was sufficient information to indicate that the petitioned action may be warranted and that the Commission should accept the petition. During a public meeting on December 8, 2016, the Commission heard the Department's presentation regarding the petition evaluation report and recommendation and determined that the petition contained sufficient information to indicate that the petitioned action may be warranted. The Commission published its Notice of Findings in the California Regulatory Notice Register on December 23, 2016, designating coast yellow leptosiphon as a candidate species. (Cal. Reg. Notice Register 2016, No. 52-Z, p. 2197; see also sections 2068, 2080, and 2085, Fish and Game Code)

Pursuant to Section 2074.6, Fish and Game Code, the Department then prepared a review of the status of coast yellow leptosiphon, based upon the best scientific information available to the Department. The Department submitted its "*Report to the Fish and Game Commission: Status Review of Coast Yellow Leptosiphon (Leptosiphon croceus)*" dated December 2017 to

the Commission, including a recommendation based upon the best scientific information available that, in the Department's independent judgment, the petitioned action to list coast yellow leptosiphon as endangered under CESA is warranted.

On April 19, 2018, at a noticed public meeting, the Commission found that the petitioned action was warranted to list the coast yellow leptosiphon (*Leptosiphon croceus*).

The proposed amendment to Section 670.2 will add the coast yellow leptosiphon to the list of endangered plants in furtherance of the Commission's finding and the policy of the State.

(b) Authority and Reference Sections from Fish and Game Code for Regulation:

Authority: Sections 1904 and 2070, Fish and Game Code.

Reference: Sections 1755, 1904, 2062, 2067, 2070, 2072.7 and 2075.5, Fish and Game Code.

(c) Specific Technology or Equipment Required by Regulatory Change: None.

(d) Identification of Reports or Documents Supporting Regulation Change:

Petition to List the Lassics Lupine (*Lupinus constancei*) as Endangered under the California Endangered Species Act (Imper and Elkins, July 15, 2016).

Report to the Commission, "*Evaluation of the Petition from Mr. David Imper and Ms. Cynthia Elkins to List Lassics Lupine (*Lupinus constancei*) as an Endangered Species under the California Endangered Species Act*" (Department of Fish and Wildlife, December, 2016).

Report to the Commission, "*Status Review of Lassics Lupine (*Lupinus constancei*)*" (Department of Fish and Wildlife, January 2018).

Petition to list Coast Yellow Leptosiphon (*Leptosiphon croceus*) as Endangered under the California Endangered Species Act (Corelli, May 23, 2016).

Report to the Commission, "*Evaluation of the Petition from Ms. Toni Corelli and the California Native Plant Society to list Coast Yellow Leptosiphon (*Leptosiphon croceus*) as an Endangered Species under the California Endangered Species Act*" (Department of Fish and Wildlife, September 2016).

Report to the Commission, "*Status Review of Coast Yellow Leptosiphon (*Leptosiphon croceus*)*" (Department of Fish and Wildlife, December 2017).

(e) Efforts to Avoid Unnecessary Duplication or Conflicts with Federal Regulations:

The Commission has reviewed existing federal regulations contained in the Code of Federal Regulations addressing the same issues as the proposed regulations, including federal regulations governing the listing of species pursuant to the federal Endangered Species Act. Those regulations are found in Title 50 of the Code of Federal Regulations. Lassics lupine and coast yellow leptosiphon are not federally listed as threatened or



endangered (50 C.F.R. § 17.12). The Commission considered whether the proposed regulations duplicate or conflict with federal regulations and has concluded that the proposed regulations do not duplicate or conflict with the federal regulations because neither Lassics lupine nor coast yellow leptosiphon are protected as a threatened or endangered species under federal regulations.

(f) Public Discussions of Proposed Regulations Prior to Notice Publication:

The Commission received the Department's status review reports for Lassics lupine and coast yellow leptosiphon at its February 8, 2018 meeting, after which both status review reports were posted on the Commission and Department websites, and the Commission solicited public testimony at its April 19, 2018 meeting. As required by Fish and Game Code Section 2074.4, the Department notified interested parties of the proposed listings and requested data and comments on the petitions for Lassics lupine and coast yellow leptosiphon. Comments received are included in the status review reports referenced above under Section III (d).

IV. Description of Reasonable Alternatives to Regulatory Action:

(a) Alternatives to Regulation Change:

No alternatives were identified.

(b) No Change Alternative:

If the regulation change is not adopted, the Lassics lupine and coast yellow leptosiphon will have no formal State legal status, the positions they held prior to the filing of petitions to list these species. The no change alternative is inconsistent with the Commission's determinations at its April 19, 2018 meeting that listing the species as endangered is warranted pursuant to Fish and Game Code Section 2075.5.

(c) Consideration of Alternatives:

In view of information currently possessed, no reasonable alternative considered by the Commission or that has otherwise been identified and brought to the attention of the Commission would be more effective in carrying out the purposes for which the regulation is proposed, would be as effective and less burdensome to affected private persons than the proposed regulation, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

V. Mitigation Measures Required by Regulatory Action:

The proposed regulatory action will have no negative impact on the environment; therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action:

The potential for significant statewide adverse economic impacts that might result from the

proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made

- (a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

While the statutes of CESA do not specifically prohibit the consideration of economic impact in determining if listing is warranted, the Attorney General's Office has consistently advised the Commission that it should not consider economic impact in making a finding on listing. This is founded in the concept that CESA was drafted in the image of the federal Endangered Species Act. The federal act specifically prohibits consideration of economic impact during the listing process.

Listing under CESA is a two-stage process. During the first stage, the Commission must make a finding on whether or not the petitioned action is warranted. By statute, once the Commission has made a finding that the petitioned action is warranted, it must initiate a rulemaking process to make a corresponding regulatory change. To accomplish this second stage, the Commission follows the statutes of the Administrative Procedure Act (APA).

The provisions of the APA, specifically sections 11346.3 and 11346.5 of the Government Code, require an analysis of the economic impact of the proposed regulatory action. While Section 11346.3 requires an analysis of economic impact on businesses and private persons, it also contains a subdivision (a) which provides that agencies shall satisfy economic assessment requirements only to the extent that the requirements do not conflict with other State laws. In this regard, the provisions of CESA leading to a finding are in apparent conflict with Section 11346.3, which is activated by the rulemaking component of CESA.

Since the finding portion of CESA is silent to consideration of economic impact, it is possible that subdivision (a) of Section 11346.3 does not exclude the requirement for economic impact analysis. While the Commission does not believe this is the case, an abbreviated analysis of the likely economic impact of the proposed regulation change on businesses and private individuals is provided. The intent of this analysis is to provide disclosure, the basic premise of the APA process. The Commission believes that this analysis fully meets the intent and language of both statutory programs.

Designation of Lassics lupine and coast yellow leptosiphon as endangered will subject them to the provisions of CESA. CESA prohibits take and possession except as may be permitted by the Department, the Native Plant Protection Act, or the California Desert Native Plants Act.

Endangered status for Lassics lupine and coast yellow leptosiphon is not expected to result in any significant adverse economic effect on small business or significant cost to private persons or entities undertaking activities subject to the California Environmental Quality Act (CEQA). CEQA requires local governments and private applicants undertaking projects subject to CEQA to consider de facto endangered species to be subject to the same requirements under CEQA as though they were already listed by the Commission in Section 670.2 (CEQA Guidelines, Section 15380). Lassics lupine

and coast yellow leptosiphon have been recognized as rare plants in California for several decades, qualifying them for protection under CEQA Guidelines Section 15380. Required mitigation as a result of lead agency actions under CEQA, whether or not the species is listed by the Commission, may increase the cost of a project. Such costs may include, but are not limited to, purchasing off-site habitat, development and implementation of management plans, establishing new populations, installation of protective devices such as fencing, protection of additional habitat, and long-term monitoring of mitigation sites. Lead agencies may also require additional actions should the mitigation measures fail, resulting in added expenditures by the proponent. If the mitigation measures required by the CEQA lead agency do not minimize and fully mitigate to the standards of CESA, listing could increase business costs by requiring measures beyond those required by CEQA.

Although compliance with CESA could result in some additional costs for projects that affect State-listed species, the distributions of Lassics lupine and coast yellow leptosiphon are very restricted. Furthermore, Lassics lupine only occurs on land that is under federal jurisdiction. It is unlikely that there will be many significant actions affecting the species that will be subject to the application of CESA or CEQA. Coast yellow leptosiphon is restricted to one small population on a single sea bluff. Therefore, designating Lassics lupine and coast yellow leptosiphon as endangered is unlikely to have any significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states.

- (b) Impact on the Creation or Elimination of Jobs within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California, and Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:

The Commission does not anticipate that there will be any impacts on the creation or elimination of jobs, the creation of new business, the elimination of existing businesses or the expansion of businesses in California as a result of the designation of Lassics lupine and coast yellow leptosiphon as endangered. The entire distribution of Lassics lupine is limited to two small and remote populations located entirely on federal land managed by the U.S. Forest Service. Coast yellow leptosiphon is restricted to one small population on a single sea bluff. Because of these localized distributions, adding Lassics lupine and coast yellow leptosiphon to the list of endangered species under CESA is unlikely to affect the creation or elimination of jobs or businesses within the State as a whole.

The Commission does not anticipate benefits to the health and welfare of California residents or to worker safety.

The Commission anticipates benefits to the State's environment by the protection of Lassics lupine and coast yellow leptosiphon.

- (c) Cost Impacts on a Representative Private Person or Business:

Designation of Lassics lupine and coast yellow leptosiphon as endangered is unlikely to have any cost impacts on a representative private person or business. The entire

distribution of Lassics lupine is limited to two small and remote populations located entirely on federal land managed by the U.S. Forest Service. Because Lassics lupine only occurs on land that is under federal jurisdiction and coast yellow leptosiphon is restricted to one small population on a single sea bluff, it is unlikely that there will be any actions affecting the species that will be subject to the application of CESA or CEQA, or that will result in any cost impacts on a representative private person or business.

Furthermore, designation of threatened or endangered status, per se, would not necessarily result in any significant cost to private persons or entities undertaking activities that were subject to CEQA. CEQA presently requires private applicants undertaking projects subject to CEQA to consider *de facto* endangered (or threatened) and rare species to be subject to the same protections under CEQA as though they are already listed by the Commission in Section 670.2, Title 14, CCR. (CEQA Guidelines, Section 15380)

Any added costs should be more than offset by savings that would be realized through the informal consultation process available to private applicants under CESA. The process would allow conflicts to be resolved at an early stage in project planning and development, thereby avoiding conflicts later in the CEQA review process, which would be more costly and difficult to resolve.

- (d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State:

None.

- (e) Nondiscretionary Costs/Savings to Local Agencies:

None.

- (f) Programs mandated on Local Agencies or School Districts:

None.

- (g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code:

None.

- (h) Effect on Housing Costs:

None.

## VII. Economic Impact Assessment

The APA process requires an analysis of the proposed regulatory action's economic impact to assess that impact and avoid unnecessary or unreasonable regulatory requirements.

Government Code Section 11346.3, subdivision (a), provides that agencies shall satisfy economic assessment requirements only to the extent that the requirements do not conflict

with other State laws. Further, Section 11346.3, subdivision (e), states that “[r]egulatory impact analyses shall inform the agencies and the public of the economic consequences of regulatory choices, not reassess statutory policy.”

The Commission’s determination pursuant to CESA is governed by scientific considerations. “The Commission shall add or remove species from either [the endangered or threatened species] list if it finds, upon the receipt of sufficient scientific information pursuant to this article, that the action is warranted” (Section 2070, Fish and Game Code). The Commission shall list the subject species if it determines that its continued existence is in serious danger or is threatened by any one or any combination of enumerated biological factors. (Section 670.1(i)(1)(A), Title 14, CCR)

CESA is silent as to consideration of the economic impacts, and caselaw states that the Commission’s decisions are based on science, not economics. (*Natural Resources Defense Council v. Cal. Fish & Game Comm’n* (1994) 28 Cal.App.4th 1104, 1118, fn. 11.) This caselaw reflects the fact that CESA was drafted in the image of the federal Endangered Species Act. (*Id.* at 1117-1118.) The federal act specifically prohibits consideration of possible economic impacts during the listing or delisting process. (50 C.F.R. § 424.11(b))

The Legislature additionally declares a statutory policy in Section 2051, Fish and Game Code, that species of fish, wildlife and plants that are in danger of or threatened with extinction “are of ecological, educational, historical, recreational, esthetic, economic, and scientific value to the people of this state, and the conservation, protection, and enhancement of these species and their habitat is of statewide concern.”

The Commission’s findings pursuant to CESA are final decisions that are subject to judicial review. (Section 2076, Fish and Game Code.) Once the Commission has made a finding that the petitioned action is warranted, it must initiate a rulemaking process under the APA to make a corresponding regulatory change. (Section 2075.5(e)(2), Fish and Game Code.)

The following analysis of the likely economic impact of the proposed regulatory change on businesses and private individuals provides information to the public and agencies, as contemplated by Government Code Section 11346.3, subdivision (e), and serves a basic purpose of the APA process. (See *Tidewater Marine Western, Inc. v. Bradshaw* (1996) 14 Cal. 4th 557, 568.) Consistent with the APA, this analysis does not reassess the policy set forth in the Fish and Game Code and exercised by the Commission in its listing determination. The Commission believes that this analysis fully meets the intent and language of both statutory programs.

(a) Effects of the regulation on the creation or elimination of jobs within the State:

The Commission does not anticipate that there will be any impacts on the creation or elimination of jobs in California as a result of the designation of Lassics lupine and coast yellow leptosiphon as endangered. The entire distribution of Lassics lupine is limited to two small and remote populations located entirely on federal land managed by the U.S. Forest Service. Coast yellow leptosiphon is restricted to one small population on a single sea bluff. Because of these localized distributions, adding Lassics lupine and coast yellow leptosiphon to the list of endangered species under CESA is unlikely to affect the creation or elimination of jobs within the State as a whole.



Designation of Lassics lupine and coast yellow leptosiphon as an endangered species will subject them to the provisions of CESA. CESA prohibits the take, import, export, possession, purchase and sale of listed species except as provided by the Fish and Game Code. Lassics lupine and coast yellow leptosiphon have been subject to CESA's take prohibition since the Commission designated them as candidate species on February 24, 2017, and December 23, 2016, respectively.

Prior to listing, where an activity was a project subject to public agency review and approval under CEQA, impacts to Lassics lupine and coast yellow leptosiphon would have been evaluated as part of the CEQA lead agency's mandatory consideration of a project's impacts to biological resources. The intensity of that evaluation was heightened by the non-regulatory designation of Lassics lupine and coast yellow leptosiphon as California Rare Plant Rank 1B plants, and also heightened when Lassics lupine and coast yellow leptosiphon became candidates for listing.

Project costs arising from CEQA compliance typically include, but are not limited to, purchase of off-site habitat, development and implementation of management plans, establishment of new populations, protection of additional habitat, and long-term monitoring of mitigation sites. Public agencies might also require additional actions should the mitigation measures fail, resulting in added expenditures by the project proponent.

If a project subject to CEQA were to affect Lassics lupine or coast yellow leptosiphon, and the mitigation measures required by a public agency for purposes of CEQA did not minimize and fully mitigate project effects on the species as required for the Department to issue an incidental take permit pursuant to CESA, additional compliance costs may arise as a result of the listing. Because the take prohibition for both candidate and listed species is the same, such costs would not be increased by the act of adding Lassics lupine and coast yellow leptosiphon to the endangered species list.

- (b) Effects of the regulation on the creation of new businesses or the elimination of existing businesses within the State:

The Commission does not anticipate that there will be any impacts on the creation of new businesses or the elimination of existing businesses within the State as a result of the designation of Lassics lupine and coast yellow leptosiphon as endangered. The entire distribution of Lassics lupine is limited to two small and remote populations located entirely on federal land managed by the U.S. Forest Service. Coast yellow leptosiphon is restricted to one small population on a single sea bluff. Because of these localized distributions, adding Lassics lupine and coast yellow leptosiphon to the list of endangered species under CESA is unlikely to have any effect on the creation of new businesses or the elimination of existing businesses within the State.

- (c) Effects of the regulation on the expansion of businesses currently doing business within the State:

The Commission does not anticipate that there will be any impacts on the expansion of businesses currently doing business within the State as a result of the designation of Lassics lupine and coast yellow leptosiphon as endangered. The distributions of Lassics

lupine and coast yellow leptosiphon are highly restricted. Because of this localized distribution, adding Lassics lupine and coast yellow leptosiphon to the list of endangered species under CESA is unlikely to have any effect on the expansion of businesses currently doing business within the State.

(d) Benefits of the regulation to the health and welfare of California residents:

Lassics lupine and coast yellow leptosiphon are of ecological, educational, historical, recreational, esthetic, cultural, and scientific value to the people of this State. The conservation, protection, and enhancement of the species and their habitat will benefit the health and welfare of California residents.

(e) Benefits of the regulation to worker safety:

The proposed regulation will not affect worker safety because it does not address working conditions.

(f) Benefits of the regulation to the State's environment:

As discussed above, the Legislature has identified the conservation, protection and enhancement of endangered species and their habitat as an issue of statewide concern and has recognized these species' value, including their economic value. Improved conditions in Lassics lupine and coast yellow leptosiphon habitat resulting from take avoidance and species enhancement efforts could also be expected to result in improved conditions for other species that are critical to the economy, as well as improvements to water quality and other environmental resources.

## Informative Digest/Policy Statement Overview

Section 670.2, Title 14, California Code of Regulations (CCR), provides a list, established by the California Fish and Game Commission (Commission), of plants designated as endangered, threatened or rare in California. The Commission has the authority to add or remove species from this list if it finds that the action is warranted.

As required by Fish and Game Code Section 2075.5, subdivision (e)(2), the Commission must initiate proceedings in accordance with the Administrative Procedure Act to amend Section 670.2 to add Lassics lupine (*Lupinus constancei*) and coast yellow leptosiphon (*Leptosiphon croceus*) to the list of endangered plants.

In making the recommendation to list Lassics lupine pursuant to the California Endangered Species Act, the California Department of Fish and Wildlife (Department) identified the following primary threats: (1) predation and herbivory; (2) climate change; (3) vegetation encroachment; (4) the vulnerability of small populations; and (5) fire. More detail about the current status of Lassics lupine can be found in the Report to the Fish and Game Commission, "Status Review of Lassics lupine (*Lupinus constancei*)" (Department of Fish and Wildlife, January 2018).

In making the recommendation to list coast yellow leptosiphon pursuant to the California Endangered Species Act, the Department identified the following primary threats: 1) recent and ongoing development and land-use changes; 2) impacts from invasive plant species; 3) erosion; 4) human activities such as trampling; and 5) the vulnerability of small populations. More detail about the current status of coast yellow leptosiphon can be found in the Report to the Fish and Game Commission, "Status Review of Coast Yellow Leptosiphon (*Leptosiphon croceus*)" (Department of Fish and Wildlife, December 2017).

The proposed regulation will benefit the environment by protecting Lassics lupine and coast yellow leptosiphon as endangered plants.

Commission staff has searched the California Code of Regulations and has found that the proposed regulation is neither inconsistent nor incompatible with existing State regulations. No other State entity has the authority to list threatened and endangered species.

## REGULATORY LANGUAGE

Section 670.2, Title 14, California Code of Regulations is amended to read:

### **§670.2. Plants of California Declared to Be Endangered, Threatened, or Rare.**

The following species, subspecies and varieties of California native plants are hereby declared to be endangered, threatened (as defined by Section 2067 of the Fish and Game Code) or rare (as defined by Section 1901 of the Fish and Game Code), as indicated:

(a) Endangered:

. . . [No changes to subsections (a)(1) through (a)(14)]

(15) Fabaceae (Legume Family)

(A) *Acmispon argophyllus* var. *adsurgens* (San Clemente Island bird's-foot trefoil)

(B) *Acmispon argophyllus* var. *niveus* (Santa Cruz Island bird's-foot trefoil)

(C) *Acmispon dendroideus* var. *traskiae* (San Clemente Island lotus)

(D) *Astragalus agnicidus* (Humboldt County milkvetch)

(E) *Astragalus lentiginosus* var. *sesquimetralis* (Sodaville milkvetch)

(F) *Astragalus magdalenae* var. *peirsonii* (Peirson's milkvetch)

(G) *Astragalus pycnostachyus* var. *lanosissimus* (Ventura Marsh milkvetch)

(H) *Astragalus tener* var. *titi* (coastal dunes milkvetch)

(I) *Lupinus constancei* (Lassics lupine)

~~(I)-(J)~~ *Lupinus nipomensis* (Nipomo Mesa lupine)

~~(J)-(K)~~ *Lupinus tidestromii* var. *tidestromii* (Tidestrom's lupine)

~~(K)-(L)~~ *Trifolium trichocalyx* (Monterey clover)

. . . [No changes to subsections (a)(16) through (a)(24)]

(25) Polemoniaceae (Phlox Family)

(A) *Eriastrum densifolium* ssp. *sanctorum* (Santa Ana River woollystar)

(B) *Leptosiphon croceus* (coast yellow leptosiphon)

~~(B)-(C)~~ *Navarretia leucocephala* ssp. *plieantha* (many-flowered navarretia)

~~(C)-(D)~~ *Phlox hirsuta* (Yreka phlox)

. . . [No changes to subsections (a)(26) through (c)]

NOTE: Authority Cited: Sections 1904 and 2070, Fish and Game Code. Reference: Sections 1755, 1904, 2062, 2067, 2070, 2072.7 and 2075.5, Fish a

**ECONOMIC AND FISCAL IMPACT STATEMENT  
(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

**ECONOMIC IMPACT STATEMENT**

DEPARTMENT NAME Fish and Game Commission	CONTACT PERSON Margaret.Duncan	EMAIL ADDRESS @wildlife.ca.gov	TELEPHONE NUMBER 916-653-4676
DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400 Amend §670.2, Title 14, CCR Re: Plants of California Declared to be Endangered, Threatened or Rare			NOTICE FILE NUMBER Z

**A. ESTIMATED PRIVATE SECTOR COST IMPACTS** *Include calculations and assumptions in the rulemaking record.*

1. Check the appropriate box(es) below to indicate whether this regulation:

- |  |   |
|--|---|
| <input type="checkbox"/> a. Impacts business and/or employees  | <input type="checkbox"/> e. Imposes reporting requirements                |
| <input type="checkbox"/> b. Impacts small businesses           | <input type="checkbox"/> f. Imposes prescriptive instead of performance   |
| <input type="checkbox"/> c. Impacts jobs or occupations        | <input type="checkbox"/> g. Impacts individuals                           |
| <input type="checkbox"/> d. Impacts California competitiveness | <input checked="" type="checkbox"/> h. None of the above (Explain below): |

CESA listing for 2 species with small, remote populations& insignificant costs*If any box in Items 1 a through g is checked, complete this Economic Impact Statement.**If box in Item 1.h. is checked, complete the Fiscal Impact Statement as appropriate.*2. The \_\_\_\_\_ estimates that the economic impact of this regulation (which includes the fiscal impact) is:  
(Agency/Department)

- ☐ Below \$10 million
- ☐ Between \$10 and \$25 million
- ☐ Between \$25 and \$50 million
- ☐ Over \$50 million *[If the economic impact is over \$50 million, agencies are required to submit a Standardized Regulatory Impact Assessment as specified in Government Code Section 11346.3(c)]*

3. Enter the total number of businesses impacted: \_\_\_\_\_

Describe the types of businesses (Include nonprofits): \_\_\_\_\_

Enter the number or percentage of total  
businesses impacted that are small businesses: \_\_\_\_\_

4. Enter the number of businesses that will be created: \_\_\_\_\_ eliminated: \_\_\_\_\_

Explain: \_\_\_\_\_

5. Indicate the geographic extent of impacts: ☐ Statewide  
☐ Local or regional (List areas): \_\_\_\_\_

6. Enter the number of jobs created: \_\_\_\_\_ and eliminated: \_\_\_\_\_

Describe the types of jobs or occupations impacted: \_\_\_\_\_

7. Will the regulation affect the ability of California businesses to compete with  
other states by making it more costly to produce goods or services here? ☐ YES ☐ NO

If YES, explain briefly: \_\_\_\_\_



**ECONOMIC AND FISCAL IMPACT STATEMENT  
(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

**ECONOMIC IMPACT STATEMENT (CONTINUED)****B. ESTIMATED COSTS** *Include calculations and assumptions in the rulemaking record.*

1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime? \$ \_\_\_\_\_
- a. Initial costs for a small business: \$ \_\_\_\_\_ Annual ongoing costs: \$ \_\_\_\_\_ Years: \_\_\_\_\_
- b. Initial costs for a typical business: \$ \_\_\_\_\_ Annual ongoing costs: \$ \_\_\_\_\_ Years: \_\_\_\_\_
- c. Initial costs for an individual: \$ \_\_\_\_\_ Annual ongoing costs: \$ \_\_\_\_\_ Years: \_\_\_\_\_
- d. Describe other economic costs that may occur: \_\_\_\_\_

2. If multiple industries are impacted, enter the share of total costs for each industry: \_\_\_\_\_

3. If the regulation imposes reporting requirements, enter the annual costs a typical business may incur to comply with these requirements. *Include the dollar costs to do programming, record keeping, reporting, and other paperwork, whether or not the paperwork must be submitted.* \$ \_\_\_\_\_

4. Will this regulation directly impact housing costs? ☐ YES ☐ NO

If YES, enter the annual dollar cost per housing unit: \$ \_\_\_\_\_

Number of units: \_\_\_\_\_

5. Are there comparable Federal regulations? ☐ YES ☐ NO

Explain the need for State regulation given the existence or absence of Federal regulations: \_\_\_\_\_

Enter any additional costs to businesses and/or individuals that may be due to State - Federal differences: \$ \_\_\_\_\_

**C. ESTIMATED BENEFITS** *Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. Briefly summarize the benefits of the regulation, which may include among others, the health and welfare of California residents, worker safety and the State's environment: \_\_\_\_\_

2. Are the benefits the result of: ☐ specific statutory requirements, or ☐ goals developed by the agency based on broad statutory authority?

Explain: \_\_\_\_\_

3. What are the total statewide benefits from this regulation over its lifetime? \$ \_\_\_\_\_

4. Briefly describe any expansion of businesses currently doing business within the State of California that would result from this regulation: \_\_\_\_\_

**D. ALTERNATIVES TO THE REGULATION** *Include calculations and assumptions in the rulemaking record. Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. List alternatives considered and describe them below. If no alternatives were considered, explain why not: \_\_\_\_\_

**ECONOMIC AND FISCAL IMPACT STATEMENT****(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

**ECONOMIC IMPACT STATEMENT (CONTINUED)**

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered:

Regulation: Benefit: \$ \_\_\_\_\_ Cost: \$ \_\_\_\_\_

Alternative 1: Benefit: \$ \_\_\_\_\_ Cost: \$ \_\_\_\_\_

Alternative 2: Benefit: \$ \_\_\_\_\_ Cost: \$ \_\_\_\_\_

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives: \_\_\_\_\_

4. Rulemaking law requires agencies to consider performance standards as an alternative, if a regulation mandates the use of specific technologies or equipment, or prescribes specific actions or procedures. Were performance standards considered to lower compliance costs? ☐ YES ☐ NO

Explain: \_\_\_\_\_

**E. MAJOR REGULATIONS** *Include calculations and assumptions in the rulemaking record.**California Environmental Protection Agency (Cal/EPA) boards, offices and departments are required to submit the following (per Health and Safety Code section 57005). Otherwise, skip to E4.*1. Will the estimated costs of this regulation to California business enterprises exceed \$10 million? ☐ YES ☐ NO*If YES, complete E2. and E3**If NO, skip to E4*

2. Briefly describe each alternative, or combination of alternatives, for which a cost-effectiveness analysis was performed:

Alternative 1: \_\_\_\_\_

Alternative 2: \_\_\_\_\_

*(Attach additional pages for other alternatives)*

3. For the regulation, and each alternative just described, enter the estimated total cost and overall cost-effectiveness ratio:

Regulation: Total Cost \$ \_\_\_\_\_ Cost-effectiveness ratio: \$ \_\_\_\_\_

Alternative 1: Total Cost \$ \_\_\_\_\_ Cost-effectiveness ratio: \$ \_\_\_\_\_

Alternative 2: Total Cost \$ \_\_\_\_\_ Cost-effectiveness ratio: \$ \_\_\_\_\_

4. Will the regulation subject to OAL review have an estimated economic impact to business enterprises and individuals located in or doing business in California exceeding \$50 million in any 12-month period between the date the major regulation is estimated to be filed with the Secretary of State through 12 months after the major regulation is estimated to be fully implemented?

☐ YES ☒ NO*If YES, agencies are required to submit a Standardized Regulatory Impact Assessment (SRIA) as specified in Government Code Section 11346.3(c) and to include the SRIA in the Initial Statement of Reasons.*

5. Briefly describe the following:

The increase or decrease of investment in the State: \_\_\_\_\_

The incentive for innovation in products, materials or processes: \_\_\_\_\_

The benefits of the regulations, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, and the state's environment and quality of life, among any other benefits identified by the agency: \_\_\_\_\_



**ECONOMIC AND FISCAL IMPACT STATEMENT  
(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

**FISCAL IMPACT STATEMENT****A. FISCAL EFFECT ON LOCAL GOVERNMENT** *Indicate appropriate boxes 1 through 6 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

- ☐ 1. Additional expenditures in the current State Fiscal Year which are reimbursable by the State. (Approximate)  
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

\$ \_\_\_\_\_

- ☐ a. Funding provided in \_\_\_\_\_  
Budget Act of \_\_\_\_\_ or Chapter \_\_\_\_\_, Statutes of \_\_\_\_\_

- ☐ b. Funding will be requested in the Governor's Budget Act of \_\_\_\_\_  
Fiscal Year: \_\_\_\_\_

- ☐ 2. Additional expenditures in the current State Fiscal Year which are NOT reimbursable by the State. (Approximate)  
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

\$ \_\_\_\_\_

*Check reason(s) this regulation is not reimbursable and provide the appropriate information:*

- ☐ a. Implements the Federal mandate contained in \_\_\_\_\_
- ☐ b. Implements the court mandate set forth by the \_\_\_\_\_ Court.

Case of: \_\_\_\_\_ vs. \_\_\_\_\_

- ☐ c. Implements a mandate of the people of this State expressed in their approval of Proposition No. \_\_\_\_\_  
Date of Election: \_\_\_\_\_

- ☐ d. Issued only in response to a specific request from affected local entity(s).

Local entity(s) affected: \_\_\_\_\_  
\_\_\_\_\_

- ☐ e. Will be fully financed from the fees, revenue, etc. from: \_\_\_\_\_

Authorized by Section: \_\_\_\_\_ of the \_\_\_\_\_ Code;

- ☐ f. Provides for savings to each affected unit of local government which will, at a minimum, offset any additional costs to each;

- ☐ g. Creates, eliminates, or changes the penalty for a new crime or infraction contained in \_\_\_\_\_

- ☐ 3. Annual Savings. (approximate)

\$ \_\_\_\_\_

- ☐ 4. No additional costs or savings. This regulation makes only technical, non-substantive or clarifying changes to current law regulations.

- ☒ 5. No fiscal impact exists. This regulation does not affect any local entity or program.

- ☐ 6. Other. Explain \_\_\_\_\_  
\_\_\_\_\_

**ECONOMIC AND FISCAL IMPACT STATEMENT  
(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

Instructions and Code Citations:

SAM Section 6601-6616**FISCAL IMPACT STATEMENT (CONTINUED)****B. FISCAL EFFECT ON STATE GOVERNMENT** *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

\$ \_\_\_\_\_

*It is anticipated that State agencies will:*☐ a. Absorb these additional costs within their existing budgets and resources.☐ b. Increase the currently authorized budget level for the \_\_\_\_\_ Fiscal Year☐ 2. Savings in the current State Fiscal Year. (Approximate)

\$ \_\_\_\_\_

☒ 3. No fiscal impact exists. This regulation does not affect any State agency or program.☐ 4. Other. Explain \_\_\_\_\_**C. FISCAL EFFECT ON FEDERAL FUNDING OF STATE PROGRAMS** *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

\$ \_\_\_\_\_

☐ 2. Savings in the current State Fiscal Year. (Approximate)

\$ \_\_\_\_\_

☒ 3. No fiscal impact exists. This regulation does not affect any federally funded State agency or program.☐ 4. Other. Explain \_\_\_\_\_

FISCAL OFFICER SIGNATURE

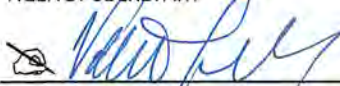


DATE

8/8/18

*The signature attests that the agency has completed the STD. 399 according to the instructions in SAM sections 6601-6616, and understands the impacts of the proposed rulemaking. State boards, offices, or departments not under an Agency Secretary must have the form signed by the highest ranking official in the organization.*

AGENCY SECRETARY



DATE

8/20/18

*Finance approval and signature is required when SAM sections 6601-6616 require completion of Fiscal Impact Statement in the STD. 399.*

DEPARTMENT OF FINANCE PROGRAM BUDGET MANAGER



DATE

**Commissioners**  
**Eric Sklar**, President  
Saint Helena

**Anthony C. Williams**, Vice President  
Huntington Beach

**Jacque Hostler-Carmesin**, Member  
McKinleyville

**Russell E. Burns**, Member  
Napa

**Peter S. Silva**, Member  
Jamul

STATE OF CALIFORNIA  
Edmund G. Brown Jr., Governor

## Fish and Game Commission



*Wildlife Heritage and Conservation*  
*Since 1870*

**Valerie Termini, Executive Director**  
P.O. Box 944209  
Sacramento, CA 94244-2090  
(916) 653-4899  
fgc@fgc.ca.gov  
www.fgc.ca.gov

June 11, 2018

TO ALL INTERESTED AND AFFECTED PARTIES:

This is to provide you with a continuation notice of proposed regulatory action relative to sections 42, 43, 651, and 703, Title 14, California Code of Regulations, relating to commercial use and possession of native rattlesnakes for biomedical and therapeutic purposes.

During the regulatory process to add and amend the sections noted above, changes were made to the originally proposed language. Because the modified proposed regulations are different from, yet sufficiently related to, the originally proposed regulations, the Administrative Procedure Act requires that these changes be made available to you for a 15-day written comment period. Comments on the revised proposed regulations will be accepted from June 11, 2018, through June 26, 2018.

Attached for your review is the Amended Initial Statement of Reasons, with changes shown in bold font, and the modified proposed regulatory language, with changes shown in double underline/strikeout format.

The original notice, Initial Statement of Reasons for Regulatory Action, and originally proposed regulations are posted on the Fish and Game Commission's (Commission) website at <http://www.fgc.ca.gov/regulations/2017/index.aspx#42>.

**Written comments on the modified proposed regulations must be received in the Commission office by 5:00 p.m. on June 26, 2018.** Comments may be submitted to the Commission at the address listed above or by email to [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).

Sincerely,

Rick Pimentel  
Associate Governmental Program Analyst

Attachments



STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
**AMENDED INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION**  
(Pre-publication of Notice Statement)

Add Section 42 and subsection (a)(2) of Section 703, and  
Amend subsection (c) of Section 43 and subsection (a) of Section 651,  
Title 14, California Code of Regulations  
Re: Commercial Use and Possession of Native Rattlesnakes  
for Biomedical and Therapeutic Purposes

I. Date of Initial Statement of Reasons: April 12, 2017

**Date of Amended Initial Statement of Reasons: May 25, 2018**

II. Dates and Locations of Scheduled Hearings:

(a) Notice Hearing: Date: June 21, 2017  
Location: Smith River

(b) Discussion and Adoption Hearing: Date: October 11, 2017  
Location: Atascadero

III. Description of Regulatory Action:

(a) Statement of Specific Purpose of Regulation Change and Factual Basis  
for Determining that Regulation Change is Reasonably Necessary:

The Fish and Game Commission (Commission) received a petition in 2015 to amend existing regulations or adopt new regulations that would allow for the commercial use of native rattlesnakes to develop antivenom, vaccines, and other therapeutic agents. The Commission approved the petition request at its February 11, 2016 meeting in Sacramento and forwarded it to the Department of Fish and Wildlife (Department) for evaluation.

Department staff met with the petitioners during 2016 to gather additional information. The petitioners had initially proposed using “nuisance” snakes collected by rattlesnake removal businesses for this purpose, as well as raising the possession limit on native rattlesnakes for aversion trainers. However, those proposals would have required additional public outreach and scoping of affected businesses that would have greatly delayed the development of the new regulations. Therefore, with the petitioners’ consent, the Department narrowed the scope of the regulatory proposal to address only commercialized use of native rattlesnakes for venom extraction in conjunction with research and

development of biomedical and therapeutic agents. In addition, the Department added propagation of native rattlesnakes at the request of the petitioners.

The Commission has the statutory authority to adopt regulations for the commercial use of native reptiles pursuant to Fish and Game Code Section 5061. Currently, there are only two authorized commercial activities in California: captive propagation and sale of three species of snakes, which is allowed under Section 43, and wild collection and sale of native reptiles by biological supply houses, which is allowed under Section 651.

According to the California Poison Control System, over 300 rattlesnake bites are reported in the state each year. According to the National Institutes of Health, approximately 7,000-8,000 people receive venomous bites in the United States and about 5 people die. While exact numbers are unavailable, it has been estimated that well over 100,000 domesticated animals are bitten annually in the United States by venomous snakes, sometimes resulting in death. Rattlesnake bites are known to cause serious tissue, muscle, liver, and neurological damage. The composition of rattlesnake venom differs by species, and in some cases by location within the species. For example, Southern Pacific Rattlesnake (*Crotalus oreganus helleri*) venom has unique properties that differ across its range. Antivenom and vaccines that are derived from different species of rattlesnakes than the species that inflicted the bite are less effective, and sometimes not effective at all, in treatment of the bite. The currently available rattlesnake vaccine for domestic animals is derived from Western Diamondback Rattlesnake (*Crotalus atrox*) venom. A study in the American Journal of Veterinary Medicine (Cates et al. 2015) found this vaccine improved survival rate and survival time after envenomation from Western Diamondback Rattlesnakes. However, while it may offer some limited protection against Northern Pacific Rattlesnake (*Crotalus oreganus oreganus*) venom, it did not provide significant protection against Southern Pacific Rattlesnake venom. **Under current laws and regulations, the only way antivenom, vaccines, and other therapeutic agents can be derived from native rattlesnakes in California is through non-commercial research and development with a valid Scientific Collecting Permit pursuant to Section 650. However, biological supply houses can collect native rattlesnakes and sell them to out-of-state scientific and educational facilities that develop and sell these products.**

Amendments to existing commercially authorized activities pursuant to Sections 43 and 651 are impractical. Section 43 pertains to the production of captive born reptiles for the purpose of selling them in the pet trade and has no application to the commercialization of rattlesnake venom or products derived from venom. Section 651 is restricted to the sale of native reptiles and amphibians collected from the wild to scientific and educational institutions by owners of biological supply houses that have been issued a permit from the Department. Therefore,

to advance public and domestic animal health and safety, a new regulation is being proposed (Section 42) to address the need for regionally specific antivenom, vaccines, and other venom-derived therapeutic agents, that are effective against the bites from native rattlesnakes and provide other biomedical benefits. This new regulation would authorize commercial development of these products by California businesses under a permit issued by the Department.

### **Existing Regulations**

The text of Section 42 was repealed in January 2002, but the title and note are still listed in Title 14, California Code of Regulations (CCR). Section 43 contains regulations for the captive propagation of native reptiles and sale of three species of native snakes for the pet trade. Section 651 regulations specify the wild collection and sale of native reptiles by biological supply houses. **Section 703 contains the applications, forms and fees associated with Department-issued permits for restricted species, non-detrimental transgenic aquatic animals and falconry.**

### **Proposed Regulations**

The proposed new Section 42 regulation will allow California businesses to develop and sell regionally specific antivenom, vaccines, and other therapeutic agents derived from native rattlesnake venom. These products would benefit livestock, pet, and eventually, human health. The new permit will allow:

1. Businesses to maintain live native rattlesnake species for the purposes of venom extraction and the development and sale of therapeutic products derived from native rattlesnake venom,
2. Businesses to develop and sell therapeutic products derived from commercially obtained native rattlesnake venom, **and**
3. **Businesses to purchase native rattlesnakes from a biological supply house for the purpose of developing and selling biomedical and therapeutic products.**

In addition, it is necessary to make minor amendments to sections 43, 651, and 703 to provide consistency and clarity with the proposed Section 42.

### Section 42

Subsection (a) of Section 42 details the activities allowed under a **Commercial Native Rattlesnake Permit** issued by the Department. This subsection is necessary to provide the context for the purpose of the regulation and to specify

the activities that would be authorized under a permit issued pursuant to the regulation.

Subsection (b) of Section 42 specifies that this regulation does not supersede any other federal, state, or local laws regulating or prohibiting possession of native rattlesnakes or the activities authorized under a **Commercial Native Rattlesnake Permit**. This subsection is necessary to ensure consistency with other laws and to clarify that this regulation does not supplant existing or future restrictions on the possession and use of native rattlesnakes by other jurisdictions.

Subsection (c) of Section 42 lists the species of native rattlesnakes that may be used under this regulation. This subsection is necessary to make it explicit that all currently recognized species of native rattlesnakes, their subspecies and taxonomic successors, are allowed to be used for the purposes of this regulation with the exception of the Red Diamond Rattlesnake (*Crotalus ruber*), which is a California Species of Special Concern.

Subsection (d) of Section 42 specifies requirements for the permit application, fees associated with the application, duration of permit, and qualification requirements. The proposed regulation establishes a new Commercial Native Rattlesnake **Permit** Application (Form DFW 1044 (New 4/2018)), which is incorporated by reference herein. **Allowing a natural person and not an entity to obtain a permit for a facility will allow the Department to more easily hold a permittee accountable for complying with these regulations, since it is easier to pursue a suspension, revocation, or criminal case against a natural person.** A separate permit is proposed for each facility housing native rattlesnake species or creating products from venom extracted from native rattlesnake species **because the Department must evaluate facility-level specifics such as whether the proposed use plan is consistent with the regulation, staff working there meet the minimum qualifications, and the facility itself appears capable of housing the proposed numbers of rattlesnakes and is reasonably secure.** The qualification requirements differ depending on whether the applicant plans to house live native rattlesnakes in their facility as follows:

1. If the applicant proposes to house live native rattlesnake species for the purposes of developing therapeutic products from venom, minimum experience and animal husbandry qualifications are proposed. A resume demonstrating a minimum of 1,000 hours experience with captive husbandry of snakes and 200 hours working directly with captive rattlesnakes or other venomous snakes within five years of the date of application is required. **Although these durations are less than those required to obtain permits to work with restricted species pursuant**

**to Section 671.1, the Department determined that these are the minimum amounts of time necessary for individuals to obtain the skills needed to competently and safely handle native rattlesnakes. The minimum qualifications to work with restricted species were developed as a one-size-fits-all approach to ensuring that the most dangerous animals on the list had qualified personnel handling them. In contrast, the proposed regulation is specific to rattlesnakes native to California, which are relatively safer to work with overall compared to the restricted species authorized through Section 671.1. Snake husbandry, particularly venomous snake husbandry, does not involve frequent handling, and existing state laws do not allow for industrial-scale possession of native rattlesnakes to extract venom. For these reasons, the Department determined that requiring the same amount of minimum experience to qualify for a restricted species permit was overly burdensome as well as unnecessary from a safety standpoint. In addition, an original, signed letter of reference is required as documentation that the experience requirements have been met. A statement of purpose for maintaining native rattlesnakes is required to demonstrate that the permittee will be using the native rattlesnakes in compliance with the specific purposes outlined in the regulation and to ensure no waste or improper use of a shared natural resource. A written Emergency Action Plan and proof of minimum age (18 years) are also required for the applicant and staff working with, and directly supervising staff working with, native rattlesnakes and their venom.**

2. If the applicant proposes only to develop therapeutic products from venom, the animal husbandry and Emergency Action Plan requirements no longer apply. A resume and an original, signed letter of reference documenting **that the experience requirements have been met are required.** A statement of purpose for the planned use of the venom and proof of minimum age (18 years) are also required **for the applicant and staff working with, and directly supervising staff working with, native rattlesnake venom.**

This subsection is necessary to establish the permitting system under which the activities will be authorized and to inform potential applicants of the application process, minimum qualifications, and fees involved in obtaining and maintaining a permit issued pursuant to this section. The information required in DFW 1044 is **similar to the information required in Form DFW 391b, and valid identification of the business so that the Department can confirm the applicant is the owner of the business.** Personal and business information is necessary for the Department to be able to contact the applicant and to undertake inspections of the facilities. The number of each species of native rattlesnake and how they



were acquired are necessary to determine if the proposed plan for commercial use is consistent with the terms of Section 42. Fees were calculated based on presumed staff time necessary to undertake application review, renewal, and issuance, as well as facility inspections.

Subsection (e) of Section 42 describes the general **permit conditions to maintain qualified staff at each facility whenever rattlesnakes are handled or their venom processed, the prohibition of sale of rattlesnakes with allowance of transfer or exchange of rattlesnakes among permittees, prohibition of release of rattlesnakes into the wild, the inspection requirements, and the conditions under which permits will be suspended, denied, or revoked.** This subsection is necessary to inform potential applicants of the terms and conditions associated with possessing a permit pursuant to this section. **These general conditions are necessary to ensure qualified personnel are present when the rattlesnakes or their venom are handled, the facility is properly set up and maintained, and that no rattlesnakes can escape their containment, which could result in a potential health and safety issue for the general public. The prohibition of sale, but approval of exchanges, is unique to this regulation and is intended to prevent establishment of a commercial trade in native rattlesnakes while simultaneously encouraging businesses to exchange surplus snakes to reduce the number needed to be collected from the wild. The initial inspection requirements are needed to ensure the requirements of the permit will be met and maintained once the permit is issued. The permit denial, permit suspension and revocation, and appeals requirements are necessary in case the Department must take action on a non-compliant permittee while ensuring that the permittee has sufficient due process.**

Subsection (f) of Section 42 describes the humane care and treatment that permittees must provide to native rattlesnakes possessed under this regulation. This subsection specifies requirements for enclosure size, substrate, and cleanliness; appropriate food and water; pest control; and observation and handling. This subsection will align the new regulations with the existing requirements in subsection 43(g). This subsection is necessary to ensure native rattlesnakes are properly cared for, reducing suffering and the need to collect from wild populations. This subsection is also necessary to inform applicants of the minimum care and treatment standards required to obtain and maintain a permit pursuant to this regulation.

Subsection (g) of Section 42 describes the requirement for each facility to maintain an Emergency Action Plan and the minimum contents of that plan in the event of a bite, escape, emergency evacuation, **or a security or containment failure.** The requirements in this subsection are similar to those in subsection 671.1(c)(3)(I). The Emergency Action Plan **ensures that** the permittee, **the**

employees, and any responding emergency personnel have access to the necessary information and equipment to respond to any emergency at any time. It also ensures that the appropriate agencies are notified in a timely manner of an escape or any serious injury or death of a person bitten by a native rattlesnake possessed under a **Commercial Native Rattlesnake Permit**. While subsections (g)(1)(A) through (g)(1)(F) require an applicant to list certain available emergency items and describe certain safety measures that would be taken, these subsections do not specify which emergency items a facility must have or measures it must take. Thus, as long as an applicant provides a list of the items it has and a description of the measures it would take, the Department would not deny an application for failing to comply with subsections (g)(1)(A) through (g)(1)(F). This subsection is necessary because permitted facilities may be housing large numbers of venomous snakes and the Emergency Action Plan ensures a quick response to any public health and safety issue from a permitted facility.

Subsection (h) of Section 42 describes the records a permittee must maintain while operating under a permit pursuant to this section and the duration the records must be kept and made available to the Department. The requirements in this subsection are **similar to** existing reporting requirements in subsections 43(h) and 43(i). This subsection is necessary to ensure that the permittee is complying with the terms of the permit and regulation. The proposed regulation establishes a new Commercial Native Rattlesnake Record (Form DFW 1044A (New 4/2018)), which is incorporated by reference herein. The information required in DFW 1044A is similar to the information required Forms DFW 391c, 391d, 391e.

Subsection (i) of Section 42 describes the annual reporting requirements under the regulation. This subsection is necessary to inform applicants that the records maintained under subsection (h) must be submitted to the Department **by November 1** on an annual basis. **The subsection also specifies the due dates of the report for non-renewals and business closures.**

Subsection (j) of Section 42 describes the terms of shipping live native rattlesnakes under the authority of this regulation and clarifies that this regulation does not supersede any federal, state, local, or shipping entity's rules regarding shipment of live rattlesnakes. This subsection is necessary to ensure proper notification to postal workers, documentation to law enforcement that the native rattlesnakes are being shipped legally under the authority of this regulation, and to ensure this regulation does not conflict with any other jurisdiction's rules or regulations regarding shipping native rattlesnakes.

#### Subsection (c) of Section 43

Subsection (c) of Section 43 restricts the sale, possession, transportation, importation, exportation, and propagation of native reptiles for commercial purposes to subsection 40(f) and the regulations contained within Section 43. To ensure consistency with the new regulations, this subsection needs to be amended to allow an exception for entities permitted through Section 42.

#### Subsection (a) of Section 651

Subsection (a) of Section 651 limits the sale of native reptiles and amphibians to scientific or educational institutions to biological supply houses that operate under a permit issued by the Department. Confusion regarding whether these institutions can also develop commercial products from the native reptiles and amphibians requires the addition of clarifying language proposed in this amendment. The proposed language explicitly states that **natural** persons who hold a valid **Commercial Native Rattlesnake Permit** issued by the Department and **out-of-state** commercial developers of biomedical or therapeutic agents shall be considered scientific and educational institutions for the purposes of this Section.

#### Subsection (a)(2) of Section 703

Subsection (a)(2) of Section 703 provides the forms and fees associated with the Commercial Native Rattlesnake Permit. **The forms are incorporated by reference because it would be cumbersome, unduly expensive, and otherwise impractical to publish them in Title 14, CCR. These forms are identified by title, form number, and date of publication.**

- (b) Authority and Reference Sections from Fish and Game Code for Regulation:

Authority: Section 5061, Fish and Game Code. Section 597, Penal Code. Sections 11503 and 11506, Government Code.

Reference: Sections 5060 and 5061, Fish and Game Code. Section 597, Penal Code. Sections 11503 and 11506, Government Code.

- (c) Specific Technology or Equipment Required by Regulatory Change:

None.

- (d) Identification of Reports or Documents Supporting Regulation Change:

Cates, C.C., E.V. Valore, G.W. Lawson, and J.G. McCabe. 2015. Comparison of the protective effect of a commercially available western

diamondback rattlesnake toxoid vaccine for dogs against envenomation of mice with western diamondback rattlesnake (*Crotalus atrox*), northern Pacific rattlesnake (*Crotalus oreganus oreganus*), and southern Pacific rattlesnake (*Crotalus oreganus helleri*) venom. American Journal of Veterinary Research 76(3):272-279.

#### **Economic and Fiscal Impact Statement (STD 399)**

(e) Public Discussions of Proposed Regulations Prior to Notice Publication:

No public meetings are being held prior to the notice publication. The 45-day comment period provides adequate time for review of the proposed amendments.

IV. Description of Reasonable Alternatives to Regulatory Action:

(a) Alternatives to Regulation Change:

The Department evaluated amending Section 43 “Captive Propagation and Commercialization of Native Reptiles” to include native rattlesnakes in subsection (c). This alternative was rejected due to the desire to maintain a narrow scope on the allowable commercial use of native rattlesnakes in the new regulation (i.e., solely for the development and sale of **biomedical and** therapeutic products). Because the original purpose of Section 43 was to authorize propagation of select species for the pet trade, it is necessary to keep commercial use of native rattlesnakes in a separate section to avoid confusion and the unintended creation of a commercial market for native rattlesnakes.

**The petitioners had initially proposed using “nuisance” snakes collected by rattlesnake removal businesses to develop antivenom, vaccines, and other therapeutic agents, as well as raising the possession limit on native rattlesnakes for aversion trainers. However, those proposals would have required additional public outreach and scoping of affected businesses that would have greatly delayed the development of the new regulations. The Department, Commission, and petitioner determined that the benefits to the public, including health and safety benefits, that are expected as a result of allowing commercial use of native rattlesnakes to develop regionally specific pharmaceutical products warranted moving forward on a more limited scope than what was requested in the original petition.**

**No other alternatives were identified by or brought to the attention of Commission staff that would have the same desired regulatory**

**effect.**

(b) No Change Alternative:

Under the no change alternative, no commercial production of antivenom, vaccines, or other biomedical and therapeutic agents derived from native rattlesnakes could legally occur in California.

(c) Consideration of Alternatives:

In view of information currently possessed, no reasonable alternative considered would be more effective in carrying out the purpose for which the regulation is proposed, would be as effective and less burdensome to affected private persons than the proposed regulation, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

V. Mitigation Measures Required by Regulatory Action:

The proposed regulatory action is not expected to have a significant effect on the environment; therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action:

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made:

(a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

The proposed action will not have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states. It establishes the ability for California companies to compete with out-of-state companies in the development and sale of pharmaceutical products derived from native rattlesnakes.

(b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:



The Commission does not anticipate significant impacts on the creation or elimination of jobs, the creation of new business, the elimination of existing businesses or the expansion of businesses in California due to the limited number of anticipated permit applications.

The Commission anticipates benefits to the health and welfare of California residents through the development of improved therapeutic agents to treat rattlesnake bites in pets and domestic livestock.

The Commission does not anticipate any non-monetary benefits to worker safety.

This regulation includes a reporting requirement that applies to business. Pursuant to Government Code section 11346.3(d), the Commission finds that it is necessary for the health, safety, or welfare of the people of the state of California that the regulation apply to business.

(c) Cost Impacts on a Representative Private Person or Business:

The Commission estimates that a representative private person or business would necessarily incur \$815 in permitting and inspection costs in the first year and \$113 in annual costs in reasonable compliance with the proposed action.

(d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State:

The Commission anticipates revenue to recover the Department's administrative costs from initial inspections and permit fees for the first year from each business and annual renewal fees thereafter. The proposed action will not affect any other State Agency.

(e) Nondiscretionary Costs/Savings to Local Agencies:

None

(f) Programs Mandated on Local Agencies or School Districts:

None.

(g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code:

None.

(h) Effect on Housing Costs:

None.

VII. Economic Impact Assessment:

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State:

Due to the limited number of expected applicants, the regulation has the potential to create a small number of jobs in the State. The proposed regulation should not eliminate any jobs.

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State:

The regulation is expected to provide new business opportunities within the State.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State:

None.

(d) Benefits of the Regulation to the Health and Welfare of California Residents:

Allowing possession **and propagation** of native rattlesnakes as described in Section 42 is expected to result in more effective and cheaper antivenom and vaccines as well as other therapeutic agents.

(e) Benefits of the Regulation to Worker Safety:

None.

(f) Benefits of the Regulation to the State's Environment:

None.

(g) Other Benefits of the Regulation:

None.

## Informative Digest/Policy Statement Overview

The Fish and Game Commission (Commission) received a petition in 2015 to amend existing regulations or adopt new regulations that would allow for the commercial use of native rattlesnakes to develop antivenom, vaccines, and other therapeutic agents. The Commission approved the petition request at its February 11, 2016 meeting in Sacramento and forwarded it to the Department of Fish and Wildlife (Department) for evaluation. Department staff met with the petitioners during 2016 to gather additional information. The petitioners had initially proposed using “nuisance” snakes collected by rattlesnake removal businesses for this purpose, as well as raising the possession limit on native rattlesnakes for aversion trainers. However, those proposals would have required additional public outreach and scoping of affected businesses that would have greatly delayed the development of the new regulations. Therefore, with the petitioners’ consent, the Department narrowed the scope of the regulatory proposal to address only commercialized use of native rattlesnakes for venom extraction in conjunction with research and development of biomedical and therapeutic agents. In addition, the Department added propagation of native rattlesnakes at the request of the petitioners.

The Commission has the statutory authority to adopt regulations for the commercial use of native reptiles pursuant to Fish and Game Code Section 5061. Currently, there are only two authorized commercial activities in California: captive propagation and sale of three species of snakes, which is allowed under Section 43, and wild collection and sale of native reptiles by biological supply houses, which is allowed under Section 651.

Venom from rattlesnakes differs by species, and in some cases by location within the species. For example, Southern Pacific Rattlesnake (*Crotalus oreganus helleri*) venom has unique properties that differ across its range. Antivenom and vaccines that are derived from different species of rattlesnakes than the species that inflicted the bite are less effective, and sometimes not effective at all, in treatment of the bite. Currently, the only way antivenom, vaccines, and therapeutic agents can be derived from native rattlesnakes in California is through non-commercial research and development through a valid Scientific Collecting Permit pursuant to Section 650. However, biological supply houses can collect native rattlesnakes and sell them to out-of-state scientific and educational facilities that develop and sell these products.

### Existing Regulations

The text of Section 42 was repealed in January 2002, but the title and note are still listed in Title 14, Code of Regulations (CCR). Section 43 contains regulations for the captive propagation of native reptiles and sale of three species of native snakes. Section 651 regulations specify the wild collection and sale of native reptiles by biological supply houses. **Section 703 contains the applications, forms and fees associated with Department-issued permits for restricted species, non-detrimental transgenic aquatic animals and falconry.**

## Proposed Regulations

The proposed Section 42 regulation will allow California businesses to develop and sell regionally specific antivenom, vaccines, and therapeutic agents derived from native rattlesnake venom that would benefit human, pet, and livestock health. The new permit is structured to allow for:

1. Businesses which seek to maintain live native rattlesnake species for venom extraction and develop and sell therapeutic products from the native rattlesnake venom,
2. Businesses which only intend to develop and sell therapeutic products from the native rattlesnake venom, **and**
3. **Businesses to purchase native rattlesnakes from a biological supply house for the purpose of developing and selling biomedical and therapeutic products.**

In addition, it is necessary to make minor amendments to Sections 43, 651, and 703 to provide consistency and clarity with the proposed Section 42.

Subsection (a) of Section 42 details the activities that the activities that allowed with a **Commercial Native Rattlesnake Permit** issued by the Department.

Subsection (b) of Section 42 specifies that this regulation does not supersede any other federal, state, or local laws regulating or prohibiting possession of native rattlesnakes or the activities authorized under a **Commercial Native Rattlesnake Permit**.

Subsection (c) of Section 42 lists the species of native rattlesnakes that may be used under this regulation.

Subsection (d) of Section 42 specifies regulations for the permit application, fees, duration of permit, and qualification requirements, such as minimum qualifications, letter of reference, statement of purpose, an emergency action plan, an initial inspection and minimum age. A separate permit is proposed for each facility housing native rattlesnake species or creating products from venom extracted from native rattlesnake species. The proposed regulation establishes a new **Commercial Native Rattlesnake Permit Application** (Form DFW 1044 (New 4/2018)), which is incorporated by reference herein.

**Subsection (e) of Section 42 describes the general permit conditions to maintain qualified staff at each facility whenever rattlesnakes are handled or their venom processed, the prohibition of sale of rattlesnakes with allowance of transfer or exchange of rattlesnakes among permittees, prohibition of release of rattlesnakes**

**into the wild, the inspection requirements, and the conditions under which permits will be suspended, denied, or revoked.**

Subsection (f) of Section 42 describes the humane care and treatment that permittees must provide to native rattlesnakes possessed under this regulation. It includes requirements on enclosure size, substrate, and cleanliness; appropriate food and water; pest control; and observation and handling.

Subsection (g) of Section 42 describes the requirement for each facility to maintain an Emergency Action Plan and the minimum contents of that plan in the event of a bite, escape, or emergency evacuation.

Subsection (h) of Section 42 describes the records a permittee must maintain while operating under a permit pursuant to this **Section** and the duration the records must be kept and made available to the department. The proposed regulation establishes a new Commercial Native Rattlesnake Record (Form DFW 1044A (New 4/2018)), which is incorporated by reference herein.

Subsection (i) of Section 42 describes the annual reporting requirements under the regulation.

Subsection (j) of Section 42 describes the terms of shipping live native rattlesnakes under the authority of this regulation and clarifies that this regulation does not supersede any federal, state, local, or shipping entity's rules regarding shipment of live rattlesnakes.

Subsection (c) of Section 43 restricts the sale, possession, transportation, importation, exportation, and propagation of native reptiles for commercial purposes except as provided in subsection 40(f) and the species identified within Section 43. To ensure consistency with the new regulation, this amendment adds an exception for entities permitted through Section 42.

Subsection (a) of Section 651 limits the sale of native reptiles and amphibians to scientific or educational institutions to biological supply houses that operate under a permit issued by the Department. This proposed amendment states that **natural** persons who hold a valid **Commercial Native Rattlesnake Permit** issued by the department and **out-of-state** commercial developers of biomedical or therapeutic agents shall be considered scientific and educational institutions for the purposes of this section.

Subsection (a)(2) of Section 703 specifies the forms and fees associated with the Commercial Native Rattlesnake Permit. **The forms are incorporated by reference because it would be cumbersome, unduly expensive, and otherwise impractical**



**to publish them in Title 14, CCR. These forms are identified by title, form number, and date of publication.**

#### Benefits of the regulations

Allowing for possession **and propagation** of native rattlesnakes as described in Section 42 is expected to result in more effective and cheaper antivenom and vaccines as well as other therapeutic agents.

#### Consistency with State and Federal Regulations

Article IV, section 20 of the State Constitution specifies that the Legislature may delegate to the Fish and Game Commission such powers relating to the protection and propagation of fish and game as the Legislature sees fit. The Legislature has delegated to the Commission the power to regulate commercial take of native reptiles (Fish & Game Code, §5061). The Commission has reviewed its own regulations and finds that the proposed regulations are neither inconsistent nor incompatible with existing state regulations. The Commission has searched the California Code of Regulations and finds no other state agency regulations pertaining to native rattlesnakes. Further, the Commission has determined that the proposed regulations are neither incompatible nor inconsistent with existing federal regulations.

## Regulatory Language

### KEY:

Text originally proposed to be added is shown in underline format

Text originally proposed to be deleted is shown in ~~strikeout format~~

Text newly proposed to be added is shown in **bold double-underline format**

Text newly proposed to be deleted is shown in ~~**bold double-strikeout format**~~

Text originally proposed to be added and now proposed to be deleted is shown in ~~**bold underline double-strikeout format**~~

Add Section 42, to Title 14, CCR:

### **Section 42. ~~Protected Reptiles~~Commercial Use and Possession of Native Rattlesnakes for Biomedical and Therapeutic Purposes.**

(a) Except as otherwise provided in these regulations, it shall be unlawful for persons without a valid ~~commercial native rattlesnake permit~~**Commercial Native Rattlesnake Permit** issued by the department to:

(1) possess, ~~purchase~~, propagate, exchange, or transport native rattlesnakes for commercialized venom extraction; ~~or~~

(2) sell, import, or export native rattlesnake venom or products derived from native rattlesnake venom for commercial purposes; ~~or~~

**(3) purchase native rattlesnakes from a biological supply house, permitted through Section 651, for the purpose of developing and selling biomedical and therapeutic products.**

#### **(b) Consistency with Federal, State, and Local Laws.**

A permit issued pursuant to this section does not supersede any federal, state, or local law regulating or prohibiting native rattlesnakes or the activities authorized in a ~~commercial native rattlesnake permit~~**Commercial Native Rattlesnake Permit**.

#### **(c) Authorized Native Rattlesnake Species.**

A ~~commercial native rattlesnake permit~~**Commercial Native Rattlesnake Permit** may be issued pursuant to this section for the following native rattlesnake species, including their subspecies and taxonomic successors:

(1) Western diamond-backed rattlesnake (*Crotalus atrox*),

(2) Mohave rattlesnake (*Crotalus scutulatus*),

(3) Western rattlesnake (*Crotalus oreganus*),

(4) Speckled rattlesnake (*Crotalus mitchellii*),

(5) Sidewinder (*Crotalus cerastes*), and

(6) Panamint rattlesnake (*Crotalus stephensi*).

#### **(d) Permit Application and Fees.**

(1) Application form 2018 COMMERCIAL **NATIVE RATTLESNAKE PERMIT APPLICATION (DFW 1044 (NEW 4/2018))** for a permit shall be completed in its entirety and submitted with the permit and nonrefundable inspection fees as specified in Section 703.

Application forms are available on the department's website at [www.wildlife.ca.gov](http://www.wildlife.ca.gov).

(2) Duration of Permit. Permits issued under this section shall be valid from January 1 through December 31 each year, or if issued after the beginning of that term, for the remainder thereof. Applications for renewal must be received by the department no later than November 1.

(3) Permitted facilities. A **natural** person shall obtain a separate ~~commercial native rattlesnake permit~~ **Commercial Native Rattlesnake Permit** for each facility housing native rattlesnake species or creating products from venom extracted from native rattlesnake species described in subsection (c) for purposes described in subsection (a).

(4) Qualifications. The following information and documents shall accompany an application for each new permit or renewal unless specified as exempt or as specifically required:

(A) For an application that proposes housing live native rattlesnake species and will develop products derived from venom extracted from native rattlesnake species:

1. A resume that provides the dates and description of an applicant's or their employee's experience **researching and creating products from venom extracted from rattlesnake species or similar experience and** working with venomous snakes and husbandry of captive snakes, demonstrating the following qualifications:

a. Possess a minimum of 1000 hours experience with captive husbandry of snakes within five (5) years of the date of application; and

b. Possess a minimum of 200 hours of experience working with captive rattlesnakes or other venomous snakes within five (5) years of the date of application.

2. A letter of reference from an expert in venomous snake captive husbandry and research, dated within five (5) years of the date of application, on letterhead stationery with an original signature signed in ink by the owner or operator of a facility where the applicant's or their employee gained his/her experience. The letter shall provide the printed name of the owner or operator and detailed information regarding the quality and extent of the applicant's or their employee's knowledge and experience related to the permit requested.

3. A statement of purpose describing in detail the planned uses for the ~~species native rattlesnakes~~ **rattlesnakes, including approximate desired maximum quantities of each species being housed at the facility, and their venom.**

4. A written Emergency Action Plan as specified in subsection (g).

~~5. An initial inspection is required for new permits prior to the permit being issued.~~

~~6-5.~~ Proof that the applicant ~~is~~ **and staff working with, and directly supervising staff working with, native rattlesnakes and their venom are** at least 18 years of age at the time of application.

(B) For an application that does not propose housing live native rattlesnakes and will only develop products derived from venom extracted from native rattlesnake species:

1. A resume that provides the dates and description of an applicant's or their employee's experience **researching and creating products from venom extracted from rattlesnake species or similar experience.**

2. A letter of reference from an expert in venomous snake research, dated within five (5) years of the date of application, on letterhead stationery with an original signature signed in ink by the owner or operator of a facility where the applicant or their employee gained his/her experience. The letter shall provide the printed name of the owner or operator and detailed information regarding the quality and extent of the applicant or their employee's knowledge and experience related to the permit requested
3. A statement of purpose describing in detail the planned uses for the venom.
4. Proof that the applicant ~~is~~ and staff working with, and directly supervising staff working with, native rattlesnake venom are at least 18 years of age at the time of application.

**(e) General Conditions.**

~~(1) Inspections. The department may enter the facilities of any permittee where native rattlesnakes are housed, or reasonably may be housed, at any reasonable hour to inspect the animals and their enclosures and to inspect, audit or copy records required by this section.~~

~~(A) The department may deny the issuance of, or immediately suspend, the permit of a permittee who refuses to allow inspection of a facility, permit, book, or other record required to be kept by the permittee. A refusal to allow inspection may be inferred if, after reasonable attempts by the department, the permittee does not make the facility, permit, book, or other record available for inspection. The department may reinstate a permit suspended pursuant to this subsection if the permittee allows the department to inspect the facility, permit, book, or other record.~~

(1) At least one natural person who meets the minimum qualifications, as defined in subsection (d), shall be present whenever rattlesnakes are being handled or venom is being processed.

(2) Native rattlesnakes possessed pursuant to this section shall not be sold but may be transferred to or exchanged with a natural person with a valid ~~commercial native rattlesnake permit~~ Commercial Native Rattlesnake Permit. The receiving permittee may be charged only to recover actual transportation and shipping costs.

(3) Native rattlesnakes ~~which that~~ have been in captivity, including wild-caught and captive-bred individuals or offspring, shall not be released into the wild.

**(4) Inspections.**

(A) The facility must pass an initial inspection to ensure the requirements of this section are met before the department will issue a permit.

(B) The department may enter the facilities of any permittee where native rattlesnakes are housed, or reasonably may be housed, at any reasonable hour to inspect the animals and their enclosures and to inspect, audit, or copy records required by this section.

(C) The department may deny the issuance of, or immediately suspend, the permit of a permittee who refuses to allow inspection of a facility, permit, book, or other record required to be kept by the permittee. A refusal to allow inspection may be inferred if, after reasonable attempts by the department, the permittee does not make the facility, permit, book, or other record available for inspection. The department may reinstate a permit suspended pursuant to this subsection if

the permittee allows the department to inspect the facility, permit, book, or other record and no violations of these regulations or any permit condition are observed during that inspection.

~~(4)(5)~~ Denial. The department shall deny a ~~commercial native rattlesnake permit~~**Commercial Native Rattlesnake Permit** initial application or renewal application for any applicant who fails to comply with any provision in this regulation, and may deny an initial application or renewal application for any applicant who violates the Fish and Game Code, Title 14 regulations, any term or condition of a ~~commercial native rattlesnake permit~~**Commercial Native Rattlesnake Permit**, or any other state or federal statute or regulation pertaining to wildlife or animal cruelty. Within 30 calendar days of a denial, an applicant may submit a written request for a hearing before the commission to show cause why his/her permit should be issued.

~~(5)(6)~~ Revocation. Any permit issued pursuant to these regulations may be suspended or revoked at any time by the department as described below.

(A) For a permittee who has been convicted in a court of competent jurisdiction of violating the Fish and Game Code, Title 14 regulations, or any other state or federal statute or regulation pertaining to wildlife or animal cruelty, the suspension or revocation shall take effect when the permittee receives a notice of suspension or revocation. The permittee may submit a written request to the commission for a hearing to show cause why his/her permit should be reinstated.

(B) For a permittee who has violated the Fish and Game Code, Title 14 regulations, any term or condition of a ~~commercial native rattlesnake permit~~**Commercial Native Rattlesnake Permit**, or any other state or federal statute or regulation pertaining to wildlife or animal cruelty, but has not been convicted of any such violation, the suspension or revocation shall not take effect unless 15 calendar days have passed from the date the permittee receives an accusation sent pursuant to Government Code Section 11503, and the permittee has not submitted to the commission a notice of defense described in Government Code Section 11506. If a permittee submits a timely notice of defense, the suspension or revocation shall take effect if, after a commission hearing, the commission finds by a preponderance of evidence that the department's suspension or revocation is warranted.

**(f) Humane Care and Treatment.** Permitted facilities that house live native rattlesnakes shall comply with the following provisions:

(1) Enclosures. The perimeter of the enclosure for snakes 33 inches in length or less shall be 1.5 times the length of the snake. The perimeter of the enclosure for snakes more than 33 inches in length shall be 1.25 times the length of the snake. The perimeter shall be measured on the inside of the top edge of the enclosure. Snakes may be kept in smaller cages or containers for 31 calendar days from the date of birth ~~or hatching~~ and while being transported. All enclosures shall be adequately ventilated. The substrate shall facilitate the ability to maintain a clean and healthy environment for each animal.

(2) Food. Food shall be wholesome, palatable and free from contamination and shall be supplied in sufficient quantity and nutritive value to maintain the animal in good health.



(3) Water. Potable water shall be accessible to the animals at all times or provided as often as necessary for the health and comfort of the animal. All water receptacles shall be clean and sanitary.

(4) Cleaning of enclosures. Excrement shall be removed from enclosures as often as necessary to maintain animals in a healthy condition.

(5) Disinfection of enclosures. All enclosures shall be disinfected after an animal with an infectious or transmissible disease is removed from an enclosure.

(6) Pest control. Programs of disease prevention and parasite control, euthanasia and adequate veterinary care shall be established and maintained by the permittee.

(7) Observation. Animals shall be observed at least twice a week by the permittee or once a week if the animals are in hibernation. Sick, diseased, stressed, or injured animals shall be provided with care consistent with standards and procedures used by veterinarians or humanely destroyed.

(8) Handling. Animals shall be handled carefully so as not to cause unnecessary discomfort, behavioral stress, or physical harm to the animal.

**(g) Emergency Action Plan.**

(1) Every ~~commercial native rattlesnake~~ **Commercial Native Rattlesnake** permittee that houses live native rattlesnakes shall have a written Emergency Action Plan readily available, posted in a conspicuous place, and shall submit a copy to the department with the initial permit and renewal application. The Emergency Action Plan shall be titled, ~~with a revision date, updated annually and include, but is not limited to the following state a revision date and emergency telephone numbers including the local department regional office, 911, and local animal control agencies, updated annually, and include, at a minimum, the following items:~~

(A) List of the re-capture equipment available;

(B) Description of humane lethal dispatch methods and a list of qualified personnel who are trained to carry out the methods;

(C) List of medical supplies/first aid kits and where they are located;

(D) Description of mobile transport cages and equipment on hand;

~~(E) List of emergency telephone numbers that includes the local department regional office, 911, and animal control agencies; and~~

~~(F)(E)~~ Written plan of action for emergencies to include but not be limited to rattlesnake bites, escape of rattlesnakes, and emergency facility evacuations.

(2) Permittees are responsible for the capture, and for the costs incurred by the department related to capture or elimination of the threat, of an escaped rattlesnake or the use of humane lethal force required to capture a rattlesnake that escapes.

(3) Any incident involving a rattlesnake held under a ~~commercial native rattlesnake permit~~ **Commercial Native Rattlesnake Permit** that results in serious injury or death to a **natural** person shall be reported immediately to the nearest department regional office. If the department determines that serious injury or death has occurred as a result of contact with a rattlesnake, the permit may be reviewed and subject to change by the department. Additional conditions to the permit may be added at any time to provide for public health and safety.

(4) Permittees shall immediately report by telephone the escape of a rattlesnake possessed pursuant to this section to the nearest department regional office and the nearest law enforcement agency of the city or county in which the rattlesnake escaped.

~~(h) Records. As specified in Section 703 COMMERCIAL NATIVE RATTLESNAKE PERMIT RECORD DFW 1044 (NEW 4/2017)) forms are available on the~~

~~department's website at [www.wildlife.ca.gov](http://www.wildlife.ca.gov).~~ Every permittee that houses live native rattlesnakes shall keep accurate accounting records for three (3) years from most recent issuance or renewal of the permit in which all of the following shall be recorded:

(1) The complete scientific name and number of all native rattlesnakes purchased, propagated, transferred, exchanged, died and possessed.

(2) The person from whom the native rattlesnakes were purchased, exchanged or transferred.

~~(3) The person to whom the native rattlesnakes were exchanged or transferred.~~

~~(3)(4) The date that the native rattlesnakes were purchased, exchanged, transferred, propagated or died.~~

~~(4)(5) All required records shall be legible and in the English language and maintained within the State of California.~~

(i) Annual Reporting Requirement. No permit shall be renewed unless the permittee submits the record specified in Section 703, on or before ~~December 31~~ **November 1** of each year. The permittee must submit the record even if there is zero activity to report, or the permittee is not going to renew the permit. **If the permittee is not going to renew the permit, the record specified in Section 703 must be submitted on or before December 31 or within 30 days of the business closing.**

(j) Shipments. All deliveries or shipments of live native rattlesnakes taken under authority of this section shall have a legible copy of the valid permit attached to the outside of the shipping container, which shall be conspicuously labeled: "Live Rattlesnakes - Handle With Care". This subsection does not supersede any federal, state, or local law or regulation or shipper's requirements concerning shipment of live rattlesnakes.

Note: Authority cited: Sections 200, 202, 205, 210, 219 and 2205061, Fish and Game Code. ~~Penal Code 597, Government Code Sections 11503 and 11506.~~ Reference: Sections 200-202, 205, 206, 210, 215, 219 and 2205060 and 5061, Fish and Game Code. ~~Penal Code 597, Government Code Sections 11503 and 11506~~ **Section 597, Penal Code. Sections 11503 and 11506, Government Code.**

Subsection (c) of Section 43, Title 14, CCR, is amended to read as follows:

#### **§ 43. Captive Propagation and Commercialization of Native Reptiles.**

*... No proposed changes to subsections (a) and (b)*

(c) Propagation and Possession for Commercial Purposes. Native reptiles may not be sold, possessed, transported, imported, exported or propagated for commercial

purposes, except as provided in ~~Section 40(f), and except~~sections 40(f) and 42 and as follows:

*... No proposed changes to subsections (c)(1), (c)(2), and (d) through (k)*

Note: Authority cited: Sections 200, ~~202, 205, 220, 265~~, 275, 5061 and 6896, Fish and Game Code. Reference: Sections 200, ~~202, 205, 220, 265~~, 275, 5061 and 6896, Fish and Game Code.

Subsection (a) of Section 651, Title 14, CCR, is amended to read as follows:

**§ 651. Commercial Take of Native Reptiles and Amphibians for Scientific or Educational Institutions.**

(a) Native reptiles and amphibians may be sold to scientific or educational institutions only by owners of biological supply houses who have been issued a permit by the department for such purposes. ~~Persons~~Natural person who hold a valid ~~commercial native rattlesnake permit~~Commercial Native Rattlesnake Permit pursuant to Section 42 or out-of-state commercial developers of biomedical and therapeutic agents shall be considered scientific and educational institutions for the purposes of this section.

*... No proposed changes to subsections (a)(1), (a)(2), (a)(3), and (b) through (i)*

Note: Authority cited: Sections 1002, 5061, 6851 and 6896, Fish and Game Code. Reference: Sections 1002, 5050, 5060, 5061, ~~6850, 6852, 6854-6855~~6854, 6855, 6895 and 6896, Fish and Game Code.

Subsection (a)(2) of Section 703, Title 14, CCR is added as follows:

**§ 703. Miscellaneous Applications, Tags, Seals, Licenses, Permits, and Fees.**

(a) Applications, Forms and Fees for January 1 through December 31 (Calendar Year).

*...No proposed changes to subsection (a)(1))*

(2) Commercial Permit for Native Rattlesnakes

(A) 2018 Commercial Native Rattlesnake Permit Application, DFW 1044 (NEW 4/20172018), incorporated by reference herein.

<u>1.</u>	<u>Commercial Native Rattlesnake Permit Fee (New)</u>	<u>\$ 208.50</u>
<u>2.</u>	<u>Commercial Native Rattlesnake Permit Fee (Renewal)</u>	<u>\$ 113.00</u>

3. Fee for one initial inspection per facility \$ 606.50

(B) Commercial Native Rattlesnake Permit Record, DFW 1044A (NEW 4/20172018),  
incorporated by reference herein.

*...No proposed changes to subsections (a)(3) and (b)*

Note: Authority cited: Sections 713, 1002, 1050, 1053, 1745, 2118, 2120, 2122, 2150, 2150.2 and ~~2157~~, 2157 and 5060, Fish and Game Code. Reference: Sections 395, 396, 398, 713, 1050, 1053, 1745, 2116, 2116.5, 2117, 2118, 2120, 2125, 2150, 2150.2, 2150.4, 2151, 2157, 2190, 2193, 2271, 3005.5, 3007, 3503, 3503.5, 3511, 3513, 3950, 5060, 5061, 10500, 12000 and 12002, Fish and Game Code; and Title 50, Code of Federal Regulations, Parts 21.29 and 21.30.

**2018 COMMERCIAL NATIVE RATTLESNAKE PERMIT APPLICATION**

DFW 1044 (NEW 4/2017-2018)

**VALID JANUARY 1, 2018 THROUGH DECEMBER 31, 2018** (If issued after January 1, valid on date of issuance)**PERMIT FEE PER FACILITY:** ☐ **NEW \$208.50** ☐ **RENEWAL: \$113.00** ☐ **INSPECTION FEE: \$606.50** (New facilities only)

(Fee includes a nonrefundable three percent (3%) application fee, not to exceed \$7.50)

**NOTE: AN INITIAL INSPECTION IS REQUIRED FOR NEW PERMITS PRIOR TO THE PERMIT BEING ISSUED. IF YOU ARE NOT GOING TO HOUSE NATIVE RATTLESNAKES, AN INITIAL INSPECTION IS NOT REQUIRED.****IMPORTANT: If you will not be housing native rattlesnakes but will be developing products derived from native rattlesnake venom, please check the box below. See instructions on reverse. Type or print clearly.**

FIRST NAME	M.I.	LAST NAME	GO ID NUMBER (FROM ALDS ISSUED LICENSE)
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BUSINESS NAME (If applicable)

MAILING ADDRESS	COUNTY	DAY TELEPHONE ( )
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CITY	STATE	ZIP CODE	E-MAIL ADDRESS
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SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	HAIR COLOR	EYE COLOR	HEIGHT (Ft., In.)	WEIGHT	DATE OF BIRTH
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FACILITY ADDRESS	COUNTY	FACILITY TELEPHONE ( )
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CITY	STATE	ZIP CODE	FACILITY E-MAIL ADDRESS
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LIST CUMULATIVE TOTALS OF ALL NATIVE RATTLESNAKES IN POSSESSION (Attach additional pages if necessary)

**\*New Applicants: For rattlesnakes to be acquired, complete as "TBA".**

Qty.	Common Name	Scientific Name (Include sub-species)	Date Acquired or TBA*	Acquired Source

☐ I am not housing native rattlesnakes and will only be developing products derived from venom extracted from native rattlesnake species.

I certify that I have read, understand, and agree to abide by, all conditions of this permit, the applicable provisions of the FGC, and the regulations promulgated thereto. I certify that I am not currently under any Fish and Wildlife license or permit revocation or suspension, and that there are no other legal or administrative proceedings pending that would disqualify me from obtaining this permit. I agree that if I make any false statement as to any fact required as a prerequisite to the issuance of this permit, the permit is void and will be surrendered where purchased, and I understand that I may be subject to prosecution pursuant to FGC Section 1054 or to other administrative actions pursuant to Section 746, Title 14, of the CCR.

SIGNATURE <b>X</b>	DATE
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**FOR DEPARTMENT OF FISH AND WILDLIFE USE ONLY**

REVIEWED BY/DATE	TRANSACTION #	ISSUED BY/DATE
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**NEW APPLICANTS - YOU MUST INCLUDE A COPY OF YOUR IDENTIFICATION WITH THIS APPLICATION**





**INSTRUCTIONS FOR COMPLETING THE COMMERCIAL NATIVE RATTLESNAKE PERMIT APPLICATION**

Please allow 60 calendar days for processing the application. This permit covers the commercial use and possession of native rattlesnakes for biomedical and therapeutic purposes. Records must be kept in accordance with Section 42(h), Title 14, of the CCR. A copy of the Commercial Native Rattlesnake Permit Record (form DFW 1044A) shall be submitted to the Department with renewal application by ~~December 31<sup>st</sup>~~ **November 1<sup>st</sup>** of each year. No permit shall be renewed unless the completed Commercial Native Rattlesnake Permit Record is submitted.

**NOTE: PERMITTEES WHO ARE NOT RENEWING THEIR PERMITS MUST SUBMIT A COMMERCIAL NATIVE RATTLESNAKE PERMIT RECORD BY DECEMBER 31<sup>ST</sup> OR WITH 30 DAYS OF THE BUSINESS CLOSURE.**

**IMPORTANT: If you are not housing native rattlesnakes but will be developing products derived from native rattlesnake venom, please check the box above the signature line.**

**NEW APPLICANTS:** You must be at least 18 years of age. You must have your permanent rattlesnake housing facility built and ready to be inspected by the Department when you submit this application. Submit the inspection fee, as specified in Section 703 with this application. If the permitted facility houses native rattlesnake species, your permanent rattlesnake housing facility must pass an inspection by the Department, as specified in Section 42(d), before your permit may be issued. The Department will contact you to schedule an appointment to have your facility inspected.

**IMPORTANT:** Incomplete applications will be returned and could delay the issuance of your permit. Contact the License and Revenue Branch at (916) 928-5853 or [spu@wildlife.ca.gov](mailto:spu@wildlife.ca.gov) if you need additional information regarding Commercial Native Rattlesnake Permits.

1. It is mandatory to complete all items.
2. If renewing your permit, you must submit ~~copies of records required in Section 42(h)~~ a completed Commercial Native Rattlesnake Permit Record (DFW 1044A).
3. A resume that provides the dates and description of an applicant's or their employee's experience working with venomous snakes or snake venom and meeting the minimum qualifications, as described in Section 42(d).
4. Proof that you and any employees involved in handling rattlesnakes or their venom are at least 18 years of age, as described in Section 42(d).
5. A letter of reference, as described in Section 42(d).
6. A statement of purpose, as described in Section 42(d).
7. A copy of your Emergency Action Plan for each facility, as described in Section 42(g).
8. Sign and date the application.
9. Mail this application, the Commercial Native Rattlesnake Permit Record (renewals only), a copy of identification, all required attachments listed above, and a cashier's check, money order, personal or business check\* or credit card\*\* authorization form with the appropriate fee to the Department of Fish and Wildlife, License and Revenue Branch, 1740 N. Market Blvd., Sacramento, CA 95834 or apply in person. **DO NOT SEND CASH.**\*\*\*

**INDIVIDUAL AND BUSINESS IDENTIFICATION REQUIREMENTS**

Section 700.4(c), Title 14, of the California Code of Regulations (CCR) states any applicant applying for any license, tag, permit, reservation or other entitlement issued via the Automated License Data System (ALDS) shall provide valid identification.

All business applicants must provide documentation identifying the business' structure type. Acceptable forms of business identification include:

- Articles of Incorporation
- Statement of Partnership
- Registration as a Limited Liability Partnership; or
- Certificate of Limited Partnership
- Statement of Partnership Authority
- Statement of Sole Proprietorship

If a business' identification names individual(s), each individual must provide a valid individual identification and provide their date of birth, sex, hair and eye color, height and weight.

**NOTICE**

**Disclosure Statement** - Under Section 42, Title 14, of the CCR, the Department of Fish and Wildlife is authorized to collect information from applicants to maintain a record of licensure. All information requested on this application is mandatory unless otherwise indicated. An applicant's name and city of residence may be provided to the public if requested. Other personal information submitted on this application may be released for law enforcement purposes, pursuant to court order, or for official natural resources management purposes.

A licensee may obtain a copy of his/her license records maintained by the Department by submitting a written request to the Custodian of Records, Department of Fish and Wildlife, License and Revenue Branch, 1740 N. Market Blvd., Sacramento, CA 95834. All requests must include the requester's name, address, and telephone number.

**PAYMENT POLICY**

\* **Personal or business checks** will be accepted by the Department if name and address are imprinted on the check. Checks returned to the Department due to insufficient funds will render your permit invalid. The Department may also deny the issuance or renewal of any permit if a person has failed to reimburse the Department for the amount due. Any activity performed without a valid permit is a violation of the Fish and Game Code and therefore subject to enforcement action.

\*\* **Credit Cards**—Licenses, permits, tags, stamps, or registrations may be purchased with a Visa or MasterCard.

\*\*\***Cash** will no longer be accepted at California Department of Fish and Wildlife offices starting January 1, 2017.



1. Complete the record in full including first name, middle initial, last name, GO ID#, permit #, and permit year.
2. Enter the date, scientific name and number of native rattlesnakes that were purchased, propagated, transferred, exchanged, died, total possessed and the recipients or sellers name.  
**NOTE: "Total Possessed" is the complete inventory of each species per facility.**
3. Check the appropriate box if you are no longer doing the activities which require renewal of the permit, are submitting a "zero" record or do not house native rattlesnakes.  
**IMPORTANT! If you are no longer doing the activities which require renewal of the permit, or are submitting a "zero" record, you are still required to submit final reports by December 31, each year or within 30 days of the business closing.**
4. Sign and date the record.
5. Mail the record to the Department of Fish and Wildlife, License and Revenue Branch, 1740 N. Market Blvd., Sacramento, CA 95834.

FIRST NAME	M.I.	LAST NAME	GO ID#	PERMIT#	YEAR

**THIS RECORD MUST BE CURRENT AT ALL TIMES**

[illegible]

- ☐ I do not house native rattlesnakes and only develop products derived from venom extracted from native rattlesnake species.
- ☐ I am no longer doing the activities which require renewal of the permit and am submitting my final report.
- ☐ I have no activity to report and am submitting a “zero” record.

*I certify that all information on this report is true and correct to the best of my knowledge.*

SIGNATURE	DATE
X	

**From:** James McCabe  
**Sent:** Tuesday, June 26, 2018 2:05 PM  
**To:** FGC  
**Subject:** Re: Notice of continuation: Commercial use/possession of native rattlesnakes  
**Attachments:** June 26 Letter to Fish and Game Commission (1).docx

Dear Mr. Pimentel and members of the FGC,

Thank you for the opportunity to comment on modified proposed regulations for regulatory action relative to sections 42, 43, 651, and 703, Title 14, California Code of Regulations. We have a number of questions and recommendations regarding some of the new language related to the commercial use and possession of native rattlesnakes for biomedical and therapeutic purposes. We hope that these comments will help to finalize these regulatory changes posthaste. Please feel free to contact me if you have any questions, comments or need additional information.

Sincerely,  
James McCabe  
CEO, ZooToxins LLC  
[j.mccabe@zootoxins.com](mailto:j.mccabe@zootoxins.com)

June 26, 2018

State of California Fish and Game Commission  
California Natural Resources Building  
1416 Ninth Street, Room 1320  
Sacramento, CA 95814

Dear Fish and Game Commission,

We at ZooToxins LLC thank you for the opportunity to comment on modified proposed regulations for regulatory action relative to sections 42, 43, 651, and 703, Title 14, California Code of Regulations. We have a number of questions and recommendations regarding some of the new language related to the commercial use and possession of native rattlesnakes for biomedical and therapeutic purposes. For ease of legibility, we will list them individually with a reference and quotation of modified language followed by our response. We hope that these comments will help to finalize these regulatory changes posthaste.

1) Application **42\_DFW1044\_New\_4-2018**; Page 2, Paragraph 2

"Note: Permittees who are not renewing...or WITH 30 days of the business closure"

ZooToxins Comment: There appears to be a typo and WITH should be WITHIN.

2) **42regs2**: Page 2, subsection (d).(4).(A).1.

“1. A resume that provides the dates and description of an applicant’s or their employee's experience **researching and creating products from venom extracted from rattlesnake species or similar experience** **and** working with venomous snakes...”

ZooToxins Comment: The standard here is too strict. First, requiring *both* handling experience with snakes *and* developing products from venom is exorbitant. Some applicants may want to produce venom, but not develop a product, or vice versa. Second, the standard of experience “researching and creating products from venom extracted from rattlesnake species” is extremely specific. Perhaps there are people with experience developing vaccines or antivenoms, but not necessarily from rattlesnake venom. Of course, there should be a standard with which the Department can evaluate people who will not house rattlesnakes, but handle venom to develop and sell therapeutic products.

For applicants who want to develop products from venom, but not house rattlesnakes, the resume should show they are capable of handling venom in accordance with pharmaceutical manufacturing industrial standards. The requirement for the resume could state that applicants disclose, ‘experience in handling biological materials in a way that ensures their quality for use

in the development of therapeutic products.’ This way, applicable experience in sterile technique, work in biochemical laboratories, or other related manufacturing experience would be applicable.

3) **42regs2**: Page 2, subsection (d).(4).(A).3.

“3. A statement of purpose describing in detail the planned uses for the **species native rattlesnakes, including approximate desired maximum quantities of each species being housed at the facility, and their venom.**”

ZooToxins Comment: We cannot determine the need for describing the 'approximate maximum quantity of venom' housed at the facility and would like the phrase, “and their venom” to be removed. First, there is no standard for what a permit applicant should report. Does the permittee report the desired volume of whole liquid venom or fractions of venom? The desired mass of dried venom or dried fractions of venom? Should they report all of these quantities individually or holistically? With what units should they report them? Is there a standard for a desired quantity that is *too high*, and what is that standard? Second, we do not keep extracted venom in our snake facility, so does this mean that we do not need to report our desired maximum amount? Third, it is impossible to estimate how much venom any facility is capable of producing in a given year, so there is no justification for asking about the *desired maximum quantities*. The amount produced relies on a range of factors not limited to, the number of snakes in the colony, the number of extractions performed in the year, the health status of each animal at each extraction, etc. Thinking about what ZooToxins would report to meet this standard, we would likely put down a ridiculous number such as 100L of liquid venom or fractions thereof and 100kg of dried venom or fractions thereof. It would seem easier to just strike the request for this information as it informs nothing about the capacity of the facility to maintain rattlesnakes and is hard to enforce for personnel assessing applications or renewal information.

4) Amended Initial Statement of Reasons for Regulatory Action, **42isor2**, page 4, paragraph 3:

“Subsection (d) of Section 42 specifies requirements...A separate permit is proposed for each facility housing native rattlesnake species or creating products from venom extracted from native rattlesnake species **because the Department must evaluate facility-level specifics such as whether the proposed use plan is consistent with the regulation, staff working there meet the minimum qualifications, and the facility itself appears capable of housing the proposed numbers of rattlesnakes and is reasonably secure.**”

This statement is used to justify the requirement to report the number of snakes (see 42\_DFW1044A-2018). 42isor2, page 4, final paragraph on the page, goes on to say:

“The number of each species of native rattlesnake and how they were acquired are necessary to determine if the proposed plan for commercial use is consistent with the terms of Section 42.”

ZooToxins Comment: As written, this justification is fraught—it states that reporting the number of animals will be used to inform permitting, but there is no description of a standard for evaluation in Section 42. Why report this information if there is no correlation to proper housing



practices? What makes us uncomfortable is that it seems that the department could walk into our facility, decide it is 'not capable of housing the proposed numbers of rattlesnakes' and arbitrarily deny or retract permitting. If this reporting requirement is to remain in the applications and renewal materials, there should be a clear standard included in subsection (f) of Section 42, related to the humane care and treatment of rattlesnakes. Otherwise, the requirement to report such specific information should be removed and the applications adjusted. The individual snake housing requirements described in subsection (f) *should* be a sufficient standard to evaluate if "the facility itself appears capable of housing the proposed numbers of rattlesnakes and is reasonably secure." That is, if the facility can handle enough caging to fulfill the individual housing requirements and there is evidence that the number of animal care staff and their schedule keeps these animals properly maintained, then the absolute number of animals is irrelevant.

We understand that this information may also help determine if a permit holder has become an animal dealer, but the justification is written to ensure quality care of the animals, not to help police the sale of these animals. Thus, there should be clear definitions on how this standard is evaluated by the Department to protect permit holders from arbitrary or subjective permitting decisions and to make it easy for the Department to enforce this policy.

We feel that a comprehensive solution to this fraught justification requires changes to permit applications and to section 42. We know that this is a lot to request; however, it was not apparent that this reporting requirement would be problematic until drafts of the actual forms were finally released in April 2018.

We are glad to provide further explanation in writing or by phone if needed. Again, we thank the Commission for their work in working towards regulatory changes and hope this ends the process soon.

Sincerely,

James McCabe

CEO, ZooToxins LLC  
j.mccabe@zootoxins.com

**Attachment B.**  
**Responses to Public Comments on Proposed Regulations to**  
**Add Section 42 and subsection (a)(2) of Section 703, and**  
**Amend subsection (c) of Section 43 and subsection (a) of Section 651, Title 14, CCR Received by**  
**the Fish and Game Commission Between June 11 and June 26, 2018**

Commenter Name, Date, Format		Comment #		Response #	
1	James McCabe CEO, ZooToxins LLC 6/26/2018 Letter	A.	Application <b>2_DFW1044_New_4-2018</b> ; Page 2, Paragraph 2 "Note: Permittees who are not renewing...or WITH 30 days of the business closure" There appears to be a typo and WITH should be WITHIN.	A.	Correction made.
		B.	<b>42regs2</b> : Page 2, subsection (d).(4).(A).1.  "1. A resume that provides the dates and description of an applicant's or their employee's experience <b>researching and creating products from venom extracted from rattlesnake species or similar experience and</b> working with venomous snakes..."  <u>Comment:</u> (a) The standard here is too strict. First, requiring <i>both</i> handling experience with snakes <u>and</u> developing products from venom is exorbitant. Some applicants may want to produce venom, but not develop a product, or vice versa. (b) Second, the standard of experience "researching and creating products from venom extracted from rattlesnake species" is extremely specific. Perhaps there are people with experience developing vaccines or antivenoms, but not necessarily from rattlesnake venom. Of course, there should be a standard with which the Department can evaluate people who will not house rattlesnakes, but handle venom to develop and sell therapeutic products.] (c) For applicants who want to develop products from venom, but not house rattlesnakes, the resume should show they are capable of handling venom in	B.	(a) 42(d)(A) specifically applies to businesses that are proposing to house rattlesnakes for the purpose of extracting their venom and creating pharmaceutical products. Therefore, the business needs to have people working there that have experience with handling venomous snakes and manufacturing pharmaceutical products. A business can have people who specialize in husbandry, venom extraction, and/or creating pharmaceutical products. Not every person working there must have experience in all facets of the operation, but for a business to be permitted it must have staff that are qualified to carry out the proposed work. (b) The regulation does not require that the person possess experience creating pharmaceutical products from rattlesnake venom. The Department and Commission recognized that this would be nearly impossible, which is why "or similar experience" was included.

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			<p>accordance with pharmaceutical manufacturing industrial standards. The requirement for the resume could state that applicants disclose, 'experience in handling biological materials in a way that ensures their quality for use in the development of therapeutic products.' This way, applicable experience in sterile technique, work in biochemical laboratories, or other related manufacturing experience would be applicable.</p>		<p>(c) 42(d)(B) applies to businesses that are not going to house native rattlesnakes but are only going to make pharmaceutical products from their venom. The requirement for this type of business is that staff working with the venom have experience making pharmaceutical products from rattlesnake venom or similar experience. Experience in handling (non-venom) biological materials in a way that ensures their quality for use in the development of therapeutic products would be considered "similar experience."</p>
		C.	<p><b>42regs2:</b> Page 2, subsection (d).(4).(A).3.  "3. A statement of purpose describing in detail the planned uses for the <b>species native rattlesnakes, including approximate desired maximum quantities of each species being housed at the facility, and their venom.</b>"</p> <p><u>Comment:</u> We cannot determine the need for describing the 'approximate maximum quantity of venom' housed at the facility and would like the phrase, "and their venom" to be removed. First, there is no standard for what a permit applicant should report. Does the permittee report the desired volume of whole liquid venom or fractions of venom? The desired mass of dried venom or dried fractions of venom? Should they report all of these quantities individually or holistically? With what units should they report them? Is there a standard for a desired quantity that is <i>too high</i>, and what is that</p>	C.	<p>The regulation does not require the maximum desired amount of venom to be disclosed. The maximum quantities refers only to the rattlesnakes being housed. Only the planned uses of the venom are required in the statement of purpose.</p> <p>The Commission has revised the sentence (see below) to ensure the purpose is clear.</p> <p>"A statement of purpose describing in detail the planned uses for the <b>native rattlesnakes and their venom, including the approximate desired maximum quantities of each species being housed at the facility.</b>"</p>

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			<p>standard? Second, we do not keep extracted venom in our snake facility, so does this mean that we do not need to report our desired maximum amount? Third, it is impossible to estimate how much venom any facility is capable of producing in a given year, so there is no justification for asking about the <i>desired maximum quantities</i>. The amount produced relies on a range of factors not limited to, the number of snakes in the colony, the number of extractions performed in the year, the health status of each animal at each extraction, etc. Thinking about what ZooToxins would report to meet this standard, we would likely put down a ridiculous number such as 100L of liquid venom or fractions thereof and 100kg of dried venom or fractions thereof. It would seem easier to just strike the request for this information as it informs nothing about the capacity of the facility to maintain rattlesnakes and is hard to enforce for personnel assessing applications or renewal information.</p>		
		<p>D.</p>	<p>Amended Initial Statement of Reasons for Regulatory Action, <b>42is or 2</b>, page 4, paragraph 3:</p> <p>“Subsection (d) of Section 42 specifies requirements...A separate permit is proposed for each facility housing native rattlesnake species or creating products from venom extracted from native rattlesnake species <b>because the Department must evaluate facility-level specifics such as whether the proposed use plan is consistent with the regulation, staff working there meet the minimum qualifications, and the facility itself appears capable of housing the proposed numbers of rattlesnakes and is reasonably</b></p>	<p>D.</p>	<p>The minimum enclosure requirements in 42(f)(1) will be used to determine whether a facility has the spatial capacity to house the approximate maximum number of each species. The Department and Commission do not agree that a modification to the regulatory language is necessary.</p>

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			<p><b>secure.”</b></p> <p>This statement is used to justify the requirement to report the number of snakes (see 42_DFW1044A-2018). 42isor2, page 4, final paragraph on the page, goes on to say:</p> <p>“The number of each species of native rattlesnake and how they were acquired are necessary to determine if the proposed plan for commercial use is consistent with the terms of Section 42.”</p> <p><u>Comment:</u> As written, this justification is fraught—it states that reporting the number of animals will be used to inform permitting, but there is no description of a standard for evaluation in Section 42. Why report this information if there is no correlation to proper housing practices? What makes us uncomfortable is that it seems that the department could walk into our facility, decide it is 'not capable of housing the proposed numbers of rattlesnakes' and arbitrarily deny or retract permitting. If this reporting requirement is to remain in the applications and renewal materials, there should be a clear standard included in subsection (f) of Section 42, related to the humane care and treatment of rattlesnakes. Otherwise, the requirement to report such specific information should be removed and the applications adjusted. The individual snake housing requirements described in subsection (f) <i>should</i> be a sufficient standard to evaluate if "the facility itself appears capable of housing the proposed numbers of rattlesnakes and is reasonably secure." That is, if the facility can handle enough caging to fulfill the</p>		
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**Attachment B.**  
**Responses to Public Comments on Proposed Regulations to**  
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			<p>individual housing requirements and there is evidence that the number of animal care staff and their schedule keeps these animals properly maintained, then the absolute number of animals is irrelevant.</p> <p>We understand that this information may also help determine if a permit holder has become an animal dealer, but the justification is written to ensure quality care of the animals, not to help police the sale of these animals. Thus, there should be clear definitions on how this standard is evaluated by the Department to protect permit holders from arbitrary or subjective permitting decisions and to make it easy for the Department to enforce this policy.</p> <p>We feel that a comprehensive solution to this fraught justification requires changes to permit applications and to section 42. We know that this is a lot to request; however, it was not apparent that this reporting requirement would be problematic until drafts of the actual forms were finally released in April 2018.</p>		
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**State of California  
Office of Administrative Law**

**In re:**  
**Fish and Game Commission**

**Regulatory Action:**

**Title 14, California Code of Regulations**

**Adopt sections: 42**

**Amend sections: 43, 651, 703**

**Repeal sections:**

**DECISION OF DISAPPROVAL OF  
REGULATORY ACTION**

**Government Code Section 11349.3**

**OAL Matter Number: 2018-0801-02**

**OAL Matter Type: Regular Resubmittal  
(SR)**

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**SUMMARY OF REGULATORY ACTION**

On January 24, 2018, the Fish and Game Commission (Commission) submitted to the Office of Administrative Law (OAL) its initial proposed regulatory action (OAL File No. 2018-0124-01S) to adopt and amend sections in Title 14 of the California Code of Regulations. The regulations establish a permit program for the commercial use of native rattlesnakes to develop antivenom, vaccines, and other therapeutic agents. This program includes an application form and fees, species authorized for use, minimum qualifications for applicants and employees, inspection requirements, humane care and treatment standards, emergency plan requirements, and record keeping and reporting obligations. On March 7, 2018, the Commission withdrew this initially submitted file.

The Commission subsequently modified its regulatory text and added an Amended Initial Statement of Reasons (ISOR) to the file. The Commission then made these documents available to the public for comment on June 11, 2018, for a period of 15 days. On August 1, 2018, the Commission resubmitted the proposed regulatory action to OAL for review. On September 13, 2018, OAL notified the Commission that OAL disapproved the proposed regulations because the Commission failed to follow procedures required by the Administrative Procedure Act (APA). This Decision of Disapproval of Regulatory Action explains the reasons for OAL's action.

**DECISION**

OAL disapproved the above-referenced regulatory action because the Commission failed to follow required APA procedures by not considering and approving substantial changes made to the final version of the regulation text, and by not considering a public comment received during the 15-day comment period of June 11, 2018, through June 26, 2018, as required by Government Code section 11346.8, subdivision (a).

## **DISCUSSION**

The Commission's regulatory action must satisfy requirements established by the part of the APA that governs rulemaking by a state agency. (See Gov. Code, sec. 11340 et seq.) Any regulation adopted, amended, or repealed by a state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure, is subject to the APA unless a statute expressly exempts the regulation from APA coverage. (Gov. Code, § 11346.) No exemption applies to the present regulatory action under review.

Before any regulation subject to the APA may become effective, the regulation is reviewed by OAL for compliance with both the procedural requirements of the APA and the standards for administrative regulations in Government Code section 11349.1. (See Gov. Code, sec. 11340.1, subd. (a).) Generally, to satisfy the APA standards, a regulation must be legally valid, supported by an adequate record, and easy to understand. In this review, OAL is limited to the rulemaking record and may not substitute its judgment for that of the rulemaking agency with regard to the substantive content of the regulation. (*Ibid.*) This review is an independent check on the exercise of rulemaking powers by executive branch agencies intended to improve the quality of regulations that implement, interpret, and make specific statutory law, and to ensure that the public is provided with a meaningful opportunity to comment on regulations before they become effective.

### **1. Failure to Obtain Commission Approval of Final Regulation Text After Substantial Changes and Consideration of Public Comments**

The rulemaking file submitted to OAL for this action includes a recording of the October 11, 2017, Commission meeting demonstrating that the members of the Commission voted upon and approved the originally proposed regulation text, which was made available for public comment on August 4, 2017. Subsequent to the Commission's approval, substantial changes were made by Commission staff to the regulation text and the Amended ISOR was added to the rulemaking file. The modified regulation text and the Amended ISOR were made available June 11, 2018, through June 26, 2018, for a 15-day comment period, during which a public comment was received by Commission staff. Government Code section 11346.8, subdivision (a) states:


(a) ... The state agency shall consider all relevant matter presented to it before adopting, amending, or repealing any regulation.

Since the Commission is the governing body and the entity granted the rulemaking authority in this matter (Fish and Game Code, §§ 200, 5061), the rulemaking file must include documentation that after consideration of all relevant matter, including any public comment, the Commission approved the final version of the regulation text, including all substantial changes. (Gov. Code, § 11347.3, subd. (b)(8).) The Commission staff made substantial changes to the regulations which were noticed in a 15-day comment period and a comment was received; therefore, the Commission was required to subsequently adopt the regulation text as amended after consideration of that comment, but did not do so. Thus, the Commission failed to follow the required APA procedures because the Commission did not consider all relevant matter and vote upon and approve the final version of the regulation text.

**CONCLUSION**

For these reasons, OAL disapproved the above-referenced rulemaking action. Pursuant to Government Code section 11349.4(a), the Commission may resubmit this rulemaking action within 120 days of its receipt of this Decision of Disapproval. A copy of this Decision was emailed to the Commission on the date indicated below. If you have any questions, please do not hesitate to contact me at (916) 323-7465.

Date: September 20, 2018

  
Amy R. Gowan  
Attorney

For: Debra M. Cornez  
Director

Original: Valerie Termini, Executive Director  
Copy: Sherrie Fonbuena

## Proposed Regulatory Language

Add Section 42, to Title 14, CCR:

### **Section 42. ~~Protected Reptiles~~ Commercial Use and Possession of Native Rattlesnakes for Biomedical and Therapeutic Purposes.**

(a) Except as otherwise provided in these regulations, it shall be unlawful for persons without a valid Commercial Native Rattlesnake Permit issued by the department to:

(1) possess, propagate, exchange, or transport native rattlesnakes for commercialized venom extraction;

(2) sell, import, or export native rattlesnake venom or products derived from native rattlesnake venom for commercial purposes; or

(3) purchase native rattlesnakes from a biological supply house, permitted through Section 651, for the purpose of developing and selling biomedical and therapeutic products.

#### **(b) Consistency with Federal, State, and Local Laws.**

A permit issued pursuant to this section does not supersede any federal, state, or local law regulating or prohibiting native rattlesnakes or the activities authorized in a Commercial Native Rattlesnake Permit.

#### **(c) Authorized Native Rattlesnake Species.**

A Commercial Native Rattlesnake Permit may be issued pursuant to this section for the following native rattlesnake species, including their subspecies and taxonomic successors:

(1) Western diamond-backed rattlesnake (*Crotalus atrox*),

(2) Mohave rattlesnake (*Crotalus scutulatus*),

(3) Western rattlesnake (*Crotalus oreganus*),

(4) Southwestern Speckled Rattlesnake (*Crotalus pyrrhus*),

(5) Sidewinder (*Crotalus cerastes*), and

(6) Panamint rattlesnake (*Crotalus stephensi*).

#### **(d) Permit Application and Fees.**

(1) Application form 2018 COMMERCIAL NATIVE RATTLESNAKE PERMIT APPLICATION (DFW 1044 (NEW 9/2018)) for a permit shall be completed in its entirety and submitted with the permit and nonrefundable inspection fees as specified in Section 703.

Application forms are available on the department's website at [www.wildlife.ca.gov](http://www.wildlife.ca.gov).

(2) Duration of Permit. Permits issued under this section shall be valid from January 1 through December 31 each year, or if issued after the beginning of that term, for the remainder thereof.

Applications for renewal must be received by the department no later than November 1.

(3) Permitted facilities. A natural person shall obtain a separate Commercial Native Rattlesnake Permit for each facility housing native rattlesnake species or creating products from venom extracted from native rattlesnake species described in subsection (c) for purposes described in subsection (a).

(4) Qualifications. The following information and documents shall accompany an application for each new permit or renewal unless specified as exempt or as specifically required:

(A) For an application that proposes housing live native rattlesnake species and will develop products derived from venom extracted from native rattlesnake species:

1. A resume that provides the dates and description of an applicant's or their employee's experience researching and creating products from venom extracted from rattlesnake species or similar experience and working with venomous snakes and husbandry of captive snakes, demonstrating the following qualifications:

a. Possess a minimum of 1000 hours experience with captive husbandry of snakes within five (5) years of the date of application; and



- b. Possess a minimum of 200 hours of experience working with captive rattlesnakes or other venomous snakes within five (5) years of the date of application.
2. A letter of reference from an expert in venomous snake captive husbandry and research, dated within five (5) years of the date of application, on letterhead stationery with an original signature signed in ink by the owner or operator of a facility where the applicant or their employee gained his/her experience. The letter shall provide the printed name of the owner or operator and detailed information regarding the quality and extent of the applicant's or their employee's knowledge and experience related to the permit requested.
3. A statement of purpose describing in detail the planned uses for the native rattlesnakes and their venom, including the approximate desired maximum quantities of each species being housed at the facility.
4. A written Emergency Action Plan as specified in subsection (g).
5. Proof that the applicant and staff working with, and directly supervising staff working with, native rattlesnakes and their venom are at least 18 years of age at the time of application.
- (B) For an application that does not propose housing live native rattlesnakes and will only develop products derived from venom extracted from native rattlesnake species:
1. A resume that provides the dates and description of an applicant's or their employee's experience researching and creating products from venom extracted from rattlesnake species or similar experience.
2. A letter of reference from an expert in venomous snake research, dated within five (5) years of the date of application, on letterhead stationery with an original signature signed in ink by the owner or operator of a facility where the applicant or their employee gained his/her experience. The letter shall provide the printed name of the owner or operator and detailed information regarding the quality and extent of the applicant or their employee's knowledge and experience related to the permit requested
3. A statement of purpose describing in detail the planned uses for the venom.
4. Proof that the applicant and staff working with, and directly supervising staff working with, native rattlesnake venom are at least 18 years of age at the time of application.
- (e) General Conditions.**
- (1) At least one natural person who meets the minimum qualifications, as defined in subsection (d), shall be present whenever rattlesnakes are being handled or venom is being processed.
- (2) Native rattlesnakes possessed pursuant to this section shall not be sold but may be transferred to or exchanged with a natural person with a valid Commercial Native Rattlesnake Permit. The receiving permittee may be charged only to recover actual transportation and shipping costs.
- (3) Native rattlesnakes that have been in captivity, including wild-caught and captive-bred individuals or offspring, shall not be released into the wild.
- (4) Inspections.**
- (A) The facility must pass an initial inspection to ensure the requirements of this section are met before the department will issue a permit.
- (B) The department may enter the facilities of any permittee where native rattlesnakes are housed, or reasonably may be housed, at any reasonable hour to inspect the animals and their enclosures and to inspect, audit, or copy records required by this section.
- (C) The department may deny the issuance of, or immediately suspend, the permit of a permittee who refuses to allow inspection of a facility, permit, book, or other record required to be kept by the permittee. A refusal to allow inspection may be inferred if, after reasonable attempts by the department, the permittee does not make the facility, permit, book, or other record available for inspection. The department may reinstate a permit suspended pursuant to this subsection if the permittee allows the department to inspect the facility, permit, book, or other record and no violations of these regulations or any permit condition are observed during that inspection.

(5) Denial. The department shall deny a Commercial Native Rattlesnake Permit initial application or renewal application for any applicant who fails to comply with any provision in this regulation, and may deny an initial application or renewal application for any applicant who violates the Fish and Game Code, Title 14 regulations, any term or condition of a Commercial Native Rattlesnake Permit, or any other state or federal statute or regulation pertaining to wildlife or animal cruelty. Within 30 calendar days of a denial, an applicant may submit a written request for a hearing before the commission to show cause why his/her permit should be issued.

(6) Revocation. Any permit issued pursuant to these regulations may be suspended or revoked at any time by the department as described below.

(A) For a permittee who has been convicted in a court of competent jurisdiction of violating the Fish and Game Code, Title 14 regulations, or any other state or federal statute or regulation pertaining to wildlife or animal cruelty, the suspension or revocation shall take effect when the permittee receives a notice of suspension or revocation. The permittee may submit a written request to the commission for a hearing to show cause why his/her permit should be reinstated.

(B) For a permittee who has violated the Fish and Game Code, Title 14 regulations, any term or condition of a Commercial Native Rattlesnake Permit, or any other state or federal statute or regulation pertaining to wildlife or animal cruelty, but has not been convicted of any such violation, the suspension or revocation shall not take effect unless 15 calendar days have passed from the date the permittee receives an accusation sent pursuant to Government Code Section 11503, and the permittee has not submitted to the commission a notice of defense described in Government Code Section 11506. If a permittee submits a timely notice of defense, the suspension or revocation shall take effect if, after a commission hearing, the commission finds by a preponderance of evidence that the department's suspension or revocation is warranted.

**(f) Humane Care and Treatment.** Permitted facilities that house live native rattlesnakes shall comply with the following provisions:

(1) Enclosures. The perimeter of the enclosure for snakes 33 inches in length or less shall be 1.5 times the length of the snake. The perimeter of the enclosure for snakes more than 33 inches in length shall be 1.25 times the length of the snake. The perimeter shall be measured on the inside of the top edge of the enclosure. Snakes may be kept in smaller cages or containers for 31 calendar days from the date of birth and while being transported. All enclosures shall be adequately ventilated. The substrate shall facilitate the ability to maintain a clean and healthy environment for each animal.

(2) Food. Food shall be wholesome, palatable and free from contamination and shall be supplied in sufficient quantity and nutritive value to maintain the animal in good health.

(3) Water. Potable water shall be accessible to the animals at all times or provided as often as necessary for the health and comfort of the animal. All water receptacles shall be clean and sanitary.

(4) Cleaning of enclosures. Excrement shall be removed from enclosures as often as necessary to maintain animals in a healthy condition.

(5) Disinfection of enclosures. All enclosures shall be disinfected after an animal with an infectious or transmissible disease is removed from an enclosure.

(6) Pest control. Programs of disease prevention and parasite control, euthanasia and adequate veterinary care shall be established and maintained by the permittee.

(7) Observation. Animals shall be observed at least twice a week by the permittee or once a week if the animals are in hibernation. Sick, diseased, stressed, or injured animals shall be provided with care consistent with standards and procedures used by veterinarians or humanely destroyed.

(8) Handling. Animals shall be handled carefully so as not to cause unnecessary discomfort, behavioral stress, or physical harm to the animal.

**(g) Emergency Action Plan.**

(1) Every Commercial Native Rattlesnake permittee that houses live native rattlesnakes shall have a written Emergency Action Plan readily available, posted in a conspicuous place, and shall submit a

copy to the department with the initial permit and renewal application. The Emergency Action Plan shall be titled, state a revision date and emergency telephone numbers including the local department regional office, 911, and local animal control agencies, updated annually, and include, at a minimum, the following items:

(A) List of the re-capture equipment available;

(B) Description of humane lethal dispatch methods and a list of qualified personnel who are trained to carry out the methods;

(C) List of medical supplies/first aid kits and where they are located;

(D) Description of mobile transport cages and equipment on hand;

(E) Written plan of action for emergencies to include but not be limited to rattlesnake bites, escape of rattlesnakes, and emergency facility evacuations.

(2) Permittees are responsible for the capture, and for the costs incurred by the department related to capture or elimination of the threat, of an escaped rattlesnake or the use of humane lethal force required to capture a rattlesnake that escapes.

(3) Any incident involving a rattlesnake held under a Commercial Native Rattlesnake Permit that results in serious injury or death to a natural person shall be reported immediately to the nearest department regional office. If the department determines that serious injury or death has occurred as a result of contact with a rattlesnake, the permit may be reviewed and subject to change by the department. Additional conditions to the permit may be added at any time to provide for public health and safety.

(4) Permittees shall immediately report by telephone the escape of a rattlesnake possessed pursuant to this section to the nearest department regional office and the nearest law enforcement agency of the city or county in which the rattlesnake escaped.

**(h) Records.** Every permittee that houses live native rattlesnakes shall keep accurate accounting records for three (3) years from most recent issuance or renewal of the permit in which all of the following shall be recorded:

(1) The complete scientific name and number of all native rattlesnakes purchased, propagated, transferred, exchanged, died and possessed.

(2) The person from whom the native rattlesnakes were purchased, exchanged or transferred.

(3) The person to whom the native rattlesnakes were exchanged or transferred.

(4) The date that the native rattlesnakes were purchased, exchanged, transferred, propagated or died.

(5) All required records shall be legible and in the English language and maintained within the State of California.

**(i) Annual Reporting Requirement.** No permit shall be renewed unless the permittee submits the record specified in Section 703, on or before November 1 of each year. The permittee must submit the record even if there is zero activity to report, or the permittee is not going to renew the permit. If the permittee is not going to renew the permit, the record specified in Section 703 must be submitted on or before December 31 or within 30 days of the business closing.

**(j) Shipments.** All deliveries or shipments of live native rattlesnakes taken under authority of this section shall have a legible copy of the valid permit attached to the outside of the shipping container, which shall be conspicuously labeled: "Live Rattlesnakes - Handle With Care". This subsection does not supersede any federal, state, or local law or regulation or shipper's requirements concerning shipment of live rattlesnakes.

Note: Authority cited: Sections 200, 202, 205, 210, 219 and 2205061, Fish and Game Code.

Reference: Sections 200-202, 205, 206, 210, 215, 219 and 2205060 and 5061, Fish and Game Code. Section 597, Penal Code. Sections 11503 and 11506, Government Code.

Subsection (c) of Section 43, Title 14, CCR, is amended to read as follows:

**§ 43. Captive Propagation and Commercialization of Native Reptiles.**

*... No proposed changes to subsections (a) and (b)*

(c) Propagation and Possession for Commercial Purposes. Native reptiles may not be sold, possessed, transported, imported, exported or propagated for commercial purposes, except as provided in ~~Section 40(f), and except~~ sections 40(f) and 42 and except as follows:

*... No proposed changes to subsections (c)(1), (c)(2), and (d) through (k)*

Note: Authority cited: Sections 200, 205, 265, 275, 5061 and 6896, Fish and Game Code. Reference: Sections 200, ~~205, 265, 205, 265,~~ 205, 265, 275, 5061 and 6896, Fish and Game Code.

Subsection (a) of Section 651, Title 14, CCR, is amended to read as follows:

**§ 651. Commercial Take of Native Reptiles and Amphibians for Scientific or Educational Institutions.**

(a) Native reptiles and amphibians may be sold to scientific or educational institutions only by owners of biological supply houses who have been issued a permit by the department for such purposes. A natural person who holds a valid Commercial Native Rattlesnake Permit pursuant to Section 42 or an out-of-state commercial developer of biomedical and therapeutic agents shall be considered a scientific or educational institution for the purposes of this section.

*... No proposed changes to subsections (a)(1), (a)(2), (a)(3), and (b) through (i)*

Note: Authority cited: Sections 1002, 5061, 6851 and 6896, Fish and Game Code. Reference: Sections 1002, 5050, 5060, 5061, 6850, 6852, ~~6854-6855~~ 6854, 6855, 6895 and 6896, Fish and Game Code.

Subsection (a)(2) of Section 703, Title 14, CCR is added as follows:

**§ 703. Miscellaneous Applications, Tags, Seals, Licenses, Permits, and Fees.**

(a) Applications, Forms and Fees for January 1 through December 31 (Calendar Year).

*...No proposed changes to subsection (a)(1))*

(2) Commercial Permit for Native Rattlesnakes

(A) 2018 Commercial Native Rattlesnake Permit Application, DFW 1044 (NEW 9/2018), incorporated by reference herein.

1.	<u>Commercial Native Rattlesnake Permit Fee (New)</u>	<u>\$ 208.50</u>
2.	<u>Commercial Native Rattlesnake Permit Fee (Renewal)</u>	<u>\$ 113.00</u>

3. Fee for one initial inspection per facility \$ 606.50

(B) Commercial Native Rattlesnake Permit Record, DFW 1044A (NEW 4/2018), incorporated by reference herein.

*...No proposed changes to subsections (a)(3), (b) and (c).*

Note: Authority cited: Sections 713, 1002, 1002.5, 1050, ~~1053, 1055, 1745~~, 2118, 2120, 2122, 2150, ~~2150.2 and 2157~~, 2157 and 5060, Fish and Game Code. Reference: Sections 395, 396, 398, 713, 1002, 1002.5, 1050, ~~1053, 1745~~, 2116, 2116.5, 2117, 2118, 2120, 2125, 2150, 2150.2, 2150.4, 2151, 2157, 2190, 2193, 2271, 3005.5, 3007, 3503, 3503.5, 3511, 3513, 3950, 5060, 5061, 10500, 12000 and 12002, Fish and Game Code; and Title 50, Code of Federal Regulations, Parts 21.29 and 21.30.



**2019 COMMERCIAL NATIVE RATTLESNAKE PERMIT APPLICATION**

DFW 1044 (NEW 9/2018)

**VALID JANUARY 1, 2019 THROUGH DECEMBER 31, 2019** (If issued after January 1, valid on date of issuance)**PERMIT FEE PER FACILITY:** ☐ **NEW \$208.50** ☐ **RENEWAL: \$113.00** ☐ **INSPECTION FEE: \$606.50** (New facilities only)

(Fee includes a nonrefundable three percent (3%) application fee, not to exceed \$7.50)

**NOTE: AN INITIAL INSPECTION IS REQUIRED FOR NEW PERMITS PRIOR TO THE PERMIT BEING ISSUED. IF YOU ARE NOT GOING TO HOUSE NATIVE RATTLESNAKES, AN INITIAL INSPECTION IS NOT REQUIRED.****IMPORTANT: If you will not be housing native rattlesnakes but will be developing products derived from native rattlesnake venom, please check the box below. See instructions on reverse. Type or print clearly.**

FIRST NAME	M.I.	LAST NAME	GO ID NUMBER (FROM ALDS ISSUED LICENSE)
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BUSINESS NAME (If applicable)

MAILING ADDRESS	COUNTY	DAY TELEPHONE ( )
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CITY	STATE	ZIP CODE	EMAIL ADDRESS
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SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	HAIR COLOR	EYE COLOR	HEIGHT (Ft., In.)	WEIGHT	DATE OF BIRTH
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FACILITY ADDRESS	COUNTY	FACILITY TELEPHONE ( )
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CITY	STATE	ZIP CODE	FACILITY EMAIL ADDRESS
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LIST CUMULATIVE TOTALS OF ALL NATIVE RATTLESNAKES IN POSSESSION (Attach additional pages if necessary)

**\*New Applicants: For rattlesnakes to be acquired, complete as "TBA".**

Qty.	Common Name	Scientific Name (Include sub-species)	Date Acquired or TBA*	Acquired Source

☐ I am not housing native rattlesnakes and will only be developing products derived from venom extracted from native rattlesnake species.

I certify that I have read, understand, and agree to abide by, all conditions of this permit, the applicable provisions of the Fish and Game Code (FGC), and the regulations promulgated thereto. I certify that I am not currently under any Fish and Wildlife license or permit revocation or suspension, and that there are no other legal or administrative proceedings pending that would disqualify me from obtaining this permit. I agree that if I make any false statement as to any fact required as a prerequisite to the issuance of this permit, the permit is void and will be surrendered where purchased, and I understand that I may be subject to prosecution pursuant to FGC Section 1054 or to other administrative actions pursuant to Section 746, Title 14, of the CCR.

SIGNATURE	DATE
-----------	------

**X****FOR DEPARTMENT OF FISH AND WILDLIFE USE ONLY**

REVIEWED BY/DATE	TRANSACTION #	ISSUED BY/DATE
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**NEW APPLICANTS - YOU MUST INCLUDE A COPY OF YOUR IDENTIFICATION WITH THIS APPLICATION**



**INSTRUCTIONS FOR COMPLETING THE COMMERCIAL NATIVE RATTLESNAKE PERMIT APPLICATION**

Please allow 60 calendar days for processing the application. This permit covers the commercial use and possession of native rattlesnakes for biomedical and therapeutic purposes. Records must be kept in accordance with Section 42(h), Title 14, of the CCR. A copy of the Commercial Native Rattlesnake Permit Record (form DFW 1044A) shall be submitted to the Department with renewal application by November 1<sup>st</sup> of each year. No permit shall be renewed unless the completed Commercial Native Rattlesnake Permit Record is submitted.

**NOTE: PERMITTEES WHO ARE NOT RENEWING THEIR PERMITS MUST SUBMIT A COMMERCIAL NATIVE RATTLESNAKE PERMIT RECORD BY DECEMBER 31<sup>ST</sup> OR WITHIN 30 DAYS OF THE BUSINESS CLOSURE.**

**IMPORTANT: If you are not housing native rattlesnakes but will be developing products derived from native rattlesnake venom, please check the box above the signature line.**

**NEW APPLICANTS:** You must be at least 18 years of age. You must have your permanent rattlesnake housing facility built and ready to be inspected by the Department when you submit this application. Submit the inspection fee, as specified in Section 703 with this application. If the permitted facility houses native rattlesnake species, your permanent rattlesnake housing facility must pass an inspection by the Department, as specified in Section 42(e), before your permit may be issued. The Department will contact you to schedule an appointment to have your facility inspected.

**IMPORTANT:** Incomplete applications will be returned and could delay the issuance of your permit. Contact the License and Revenue Branch at (916) 928-5853 or [spu@wildlife.ca.gov](mailto:spu@wildlife.ca.gov) if you need additional information regarding Commercial Native Rattlesnake Permits.

1. It is mandatory to complete all items.
2. If renewing your permit, you must submit a completed Commercial Native Rattlesnake Permit Record (DFW 1044A).
3. A resume that provides the dates and description of an applicant's or their employee's experience working with venomous snakes or snake venom and meeting the minimum qualifications, as described in Section 42(d).
4. Proof that you and any employees involved in handling rattlesnakes or their venom are at least 18 years of age, as described in Section 42(d).
5. A letter of reference, as described in Section 42(d).
6. A statement of purpose, as described in Section 42(d).
7. A copy of your Emergency Action Plan for each facility, as described in Section 42(g).
8. Sign and date the application.
9. Mail this application, the Commercial Native Rattlesnake Permit Record (renewals only), a copy of identification, all required attachments listed above, and a cashier's check, money order, personal or business check\* or credit card\*\* authorization form with the appropriate fee to the Department of Fish and Wildlife, License and Revenue Branch, 1740 N. Market Blvd., Sacramento, CA 95834 or apply in person. **DO NOT SEND CASH.**\*\*\*

**INDIVIDUAL AND BUSINESS IDENTIFICATION REQUIREMENTS**

Section 700.4(c), Title 14, of the California Code of Regulations (CCR) states any applicant applying for any license, tag, permit, reservation or other entitlement issued via the Automated License Data System (ALDS) shall provide valid identification.

All business applicants must provide documentation identifying the business' structure type. Acceptable forms of business identification include:

- Articles of Incorporation
- Statement of Partnership
- Registration as a Limited Liability Partnership; or
- Certificate of Limited Partnership
- Statement of Partnership Authority
- Statement of Sole Proprietorship

If a business' identification names individual(s), each individual must provide a valid individual identification and provide their date of birth, sex, hair and eye color, height and weight.

**NOTICE**

**Disclosure Statement** - Under Section 42, Title 14, of the CCR, the Department of Fish and Wildlife is authorized to collect information from applicants to maintain a record of licensure. All information requested on this application is mandatory unless otherwise indicated. An applicant's name and city of residence may be provided to the public if requested. Other personal information submitted on this application may be released for law enforcement purposes, pursuant to court order, or for official natural resources management purposes.

A licensee may obtain a copy of his/her license records maintained by the Department by submitting a written request to the Custodian of Records, Department of Fish and Wildlife, License and Revenue Branch, 1740 N. Market Blvd., Sacramento, CA 95834. All requests must include the requester's name, address, and telephone number.

**PAYMENT POLICY**

\* **Personal or business checks** will be accepted by the Department if name and address are imprinted on the check. Checks returned to the Department due to insufficient funds will render your permit invalid. The Department may also deny the issuance or renewal of any permit if a person has failed to reimburse the Department for the amount due. Any activity performed without a valid permit is a violation of the Fish and Game Code and therefore subject to enforcement action.

\*\* **Credit Cards**—Licenses, permits, tags, stamps, or registrations may be purchased with a Visa or MasterCard.

\*\*\***Cash** will no longer be accepted at California Department of Fish and Wildlife offices starting January 1, 2017.



1. Complete the record in full including first name, middle initial, last name, GO ID#, permit #, and permit year.
2. Enter the date, scientific name and number of native rattlesnakes that were purchased, propagated, transferred, exchanged, died, total possessed and the recipients or sellers name.  
**NOTE: "Total Possessed" is the complete inventory of each species per facility.**
3. Check the appropriate box if you are no longer doing the activities which require renewal of the permit, are submitting a "zero" record or do not house native rattlesnakes.  
**IMPORTANT! If you are no longer doing the activities which require renewal of the permit, or are submitting a "zero" record, you are still required to submit final reports by December 31 or within 30 days of the business closing.**
4. Sign and date the record.
5. Mail the record to the Department of Fish and Wildlife, License and Revenue Branch, 1740 N. Market Blvd., Sacramento, CA 95834.

FIRST NAME	M.I.	LAST NAME	GO ID#	PERMIT#	YEAR

**THIS RECORD MUST BE CURRENT AT ALL TIMES**

[illegible]

- ☐ I do not house native rattlesnakes and only develop products derived from venom extracted from native rattlesnake species.
- ☐ I am no longer doing the activities which require renewal of the permit and am submitting my final report.
- ☐ I have no activity to report and am submitting a “zero” record.

*I certify that all information on this report is true and correct to the best of my knowledge.*

SIGNATURE	DATE
X	

2018 AUG 29 AM 9:35

## Memorandum

Date: August 28, 2018

To: Valerie Termini  
Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Request for 6 Month Extension, Cascades Frog Status Review**

Per Section 2074.6 of the Fish and Game Code, the California Department of Fish and Wildlife (Department) requests an extension of time, by 6 months, to further analyze and evaluate available science, to undergo the peer review process, and to complete the Cascades Frog status review. Such an extension would change the due date of the Department's report to April 27, 2019, which is 18 months from the date the candidacy findings were published (October 27, 2017).

If you have any questions or need additional information, please contact Kari Lewis, Wildlife Branch at (916) 445-3789.

ec: Stafford Lehr  
Deputy Director  
Wildlife and Fisheries Division  
[Stafford.Lehr@wildlife.ca.gov](mailto:Stafford.Lehr@wildlife.ca.gov)

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**From:** FGC  
**Sent:** Monday, July 23, 2018 10:54 AM  
**To:** Tiemann, Sheri@FGC  
**Cc:** Termini, Valerie@FGC; Cornman, Ari@FGC  
**Subject:** FW: Revised Karuk CESA petition for Upper Klamath Trinity River Spring Chinook  
**Attachments:** 18-07-23 FINAL signed CA ESA petition UKTR Spring Chinook.pdf

See the attached petition.

**From:** craig tucker  
**Sent:** Sunday, July 22, 2018 2:00 PM  
**To:** FGC <FGC@fgc.ca.gov>; Wildlife DIRECTOR <DIRECTOR@wildlife.ca.gov>  
**Cc:**

**Subject:** Revised Karuk CESA petition for Upper Klamath Trinity River Spring Chinook

Director Bonham and Director Termini:

Please accept the attached revised petition from Karuk Tribe and Salmon River Restoration Council for CESA listing of Upper Klamath Trinity River Spring Chinook, aka Klamath Trinity Spring Chinook.

Please contact me if you have any questions.

Regards,

S. Craig Tucker, Ph.D.



**A PETITION TO THE STATE OF CALIFORNIA  
FISH AND GAME COMMISSION**

For action pursuant to Section 670.1, Title 14, California Code of Regulations (CCR) and Sections 2072 and 2073 of the Fish and Game Code relating to listing and delisting endangered and threatened species of plants and animals.

**I. SPECIES BEING PETITIONED:**

Common Name: Klamath Trinity Spring Chinook, Upper Klamath-Trinity River spring Chinook

Scientific Name: (*Oncorhynchus tshawytscha*)

**II. RECOMMENDED ACTION:**

(Check appropriate categories)

a. List ☒ b. Change Status ☐

As Endangered ☒ from

As Threatened ☐ to

Or Delist ☐

**III. AUTHORS OF PETITION:**

Name: Russell "Buster" Attebury, Chairman

*I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.*

Signature:

*Rll A. Attebury*

Date:

*7-16-18*

### III. AUTHORS OF PETITION:

Name: Karuna Greenberg

Address: Salmon River Restoration Council  
25631 Sawyers Bar Road  
Sawyers Bar, CA 96027

Email: karuna@srrc.org

Phone Number: 530.462.4665

*I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.*

Signature:



Date:

7/20/2018

## PETITION TO THE STATE OF CALIFORNIA FISH AND GAME COMMISSION SUPPORTING INFORMATION FOR

Klamath Trinity Spring Chinook,  
Klamath Trinity spring-run Chinook  
Upper Klamath-Trinity River spring-run Chinook  
Upper Klamath-Trinity River Spring Chinook

### Common Name

(*Oncorhynchus tshawytscha*)

### Scientific Name

## EXECUTIVE SUMMARY

Petitioners Karuk Tribe and Salmon River Restoration Council submit this petition to list the Upper Klamath Trinity River Spring Chinook (*Oncorhynchus tshawytscha*) hereinafter referred to as UKTR Spring Chinook, as an endangered species under the California Endangered Species Act (CESA) pursuant to the California Fish and Game Code §§ 2070 et seq. This petition demonstrates that the UKTR Spring Chinook warrants listing under CESA based on the factors specified in the statute.

In 2011, Center for Biological Diversity (CBD) et al. filed a Federal Endangered Species Act (ESA) listing petition (2011 Petition) with the National Marine Fisheries Service (NMFS) to address the dramatic declines of Upper Klamath-Trinity River (UKTR) spring-run Chinook salmon. The petition was denied due to NMFS' belief that scientific evidence did not warrant reclassification of the spring-run component of UKTR Chinook as its own Evolutionarily Significant Unit (ESU) under the Endangered Species Act (ESA). However, new evidence demonstrates sufficient differentiation between the spring-run component of UKTR Chinook, referred to here as UKTR Spring Chinook, and their fall-run counterparts, to warrant the UKTR Spring Chinook's classification as its own ESU. On that basis, the Karuk Tribe and Salmon River Restoration Council petitioned NMFS on November 2, 2017 to reconsider its decision and list the UKTR Spring Chinook as endangered. The evidence supporting the Federal listing also supports listing the UKTR Spring Chinook as an endangered species under CESA.

UKTR Spring Chinook used to be abundant in Klamath Watershed and are important to the culture, health, and economy of the Karuk Tribe. Their survival as a species in California is threatened due to the destruction of their habitat or range, construction of dams and water diversions, disease, predation, non-existent or limited regulations, and other causes. Further information on the plight of the UKTR Spring Chinook is detailed below and in the 2011 Petition. Both the 2011 Petition and the 2017 Petition to NMFS are attached hereto and incorporated by reference. The condition of the UKTR Spring Chinook has deteriorated further since the rejection of the 2011 Petition.

For purposes of this document, UKTR Spring Chinook refers to all spring run Chinook salmon in the Klamath Basin. Within this document, UKTR Spring Chinook may also be referred to by the following names: spring-run Chinook, spring run Chinook, spring Chinook, Upper Klamath spring Chinook, UKTR spring Chinook, Trinity spring Chinook.

UKTR Spring Chinook survival is threatened by any one or a combination of the following factors (as listed in Section 670.1, Title 14, CCR):

(1) present or threatened modification or destruction of its habitat;

Historically, UKTR Spring Chinook over summered and spawned in the Williamson, Sprague, and Wood River systems of southern Oregon (Hamilton et al. 2005). The construction of a complex of hydropower dams between 1917 and 1962 created a barrier to fish passage near the California/Oregon border, effectively denying salmonids access to approximately half the Klamath Basin ("Klamath Facilities Removal

Final Environmental Impact Statement/Environmental Impact Report” 2012). Young’s dam on the Scott River and Dwinnell Dam on the Shasta River also serve to deny access to historic UKTR Spring Chinook habitat (Moyle et al., 2017).

Between 1870 and the 1950’s large scale placer mining, including hydraulic and dredge mining, severely altered critical spawning and rearing habitat for UKTR Spring Chinook in the middle Klamath and its tributaries. One of the most important factors leading to the decline and continued low abundance of coho and UKTR Spring Chinook is the legacy effect of historical placer mining on channel and floodplain habitat conditions throughout the mainstem and larger tributaries of the Klamath River (Stumpf 1979). Hydraulic and dredge placer mining in the Salmon River between about 1870 and 1950, for example, led to profound and lasting changes, eroding over 1,859 acres adjacent to the mainstem and larger tributary channels and delivering an estimated 20.3 million cubic yards of sediment to the river (Hawthorne 2017, de la Fuente and Haessig 1993). Placer mining denuded floodplains and adjacent river terraces and hillslopes, reduced riparian shade cover, and exposed the stream channel and surrounding areas to increased solar radiation. (Stillwater Sciences 2018)

In addition, numerous irrigation projects throughout the Klamath Basin impact fish passage, impair water quality, and impair river and stream flows, all of which contribute to decline of UKTR Spring Chinook populations.

(5) disease;

In 2014 and 2015, 81% and 90% of juvenile Chinook salmon sampled were infected with the lethal parasite *Ceratonova shasta*. These high rates of infection were the result of poor water quality, low flows, and prolonged absence of flushing flows necessary to scour the river bed (Hillemeier et al. 2017). These observations led Tribes and conservation groups to file suit against the Bureau of Reclamation and National Marine Fisheries Service resulting in re-consultation on the Klamath Irrigation Project operations plan.

(6) other natural events or human-related activities.

As noted above, a century of dams, diversions, and mining has been a leading cause of UKTR Spring Chinook declines.

## **1. POPULATION TRENDS**

Long-term population abundance data are limited for anadromous Klamath River salmonids. The earliest data primarily consist of catch records for Chinook salmon from early 20th century canneries (NMFS 2009). The data and information on Chinook salmon indicate that population levels have declined significantly since the early 20th century. NMFS 2009 review of all Klamath Basin salmonids reports that, “despite the lack of cohesive long-term data sets to assess population trends, the data that do exist indicate significant population declines in all species throughout the 1900s, leading to a current state of low abundance. Currently, a significant portion of Chinook salmon and Coho salmon that return to spawn in the Klamath River Basin are fish that were spawned in hatcheries” (NMFS 2009).

### *Spring run*

UKTR Spring Chinook salmon in the Upper Klamath Basin are at extremely low abundances compared to their historical status and their current low numbers make them vulnerable to extinction. This is stated clearly in the recent status review of salmon, steelhead, and trout in California:

The numbers of spring Chinook in the Klamath and Trinity River have remained at low levels for the past 20 years with no obvious trends, but numbers are so low...that extirpation is a distinct possibility (Moyle et al. 2008).

Similarly, NMFS (2009) acknowledges the compromised status of spring runs in the Klamath Basin based on their unique life history and the resulting dangers to survival:

Spring run Chinook salmon enter the Klamath River from April to June of each year before migrating to smaller headwater tributaries. They require cold, clear rivers and streams with deep pools to sustain them through the warm summer months. These areas have been greatly reduced in the Basin due to dams and degradation of habitat. The spring Chinook salmon run was historically abundant and may have been the dominant run prior to commercial harvest commencing in the mid-1800s. Wild spring run Chinook salmon populations are now a remnant of their historical abundance and primarily occur in the South Fork Trinity River and Salmon River Basins (NMFS 2009)

UKTR Spring Chinook were historically abundant in the Klamath River Basin and have since declined significantly due to a variety of threats. Moyle et al. (2008) state, "while it is likely that UKTR spring Chinook were historically the most abundant run in the Klamath and Trinity Rivers (Snyder 1931, LaFauce 1967), by the time records were being kept seriously, they had been reduced to a minor component of Klamath salmon." In the past, populations of spring-run Chinook in the Basin likely totaled over 100,000 fish (Moyle 2002). The spring run was apparently the main run of Chinook salmon in the Klamath River until it declined steeply in the 19<sup>th</sup> century as a result of hydraulic mining, dams, diversions and fishing (Snyder 1931).

In each of four main Klamath tributaries (Sprague, Williamson, Shasta, and Scott Rivers), historic run sizes were estimated by CDFG (1990) to be at least 5,000. The runs in the Sprague, Wood, and Williamson Rivers were probably extirpated in 1895 after the construction of Copco 1 Dam (Moyle et al. 2008).

In 1968, efforts to maintain a UKTR Spring Chinook run through artificial propagation of native stock at the Iron Gate Hatchery began (Klamath Task Force 1991). During the 1970s, approximately 500 fish returned each year to the hatchery but these attempts were eventually unsuccessful as the hatchery was unable to maintain the run without a source of cold summer water (Hiser 1985, Moyle et al. 2008).

The Shasta River run, probably the largest in the middle Klamath drainage, disappeared in the early 1930s as a result of habitat degradation and blockage of access to upstream spawning areas caused by Dwinnell Dam (Moyle et al. 2008). The Scott River spring run was extirpated in the early 1970s after a variety of human causes led to depleted flows and altered habitat (Moyle 2002). Along the middle Klamath River, UKTR Spring Chinook are extirpated from their historic habitat except in the Salmon River (NRC 2004). Less than ten spring-run Chinook return annually to Elk, Indian, and Clear Creeks (Campbell and Moyle 1991).

Moyle et al. state that "UKTR spring Chinook have been largely extirpated from their historic range because their life history makes them extremely vulnerable to the combined effects of dams, mining, habitat



degradation, and fisheries, as well as multiplicity of smaller factors” (2008). By the 1980s, UKTR Spring Chinook were largely eliminated from their habitat due to the loss or lack of access to the cold, clear water and deep pools they required for survival (NRC 2004). Spring-run Chinook in particular must contend with low flows and high temperatures during up and down-river migrations that can prevent them from reaching their destinations or significantly increase mortality during migration (Moyle et al. 1995, Trihey and Associates 1996).

In the Trinity River, UKTR Spring Chinook runs above Lewiston Dam included more than 5,000 adults in the Upper Trinity River and 1,000-5,000 fish each in the Stuart Fork Trinity River, East Fork Trinity River and Coffee Creek (CDFG 1990). These runs are now extinct. Over about the last thirty years, an average of 263 fish have been counted annually in the South Fork Trinity River, with runs as low as 59 (1988, 2005) and as high as 1,097 (1996). Between 1980 and 1989, an average of 142 spring-run Chinook were counted annually in the South Fork Trinity River; 351 fish between 1990 and 1999; and most recently 232 between 2000 and 2005. Historically, 7,000-11,000 UKTR Spring Chinook entered this stream (LaFaunce 1967) and outnumbered fall-run Chinook in the watershed. Between 1980 and 2004, an average of 18,903 UKTR Spring Chinook returned above Junction City on the main stem Trinity River. In 2004, 16,147 UKTR Spring Chinook were estimated to migrate into this area with 6,019 (37%) of fish entering Trinity River Hatchery classified as spring-run Chinook (Moyle et al. 2008). Trinity River Hatchery releases over one million juvenile spring-run Chinook every year and apparently all spawners in the main stem Trinity River are of hatchery origin (NRC 2004).

Hatcheries have severe negative effects on wild populations and are considered a high threat to both spring- and fall-run Upper Klamath Chinook (NMFS 2009, J. Katz pers. comm. 2010). Interactions between wild and hatchery fish influence abundance, spatial distribution, life history diversity and productivity. For more details on the threat of hatcheries in the Basin, see “hatcheries” in the discussion of threats in this petition. The Trinity River population of UKTR Spring Chinook is highly affected by hatchery fish and cannot be considered a viable wild population. Moyle et al. explain,

Essentially, the only viable wild population today is in the Salmon River. Other populations are either small and intermittent or heavily influenced by hatchery fish, so may not be self-sustaining and are likely to be extirpated in the near future (Moyle et al. 2008). Spring run Chinook populations in the Salmon River, exhibit high variability among years. The 2005 adult count estimate was 90 fish, the lowest on record, but in 2007 the number reached 841 (Moyle et al. 2008) and in 2009, it was 643 (CDFG personal communication). In Wooley Creek, escapement has ranged between 0 and 81 during 1968-1989, but more recent surveys suggest spring run Chinook are nearly extinct in this watershed. In 2005, only 18 spring run Chinook were observed (Moyle et al. 2008).

The National Research Council (2004) also noted the low abundance and limited distribution of spring-run Chinook in the Klamath Basin, especially those of wild spawning origin:

In the Klamath River drainage above the Trinity, only the population in the Salmon River and Wooley Creek remains; it has annual runs of 150– 1,500 fish (Campbell and Moyle 1991, Barnhart 1994). Numbers of fish in the area continue to decline (Moyle 2002). Because the Trinity River run of several thousand fish per year is apparently sustained largely by the Trinity River Hatchery, the Salmon River population may be the last wild (naturally spawning) population in the basin.

Moyle et al. point out the current reliance of the spring run on this dwindling Salmon River population as they make conclusions about the status of the species:

Overall, while UKTR Spring Chinook salmon are still scattered throughout the lower Klamath and Trinity basins, the only viable wild population appears to be that in the Salmon River. Trinity River fish numbers are presumably largely influenced by fish from the Trinity River hatchery. Even if Trinity River tributary spawners are considered to be wild fish, the total number of UKTR Spring Chinook in the combined rivers rarely exceeds 1000 fish and may drop to <300 in many years (2008).

In the 2008 status review, Moyle et al. report that the UKTR Spring Chinook are “vulnerable to extinction in the next 50-100 years” based on the “fluctuating nature and small size of the Salmon River population and its localized distribution in a single watershed.”

This report produced the following table:

Table 1.

<b>Metrics for determining the status of Upper Klamath/Trinity River spring Chinook salmon, where 1 is poor value and 5 is excellent.</b>		
Metric	Score	Justification
Area occupied	2	Multiple populations exist including hatchery populations but only Salmon River is viable
Effective population. size	2	Although there is a hatchery stock, there are few natural spawners support the population.
Dependence on intervention	3	Hatchery program in Trinity is probably maintaining the Trinity run. The Salmon River wild population is vulnerable to extinction from both local and out-of-basin events. More human intervention necessary to preserve Klamath stock by re-establishing populations.
Tolerance	2	Temperature and other factors in summer holding areas may exceed physiological tolerances.
Genetic risk	2	Hybridization may be occurring in some watersheds with fall run fish; populations are low enough so genetic problems can develop.
Climate change	1	The Salmon River has temperatures in summer (21-23°C) that approach lethal temperatures. A 1-2°C increase in temperature could greatly reduce the amount of suitable habitat.
Average	2.0	12/6
Certainty	3	Monitoring efforts by USDA Forest Service, CDFG, tribes and local organizations give us reasonable information about status.

Spring-run Chinook are listed as a Species of Special Concern by California Department of Fish and Wildlife and are thus qualified to be added to the state and federal lists of threatened or endangered fish (Moyle et al. 2008). They are also considered a Sensitive Species by the Pacific Southwest Region of the US Forest Service.

Should NMFS choose not to consider the spring run of Upper Klamath Trinity River Chinook as a separate ESU or DPS, the threatened status of the spring run within the current ESU is enough rationale for listing the entire current ESU under the Endangered Species Act. Protecting the spring run from extinction is essential to maintaining the diversity of the existing ESU regardless of whether the ESU is redefined or a spring-run Chinook DPS is acknowledged. By NMFS precedent, an entire ESU may be listed under the ESA based on the threat to one of the life histories that composes it. According to Bilby et al. (2005), the

loss of many of the spring-run Chinook salmon populations from the Lower Columbia River ESU was one of the factors supporting the NMFS decision to list the ESU as threatened (NOAA 2003). The same is true of the Puget Sound Chinook ESU.

In describing foreseeable long-term trends for UKTR Spring Chinook, Moyle et al. conclude:

UKTR spring Chinook have declined from being the most abundant run in the basin, to being a tiny run in danger of extinction. There are multiple possible futures for this distinctive salmon. The two extremes are extinction and restoration to a large segment of its historic range. At the present time it is headed for extinction. Climate changes will lead to increased water temperatures and fluctuations in many portions of the basin. Without drastic management measures, climate change will likely be the final blow to wild spring Chinook in the Klamath Basin. The run will then simply be a remnant hatchery run in the Trinity River for a few decades before it finally becomes so introgressed with the fall run so that it loses its genetic and life history distinctiveness. Alternately, there is potential for UKTR spring Chinook salmon to be restored to large portions of the Klamath basin through a few decades of restoration of habitat and habitat access (e.g., Shasta River, upper Klamath Basin) (2008).

UKTR Spring Chinook require immediate protections under the Endangered Species Act if they are to persist in the Klamath Basin.

#### *Fall run Chinook*

Compared to current numbers of Chinook salmon in the Upper Klamath and Trinity Rivers, runs were much larger historically (NRC 2004) and low abundance predictions of Klamath River fall Chinook in recent years have forced severe harvest restrictions to West Coast fisheries (NMFS 2009). The vast majority of the fish today are fall-run fish of both wild and hatchery origin" (NRC 2004) and most records of Chinook salmon abundance in the Basin were taken after the initial decline of spring-run Chinook and therefore historical estimates tend to refer primarily to the fall run (Moyle et al. 2008). NMFS (2009) refers to sizable historic estimates in the Basin: "Based on records of commercial harvest, fall run Chinook are likely to have numbered 400,000 to 500,000 in the early 1900s. Runs in the last several decades have ranged from below 50,000 to 225,000 fish. These runs are substantially lower than historic levels." Snyder (1931) provided an early estimate of 141,000 fish, based on the 1912 fishery catch of 1,384,000 pounds of packed salmon. Moffett and Smith (1950) then estimated the Klamath River Chinook runs to be about 200,000 fish annually, from commercial fishery data from between 1915 and 1943. USFWS (1979) combined these statistics to approximate an annual catch and escapement of about 300,000 to 400,000 fish for the Klamath River system from 1915-1928 (Moyle et al. 2008).

The National Research Council (2004) reviewed historical estimates of fall Chinook:

...the river harvest alone in 1916–1927 was 35,000–70,000 fish (as estimated from Snyder's data showing an average weight of 14 lb/fish and a harvest of 500,000– 1,000,000 lb each year). If, as Snyder's data suggest, the river harvest was roughly 25% of the ocean harvest in this period, annual total catches were probably 120,000–250,000 fish. This in turn suggests that the number of potential spawners in the river was considerably higher than the number spawning in the river today. Since 1978, annual escapement has varied from 30,000 to 230,000 adults. In both 2000 and 2001, runs were over 200,000 fish. If it is assumed that fish returning to the hatcheries are, on the average, 30% of the population and that 30% of the natural spawners are also hatchery fish, then roughly half the run consists of salmon of natural origin (including progeny of hatchery fish that spawned in the wild).

At the Klamathon Racks, a fish counting station close to the location of Iron Gate Dam, an estimated annual average of 12,086 Chinook were counted between 1925-1949, and the number declined to an average of 3,000 between 1956-1969 (USFWS 1979). In 1965, the Klamath River Basin was reported to contribute 66% (168,000) of Chinook salmon spawning in California's coastal basins (CDFG 1965). This production was distributed between the Klamath (88,000 fish) and Trinity (80,000 fish) basins, with approximately 30% of the Klamath Basin fish originating in the Shasta (20,000 fish), Scott (8,000 fish), and Salmon (10,000 fish) Rivers (Moyle et al. 2008). Snyder (1931) recorded the Shasta River as the best spawning tributary in the basin. It has since seen a marked decline in the number of fish returning. Leidy and Leidy (1984) estimated an annual average abundance of 43,752 Chinook from 1930-1937; 18,266 between 1938 and 1946; 10,000 between 1950 and 1969; and 9,328 from 1970-1976. A review of recent escapement into the Shasta River found an annual escapement of 6,032 fish from 1978-1995, and an escapement of 4,889 fish between 1995 and 2006 (CDFG 2006). In the Scott River, fall Chinook escapement averaged 5,349 fish between 1978 and 1996 and 6,380 fish between 1996 and 2006 (Moyle et al. 2008).

The National Research Council (2004) notes the drop in the population in the Shasta River as an important contributor to the overall decline of Upper Klamath Chinook:

Additional evidence of decline is the exclusion of salmon from the river and its tributaries above Iron Gate Dam in Oregon, where fairly large numbers spawned, and the documented decline of the runs in the Shasta River. The Shasta River once was one of the most productive salmon streams in California because of its combination of continuous flows of cold water from springs, low gradients, and naturally productive waters. The run was probably already in decline by the 1930s, when as many as 80,000 spawners were observed. By 1948, the all-time low of 37 fish was reached. Since then, run sizes have been variable but have mostly been well below 10,000. Wales (1951) noted that the decline had multiple causes, most related to fisheries and land use in the basin, but laid much of the blame on Klamath River lampreys: the lampreys preyed extensively on the salmon in the main stem when low flows delayed their entry into the Shasta River.

In the Trinity River, Coots (1967) estimated an annual run of about 80,000 fish. Hallock et al. (1970) reported about 40,000 Chinook salmon entered the Trinity River above the South Fork. Burton et al. (1977 in USFWS 1979) estimated that 30,500 Chinook below Lewiston Dam on the Trinity River escaped between 1968 and 1972. The average fall Chinook run in the Trinity River between 1978 and 1995 was 34,512. This average declined between 1996 and 2006 to 23,463 fish (CDFG 2007).

The total in river escapement into this ESU ranged from 34,425 to 245,542 fish with an average 5-year geometric mean of 112,317 fish between 1978 and 2006 (Moyle et al. 2008). A large proportion of these fish are of hatchery origin and therefore do not contribute, and even constitute a threat, to the long-term persistence of Chinook salmon in the Basin and (Bilby et al. 2005).

Hatcheries have played a major role in fall-run Chinook salmon abundance since the 1960s (Moyle et al. 2008). Approximately 67% of hatchery releases have been fall-run Chinook from Iron Gate and Lewiston hatcheries (Myers et al 1998). Between seven and twelve million juveniles have been released annually (NRC 2004). Between 1997 and 2000, an average of 61% of the juveniles captured at the Big Bar outmigrant trap were hatchery origin fish (USFWS 2001) and at the Willow Creek trap on the Trinity River, between 1997 and 2000, 53% and 67% of the Chinook captured in the spring and fall were hatchery-origin fish, respectively (USFWS 2001). Some naturally-spawning fish are actually hatchery strays. Based on coded wire tag expansion multipliers, as much as 40% (Shasta River) of annual escapement consists of hatchery strays (R. Quinones, unpublished data as cited by J. Katz, pers. comm. 2010). As this region becomes dominated by hatchery fish, wild fish are threatened by greater competition, predation, disease transmission, and reduced fitness due to interbreeding with hatchery fish. As a region becomes dependent

on hatchery fish, its ability to recover as a wild-spawning population of fish is highly compromised (ISAB 2005)

Upper Klamath-Trinity River fall-run Chinook are a US Forest Service Sensitive Species. They are managed by CDFW for sport, tribal, and ocean fisheries.

According to the Moyle et al. (2008) status review, fall-run Chinook have declined from historical numbers of between 125,000 and 250,000 fish returning annually to the Basin to an average run size of about 120,000 since 1978 (from tables compiled by CDFG). Numbers in the past 25 years have sometimes reached this historical range but lower numbers are now typical and current runs depend heavily on hatchery production. Fall-run Chinook have experienced a major downward trend in recent years, especially as a result of the 2002 fish kill in the lower river. Climate change will lead to even more threatening conditions for this ESU (Barr et al. 2010).

The Moyle et al. status review summarizes the long term trends for Klamath Basin Fall-run Chinook and reports:

There is little reason to be optimistic about long-term trends in the future without major changes in watershed management. High summer water temperatures are a major driver of UKTR Chinook survival and they are likely to increase under most climate change scenarios. Likewise, changes in ocean conditions may cause decreased survival of fish once they leave the river (Moyle et al. 2008).

The report also points out that the increased reliance of the fall run on hatchery production is “likely masking a decline of wild production in the Klamath-Trinity basins”. Moyle et al. cited a 2005 report stating, “models evaluating limiting factors and habitat availability for UKTR Chinook salmon suggest that crucial steps need to be taken soon to increase UKTR fall Chinook spawners” (citing Bartholow and Henrikson 2005).

The National Research Council acknowledges that while fall-run Chinook have declined significantly, they may be good candidates for recovery under the right management reporting, “the fishery of the Klamath is particularly important...because of the possibility of maintaining it (NRC 2004). NRC goes on to note that both adults migrating upstream and juveniles moving downstream face water temperatures that are bioenergetically unsuitable or even lethal and that the vulnerability of the run to stressful conditions was dramatically demonstrated by the mortality of thousands of adult Chinook in the lower river in late September 2002.

Both spring- and fall-run Chinook have declined in the Klamath Basin with spring-run Chinook demonstrating the most drastic trends of reduction. The spring run requires protections under the ESA in order to avoid extinction. Maintaining the spring run is essential to supporting the diversity of the current ESU and the vulnerability of this run in particular could justify listing the entire Upper Klamath-Trinity Rivers ESU according to the ESA.

## **2. RANGE AND DISTRIBUTION**

Spring- and fall-run Chinook distributions have been affected differently by conditions in the Basin because spring-run Chinook enter freshwater earlier than fall-run Chinook, and historically traveled much greater distances upstream (Hamilton et al. 2005).

Spring-run Chinook salmon were historically found throughout the Klamath Basin. They used suitable



reaches in the larger tributaries such as the Salmon River and, flows permitting, they also accessed smaller tributaries for holding and spawning. They were once especially abundant in the major tributary basins of the Klamath and Trinity Rivers, such as the Salmon, Scott, Shasta, South Fork and North Fork Trinity Rivers (Moyle et al. 2008). Spring run Chinook were once also widely distributed throughout the Basin above the current sites of dams, attaining holding and spawning grounds on the Sprague, Williamson and Wood Rivers above Upper Klamath Lake (Moyle et al. 2008). This habitat was blocked below Klamath Falls in 1912 by construction of Copco 1 Dam (Hamilton et al. 2005). The construction of Dwinnell Dam in 1925 on the Shasta River eliminated access to UKTR Spring Chinook habitat in that watershed.

Currently, only the Salmon River, a major freshwater tributary to the Klamath River, maintains a viable population in the Klamath River Basin (Moyle et al. 2008). Approximately 177 km (110 mi) of habitat is accessible to spring-run Chinook in the Salmon River (West 1991) but most of it is underutilized or unsuitable (Moyle et al. 2008). The South Fork Salmon River holds the majority of the spawning population but smaller tributaries where spring Chinook redds have been found in the Salmon River Basin include Wooley, Nordheimer, Knownothing, and Methodist Creeks. In addition, there are dwindling populations of spring Chinook in Elk, Indian, Clear Creeks (Moyle et al. 2008).

In the Trinity River Basin, spring Chinook salmon once spawned in the East Fork, Stuart Fork, Coffee Creek, and the main stem Upper Trinity River (Campbell and Moyle 1991). The construction of Lewiston Dam in 1964 blocked access to 56 km of spawning and nursery habitat on the main stem Trinity River (Moffett and Smith 1950).

Currently, Trinity River spring Chinook are present in small numbers in Hayfork and Canyon Creek, as well as in the North Fork Trinity, South Fork Trinity and New Rivers (Moyle et al. 2008). The Trinity River Hatchery releases over 1 million juvenile spring run Chinook every year, usually in the first week of June. Apparently, all spawners in the main-stem Trinity River below Lewiston Dam are of hatchery origin (NRC 2004).

The distribution of fall-run Upper Klamath Chinook has been less affected by dam construction because of their lower reliance on upstream spawning habitat. They are found in all major tributaries above the confluence of the Klamath and Trinity rivers and in the river main stems (Moyle et al. 2008). Fall-run Chinook return to both Iron Gate and Trinity River Hatcheries.

Upper Klamath fall Chinook salmon once ascended to spawn in habitat, now-blocked, in middle Klamath tributaries (Jenny Creek, Shovel Creek, and Fall Creek), and in rivers in the Upper Klamath Basin, especially in wetter years (Hamilton et al. 2005). On the lower Klamath River, tributaries providing suitable spawning habitat include Bogus, Beaver, Grider, Thompson, Indian, Elk, Clear, Dillon, Wooley, Camp, Red Cap, and Bluff Creeks (Moyle et al. 2008). The Salmon, Shasta and Scott Rivers were historically and remain among the most important spawning areas for fall-run Chinook, when sufficient flows are present. Spawning consistently occurs in the main stem Klamath River between Iron Gate Dam and Indian Creek, with the two areas of greatest spawning density typically occurring between Bogus Creek and the Shasta River and between China Creek and Indian Creek (Magneson 2006).

On the Trinity River, UKTR Spring Chinook once ascended above the site of Lewiston Dam to spawn as far upstream as Ramshorn Creek and historically, the majority of Trinity River fall Chinook spawning was located between the North Fork Trinity River and Ramshorn Creek. Currently, spawning is confined to the approximately 100 km between Lewiston Dam and Cedar Flat (Moyle et al. 2008). Important historic spawning tributaries above Lewiston Dam include the Stuart Fork, Browns and Rush Creeks (Moffett and Smith 1950). The distribution of redds in the Trinity River is highly variable (Moyle et al. 2008). The reaches closest to the Trinity Hatchery contain significant spawning but there is great variability in use of spawning habitat in reaches between the North Fork Trinity River and Cedar Flats (Quilhiullalt 1999). Additional

tributaries contain spawning fall-run Chinook salmon in the Trinity River including the North Fork, New River, Canyon Creek, and Mill Creek (Moyle et al. 2008). In the South Fork, fall-run Chinook once spawned in the lower 30 miles up to Hyampom, and in the lower 2.7 miles of Hayfork Creek (LaFauce 1967).

The distributions of both the fall and spring runs of UKTR Chinook have contracted since the end of the 19<sup>th</sup> century. Because of the unique life history of the spring run, it has been most damaged by these changes, directly causing extirpation of several populations and making the run vulnerable to future genetic introgression with the other life history type in the Basin.

### **3. ABUNDANCE**

Please see #1, Population Trend.

### **4. LIFE HISTORY (SPECIES DESCRIPTION, BIOLOGY, AND ECOLOGY)**

#### **A. Life Cycle and Physiology**

The Chinook salmon life cycle begins when an adult female prepares a nest, called a “redd,” by digging in a stream area with suitable gravel type, water depth and water speed (McCullough 1999). Body size, which is related to age, may be an important factor in migration and redd construction success. All Chinook salmon tend to use spawning sites with large gravel and significant water flow through the gravel. Deep water with sufficient sub-gravel flow is essential to provide oxygen to the eggs and remove metabolic waste. Thus, limited sub-gravel flow resulting in low oxygen concentrations are linked to egg mortality (Allen and Hassler 1986). Excess silt in the water can also block water flow through gravel (Healey 1991).

Female Chinook lay 2,000 to 17,000 eggs, each about nine millimeters in diameter (Healey 1991). One or more males then release sperm into the redd before females cover it with gravel (Allen and Hassler 1986). Once the eggs have been fertilized, adult Chinook guard the nest briefly (up to a month) before dying. Egg mortality can result from limited oxygenation, extreme temperatures, predation and toxic chemicals (Healey 1991). Depending on water temperature, the eggs will hatch three to five months after being laid, which ensures young salmon (termed “alevins”) emerge when river conditions are best.

Alevins remain in the spawning habitat for at least two to four weeks until their yolk sacs are completely used. Like the eggs, Alevins require adequate water flow through the gravel for growth and survival (Nawa and Frissell 1993). Once the alevin consumes its yolk sac, it enters the fry-fingerling stage and begins feeding and socializing. Some fry remain in the spawning grounds, while others begin their tail-first migration to the ocean soon after emerging from the redd. A number of factors such as water flow, food availability, temperature and competition may influence when the fry and fingerlings migrate.

The vast majority of juvenile fall Chinook migrate within one year of hatching whereas the majority of spring Chinook migrate after one year. Moyle et al. (2008) reports on a study by Sullivan (1989) which identified three distinct types of juvenile freshwater life history strategies for UKTR fall Chinook. The majority of fish fall into the first and second categories: 1) rapid migration following emergence, and 2) tributary or cool-water area rearing through the summer and fall migration. A small percentage of fish were in a third category, which remained in freshwater through winter and migrated to the estuary as yearlings.

Juvenile Chinook undergo smoltification, a physiological transformation that prepares the fish for the increased salinity in the ocean (Weitkamp 2001). Fall Chinook grow to smolt size near the end of their time in the estuary, whereas spring Chinook turn into large smolts before they reach the estuary (Healey 1991). The amount of time a juvenile salmon spends in freshwater varies. Some male Chinook salmon mature in freshwater while others spend less than a year in freshwater, depending on genetic and environmental

factors (NRC 2004). Juvenile fall-run Chinook spend less than a year in the fresh water of the Klamath River Basin, allowing the juveniles to avoid unfavorable late summer stream conditions (Healey 1991, Moyle 2002). Spring-run Chinook however, spend at least one year in freshwater before migrating to the ocean (Healey 1991).

The majority of spawners returning to the Klamath River Basin are age three fish. This reflects heavy mortality of older and larger fish in ocean fisheries. Some four, five, and six year old fish are found spawning (Moyle et al. 2008). Some fish return from the ocean within two or three months, in the case of a small number of yearling males (called jack salmon). These jack salmon constituted 2-51 percent of the annual Klamath River Chinook salmon numbers between 1978 and 2006 (Game 2006 as cited in Moyle et al. 2008)

In the ocean, Klamath River Chinook salmon are found in the California Current system off the California and Oregon coasts. Moyle et al. (2008) reports that salmon follow predictable ocean migration routes. Chinook recaptured from the Klamath River generally use ocean areas that exhibit temperatures between 8° and 12°C (Hinke et al. 2005). Chinook salmon from the Klamath and Trinity hatcheries were observed in August south of Cape Blanco (Brodeur et al. 2004).

Adult Chinook return to freshwater to spawn and die. During ocean residence, salmon build up stores of body fat and cease feeding during upstream migration. Spring-run Chinook, enter the Klamath River between March and July and spawn between late August and September, while fall-run Chinook enter the river between July and October and spawn between September and January (Myers et al. 1998).

The timing of upriver migration into freshwater and spawning of Chinook salmon is likely defined by water temperature and flow regimes. For example, data collected primarily from Columbia River migration suggests that spring Chinook migrate at 3.3-13.3°C and fall Chinook migrate at 10.6-19.4°C (McCullough 1999).

In general, salmon runs today occur later than they did historically. The current fall run of Chinook occurred earlier and was known as the summer run in the past (Snyder 1931). For example, Moyle et al. (2008) reports that run timing on the Shasta and Klamathon Racks appears to occur one to four weeks later than historic run timing. Although run timing has responded to accommodate warmer stream conditions, temperatures are likely still stressful to migrating salmon and may result in increased mortality of spawning adults (NRC 2004).

Chinook rely primarily on olfaction memory and partially on sight to find their way back to their natal stream. Some evidence suggests that fall Chinook seem to have a stronger homing instinct than spring Chinook (Healey 1991). Adults primarily migrate during the day, which exposes them to higher temperatures that may inhibit their migration or increase mortality. After spawning, adult females defend their eggs; thereafter both male and female salmon deteriorate rapidly, often developing a fungal disease, and die within 2-4 weeks (Allen and Hassler 1986).

### *Spring Chinook*

The variation of life history between spring and fall Chinook is relevant to the difference in status between the runs. Many of these are shown below, in Table 1. Unlike fall Chinook, spring Chinook in the Klamath River Basin utilize streams and tributaries a great deal during their life cycle. Juveniles usually reside in streams for at least one year before migrating to the ocean (Healey 1991). These juveniles are much more dependent on freshwater stream ecosystems because of their extended residence in these areas.

Spring Chinook adults return to the Klamath River between March and July before their gonads have fully developed (Moyle et al. 2008). The majority of late entry spring Chinook in the Klamath system are of

hatchery origin (Barnhardt 1994, NRC 2004). Moyle et al. (2008) note a study which identified adult Trinity River spring Chinook migration continuing until October. They argue however that given this late timing, it is unclear if these fish are sexually mature and able to spawn with spring Chinook adults already in the system. Also, they report, that because this late spring run is limited to the Trinity River, it is possible these fish represent hybrid spring and fall Chinook created by hatchery practices (Moyle et al. 2008).

Spring adults typically hold in deep (greater than two meters) freshwater pools for 2-4 months to allow their gonads to develop before spawning (NRC 2004). These behaviors allow spring Chinook salmon to spawn much further upstream than fall Chinook, who must contend with higher temperatures and lower flows in the lower Klamath during the late summer months (Moyle 2002). Spring Chinook spawning peaks in October.

After emerging from the redds between March and early June, spring Chinook fry remain in the same cold headwaters as holding adults for the summer (West 1991). Some juveniles migrate downstream beginning in October, but most remain in the headwaters until the spring (Trihey and Associates 1996).

Spring Chinook typically spend more time in freshwater streams, both during their downriver and spawning migrations. They are therefore more vulnerable to adverse stream conditions. The increased time spent in streams and greater distance of migration are disadvantages to survival in the current system because spring Chinook experience low flows and high temperatures during migration that can prevent them from reaching their destinations and significantly increase mortality during migration (Moyle et al. 1995, Trihey and Associates 1996).

Table 2.

<b>Summary of Life Cycle and Physiological Differences between Spring and Fall Chinook in the Upper Klamath River Basin</b>			
	Spring Chinook	Fall Chinook	Citations
Adult migration immigration	Between March and July with a peak between May and early June. Spring Chinook migrate before reaching sexual maturity and holdover in deep (greater than two meters) freshwater pools for 2-4 months prior to spawning.	Between mid July and late October. Migration and spawning occur under decreasing temperature regimes.	Barnhart 1994, NRC 2004, Myers et al. 1998, Moyle et al. 2008
Holding elevation	Historically, overlap of spawning areas was rare between spring and fall Chinook because spring Chinook spawned well upstream of fall Chinook before the construction of dams. Spatial separation between the two runs in the Klamath-Trinity system occurs at approximately 1,700 feet	Downstream of 1,700 feet elevation (must contend with higher temperatures and lower flows during migration in the late summer months.	Moyle 2002, Moyle et al. 2008
Spawning	Begins between late August and September, peaks in October.	Between September and January.	Myers et al. 1998, Moyle et al. 2008
Emergence from gravel	Between March and early June, remain in the same cold headwaters as holding	Late winter or spring, timing dictated by water temperature.	Trihey and Associates 1996, Moyle et al. 2008

	adults for the summer.		
Juvenile out-migration	Some juveniles migrate downstream beginning in October, but most remain in the headwaters until the spring.	Most juveniles reside >one year in fresh water, allowing them to avoid unfavorable late summer stream conditions. Between 1997-2000, wild juveniles were observed in the lower river in the beginning of June with a peak in mid-July.	West 1991, Moyle et al. 2008

## B. Diet

Chinook salmon diet varies depending on growth stage. As alevins, the young fish rely on nutrients provided by the yolk sack attached to the body until leaving the redd after a few weeks. After emerging from the gravel, young fry begin to feed independently. Juveniles feed in streambeds before gaining strength to make the journey to the ocean. During this time, fry feed on terrestrial and aquatic insects and amphipods.

As juveniles migrate toward the ocean, they may spend months in estuarine environments feeding on plankton, small fish, insects, or mollusks. Small fry feed primarily on zooplankton and invertebrates, while larger smolts feed on insects and other small fish (ie: chironomid larvae, chum salmon fry and juvenile herring; Healey 1991).

Juvenile Chinook salmon can feed and grow at continuous temperatures up to 24°C when food is abundant and conditions are not stressful (Myrick and Cech 2001). In the late summer, juveniles seek out cooler temperatures in refuge pools along the Lower Klamath River, where they may experience intraspecies competition for food.

At sea, where the bulk of feeding and growth is done, adult Chinook typically feed on small marine fish, crustaceans, and mollusks (i.e., squid). Adult Chinook grow quickly in the estuary and gain body mass during their time at sea, building fat reserves that are required for upstream migration and spawning. During the upstream migration, Chinook do not feed and rely on stored energy while traveling hundreds of miles.

## 5. KIND OF HABITAT NECESSARY FOR SURVIVAL

The variety of habitats Chinook salmon encounter means that they require a number of particular conditions in order to survive and reproduce. Chinook salmon in the Klamath-Trinity River Basin occupy the main stem rivers and tributaries during migration, spawning, and rearing. They also occupy the estuary and open ocean for variable time periods during maturation. Chinook salmon habitat use and requirements are best studied for their time spent in freshwater although ocean conditions are also significant to the survival and viability of these populations.

### *Migration and Spawning habitat*



Upper Klamath Chinook salmon migrate from the open ocean to spawning habitat, typically to the same place where they hatched. During this time, they are in a stressed condition due to their reliance on stored energy to complete the long journey upstream, leaving them highly susceptible to additional environmental stressors. This was clearly a factor during the 2002 fish kill when inadequate stream flows, temperature conditions, and the resultant crowding of fish led to disease outbreaks and mass mortality. Chinook salmon require access to spawning habitat in the main stem rivers and tributaries, cold water, cool pools in which to hold, clean spawning gravel, and particular dissolved oxygen levels, water velocities, and turbidity levels in order to successfully migrate and spawn. Access to spawning habitat is threatened by physical conditions including the existence of impassable dams, which caused the extirpation of several populations of spring run Chinook. Also, the ongoing variability in water flows does not allow Chinook salmon to access certain streams for spawning.

During migration and spawning, low water temperatures are crucial to success of Chinook salmon. Under warm conditions, salmon cease their upstream migration and instead hold in cooler pools. Upper Klamath spring Chinook enter the Klamath estuary during a period when river water temperatures are at or above optimal holding temperatures (Moyle et al. 2008). In June, temperatures in the Lower Klamath River typically rise above 20°C and can be as high as 25°C in August (Moyle et al. 2008). Prior to entering fresh water, Spring Chinook use thermal refuges in the estuarine salt wedge and associated near shore ocean habitat (Strange 2003). Strange (2005) found that when daily water temperatures were on the rise, Chinook migrated upstream until temperatures reached 22°C; when temperatures were decreasing, fish continued to migrate upstream at water temperatures of up to 23.5°C. Optimal adult holding habitat for spring Chinook is characterized by pools or runs greater than one meter deep with cool summer temperatures (<20°C), all day riparian shade, little human disturbance, and underwater cover such as bedrock ledges, boulders, or large woody debris (West 1991). Because the Salmon River and its forks regularly warm to summer daytime peaks of 21-22°C, presumably the best holding habitats are deep pools with cold water sources, such as those at the mouths of tributaries, or are deep enough to be subject to thermal stratification (Moyle et al. 2008). Due to the typically higher flows during spring Chinook migration, Salmon River spring Chinook are typically able to move high into the system, allowing them to reach areas with more optimal river temperatures, however this is not as feasible during drought years. UKTR fall Klamath fall Chinook salmon enter the Klamath estuary for only a short period prior to spawning. However, unfavorable temperatures can be found in the Klamath estuary and lower river during this period and chronic exposure of migrating adults to temperatures of even 17°-20°C is detrimental (Moyle et al. 2008). Optimal spawning temperatures for Chinook salmon are less than 13°C (McCullough 1991) and fall temperatures are usually within this range in the Trinity River (Quilhillalt 1999). Magnuson (2006) reported water temperatures up to 14.5°C during spawner surveys in 2005. The Shasta River historically was the system's most reliable spawning tributary from a temperature perspective (Snyder 1931), but diversions of cold water have greatly diminished its capacity to support salmon (Moyle et al. 2008).

According to McCullough (1999), adults are more sensitive to higher temperatures than juveniles, as higher temperatures can increase the adults' metabolic rate and deplete their energy reserves, weaken their immune system, increase exposure to diseases, and prevent migration. Also, temperatures at or above 15.6°C can increase the onset of diseases (Allen and Hassler 1986). Riparian vegetation is critical as it provides much needed shade to cool the water (Moyle 2002) and creating "thermal refugia" in which fish can escape high temperatures. The presence of cold water in the Basin is threatened by dams, water withdrawals, as well as logging and grazing which decrease riparian vegetation.

Spring Chinook migrate earlier before their gonads are fully developed and then hold in deep cool pools before spawning. Therefore, the presence of deep cold-water pools is essential to the survival of spring-run fish in particular. Dams, water withdrawals, logging, mining, and grazing all contribute to lower water levels

in the Basin and threaten the presence of deep pools essential for spring Chinook. Spring Chinook are also more sensitive to high temperatures than fall Chinook (Allen and Hassler 1986).

According to the National Research Council (2004), Migrating adults also need dissolved oxygen levels above five mg/l, deep water (deeper than 24 cm), breaks from high water velocity, and water turbidity below 4,000 ppm (NRC 2004).

Spawning gravel also must be free of excessive sediment such that water flow can bring dissolved oxygen to the eggs and newly hatched fish. With too much sediment, incubating eggs are smothered and reproductive success rate declines significantly. In a study on the Shasta River (Ricker 1997), six out of seven locations, had levels of fine sediment high enough to significantly reduce fry emergence rates and embryo survival. Logging, mining, and grazing increase sediment in Chinook spawning habitat in the Basin. Spawning occurs primarily in habitats with large cobbles loosely imbedded in gravel and with sufficient flows for subsurface infiltration to provide oxygen for developing embryos (Moyle et al. 2008). In a survey of Trinity River Chinook redds, Evenson (2001) found embryo burial depths averaged 22.5-30cm suggesting minimum depths of spawning gravels needed. Regardless of depth, the key to successful spawning is having adequate flows of water (Moyle et al. 2008).

### *Rearing*

During rearing and migration, Chinook require certain temperatures, habitat diversity, and water quality characteristics.

After hatching, juvenile Chinook require rearing habitat before making their migration to the estuary and to the ocean. Ideal fry rearing temperature is estimated at 13°C and temperatures above 17°C are linked with increased stress, predation, and disease. High water temperatures can prevent smoltification, an essential process that prepares fish to leave freshwater habitat (McCullough 1999).

Stream temperature during migration is critical, as prolonged exposure to temperatures of 22-24°C has resulted in high mortality for migrating smolts, and juveniles who transform into smolts above 18°C may have low survival odds at sea (Baker et al. 1995, Myrick and Cech 2001). Vegetation provides relief from high temperatures, as well as shelter from predators (Moyle 2002). Logging, mining, and grazing all have reduced streamside vegetation in the Basin.

Habitat diversity is important for juvenile Chinook survival, as juveniles face predation by fish and invertebrates, as well as competition for rearing habitat from other salmonids (hatchery Chinook and Steelhead; Healey 1991, Kelsey et al. 2002). Chinook require the correct grades of gravel, the right depths and prevalence of deep pools as well as the existence of large woody debris and the right incidence of riffles (Montgomery et al. 1999). This allows for a variety of habitats which are required by Chinook at different life stages.

Chinook fry may compete for shallow water rearing habitat with hatchery fish and steelhead. Increased river flows mitigate this competition and help Chinook survival by increasing habitat on the river's edge, where fry (under 50 mm) feed and hide from predators (NRC 2004).

As juvenile Chinook migrate down river, they prefer boulder and rubble substrate, low turbidity and water velocity slower than 30 cms<sup>-1</sup> (Healey 1991). These conditions allow juveniles to use the faster-moving water in the center of the river for drift feeding, while resting in the slower areas (Trihey and Associates 1996). Smaller fish tend to stay in the slower-moving water near the banks of the river. High water turbidity threatens Chinook (Bash et al 2001) and in the Klamath Basin, logging and grazing both serve to increase turbidity.

Juvenile Chinook require high levels of dissolved oxygen (DO). Low DO levels decrease alevin and fry survival; decrease successful Chinook egg incubation rates; decrease the growth rate for surviving alevins, embryos, and fry; force alevins and juveniles to move to areas with higher DO; and negatively impact the swimming ability of juvenile Chinook (NCWQCB 2010). If DO levels average lower than 3-3.3 mg/L, 50% mortality of juvenile salmonids is likely, while in water above 20°C, daily minimum DO levels of 2.6 mg/L are required to avoid 50% mortality (NCWQCB 2010). Factors in the Basin which contribute to sub-optimal DO levels include chemical pollution, logging, and dams.

Chinook salmon also require pH levels that are not too high. Even high pH levels which are not directly lethal to salmonids can cause severe harms to Upper Klamath Chinook (NCWQCB 2010), including decreased activity levels, increased stress responses, a decrease or cessation of feeding, and a loss of equilibrium (NCWQCB 2010). The Klamath River's pH in the summer often rises above 8.5, and sometimes reaches 9. At the Miller Island Boat Camp in 2008, the river's pH in early July, measured daily, had several consecutive days with pH values ranging from 9.06-9.53 (USGS 2009, Appendix B). Few studies directly examine the effects of high pH values on Chinook salmon. However, rainbow trout are stressed by pH values above 9 and generally die if the pH value rises above 9.4 (NCWQCB 2010). Nutrient loading of stream systems including those caused by agricultural runoff can lead to higher pH in river systems (NCWQCB 2010).

Once juvenile Chinook reach the estuary, less developed fall-run fry remain and seek out the tidal channel where the banks are low, while larger spring run smolts prefer near shore areas near the mouth of the river (Healey 1991). Juveniles change location with the tide as the salinity of the water changes. Larger Chinook smolts seek out deeper pools to avoid light.

### *Ocean*

Once Chinook enter the ocean, most reside at depths of 40-80 meters (Healey 1991). Some research suggests that spring Chinook migrate further offshore, while fall Chinook tend to stay near the shore and close to their river (Allen and Hassler 1986). In the marine environment, Chinook salmon require nutrient-rich, cold waters associated with high productivity and higher rates of salmonid survival. Warm ocean regimes are characterized by lower ocean productivity which can affect salmon by limiting the availability of nutrients regulating the food supply and increasing the competition for food. Climate and atmospheric conditions can affect these conditions (NMFS 1998). In order to survive in the marine environment, Chinook salmon also require favorable predator distribution and abundance. This can be affected by a variety of factors including large scale weather patterns such as El Niño. NMFS (1998) cites several studies which indicate associations between salmon survival during the first few months at sea and factors such as sea surface temperature and salinity.

## **6. FACTORS AFFECTING ABILITY TO SURVIVE AND REPRODUCE**

Discuss the basis for the threats to the species or subspecies, or to each population, occurrence or portion of range (as appropriate) due to one or more of the following factors:

- (1) present or threatened modification or destruction of its habitat;

### *Dams*

Dams in the Klamath Basin have destroyed Chinook habitat and forced modifications to the UKTR Chinook's range. Most fisheries biologists rate dams as being a "high" threat to both spring and fall Klamath Chinook salmon (NMFS 2009, J. Katz, pers. comm. 2010). The sequestration of habitat behind

dams has acted as a major limiting factor to Klamath Basin Chinook populations, especially spring-run Chinook and the presence of these dams has likely inhibited recovery in years when conditions would otherwise have permitted it. In addition, dams affect the quality of habitat downstream by preventing spawning gravel from traveling downstream (Moyle et al. 2008), releasing limited, warm, and sometimes toxic water, and dictating unnatural stream morphology or structure.

Dams have been a barrier for Upper Klamath Chinook since 1912, when construction of Copco 1 Dam began (Hamilton 2016), closely followed by Copco 2 Dam in 1925. Iron Gate Dam represents the current extent of upstream migration for Chinook on the Klamath River. It was built in 1962 to produce hydroelectric power as well as to reregulate the wildly varying flows released by the Copco 1 and 2 Dams. In 1963, Lewiston Dam was built and became the current upstream limit to Chinook migration in the Trinity River.

UKTR spring Chinook have been particularly affected by dams, as they spawned largely in areas that are now unavailable (Moyle et al. 2008). Above Iron Gate Dam, there are approximately 970 km of blocked Chinook habitat (Hamilton et al. 2005). The construction of Dwinnell Dam in 1926 on the Shasta River blocked habitat that led to the disappearance of the Shasta River spring run (NRC 2004). Half of the available spawning habitat in the Trinity River Basin was blocked by Lewiston Dam (Myers et al. 1998). These restrictions to Chinook spawning range have been widely implicated in the decline of Upper Klamath Chinook populations, particularly spring run populations, throughout the Klamath Basin. Another result of limits to upstream habitat has been the introgression of the spring and fall runs, leading to a decline in genetic variability and further threatening the long-term viability of the ESU (Moyle et al. 2008).

Dams also contribute to a reduction in spawning gravel. Gravel can be caught in reservoirs behind dams and is unable to travel downstream to spawning habitat. Limited access to spawning gravel has been reported to affect spawning prevalence in both the Shasta and Klamath Rivers (Kondolf 2000).

Dams have negative effects on downstream water quality. The water which is held behind dams is both stagnant and warm and serves to dramatically increase the prevalence of Harmful Algal Blooms (HABs) in reservoirs and downstream (Humborg et al. 2000, Anderson et al. 2002). Dams also decrease levels of dissolved silicon in the water, leading to changes and imbalances in downstream phytoplankton communities and increased human water use causes raised levels of nitrogen and phosphorous in reservoirs, all contributing to the prevalence and severity of HABs (Humborg et al. 2000, Anderson et al. 2002). HABs have been noted at abnormally high levels in both the Copco and the Iron Gate Reservoirs, such that the EPA demanded that California include microcystin toxin (released by HABs) as a cause of impairment in the Klamath River (EPA 2008). In 2006, microcystin toxins were measured in those reservoirs at 600 times the World Health Organization's recommended levels (EPA 2008). Higher levels of algal productivity also leads to increased decomposition, which in turn leads to lower levels of dissolved oxygen in the water (Correll 1998). In addition to causing HABs, reservoirs are also environments that harbor high levels of certain parasites affecting Upper Klamath Chinook (Bartholomew et al. 2007), and Chinook downstream from dams have been observed to have heightened infection rates from those parasites due to higher exposure doses (Bartholomew et al. 2007).

Channel morphology is altered by dams as well. Chinook salmon need a variety of different stream features to host a complicated interplay of biological and physical processes; they need the correct grades of gravel, the right depths and prevalence of deep pools, the existence of large woody debris, and the right incidence of riffles (Montgomery et al. 1997). Dams alter stream morphologies greatly, leading to a much narrower channel and a less complicated environment (Van Steeter & Pitlick 1998), which in turn leads to lower Chinook salmon populations (Montgomery et al. 1997). Meanwhile, reservoir morphology contributes to lower levels of dissolved oxygen (Cole & Hannan 1990). Low levels of dissolved oxygen have been noted on the Shasta River below the Dwinnell Dam, (CRWQCB 1993). The presence of dissolved oxygen is

critical for the health of downstream fish populations. The particular effects of dissolved oxygen on Upper Klamath Chinook include serious problems with egg and embryo survival, as well as changes in behavior.

Dams have had a major impact on Upper Klamath Chinook populations. They have blocked off habitat throughout the Basin, prevented essential spawning gravel from traveling downstream, damaged water quality and changed channel morphologies of Klamath Basin streams. Dams both decrease available habitat and add to significant existing water quality problems in the Klamath.

### *Water withdrawals*

Water withdrawals also pose a significant risk to UKTR Spring Chinook (NMFS 2009, J. Katz, pers. comm. 2010). Since 1906 and the start of the Bureau of Reclamation's Klamath Project, a large portion of Klamath Basin surface and ground water has been withdrawn for agricultural uses. For decades this was done without considering the effects on anadromous fish in the Basin, and on Upper Klamath Chinook in particular (Foster 2002, Hecht & Kamman 1996). Agricultural water withdrawals have had a major impact on Upper Klamath Chinook populations, as resulting low flows and high temperatures cause stress and direct mortality of fish, contribute to disease prevalence and severity, and decrease Chinook egg survival.

The Project was constructed in order to reshape the dry hills of the Klamath Basin into agricultural land (Foster 2002), and wildlife have long played an inferior role in shaping land use policies in the Basin (Foster 2002). Historically, the Klamath Basin hosted a vast system of wetlands, shallow lakes, and marshes that effectively stored water during the wet season and released water in the main stem rivers during dry summer months, providing cool, clean water to fish and wildlife (Foster 2002). Today, over 80% of these wetlands have been drained in the interest of agriculture (Doremus & Tarlock 2003), eliminating key natural water storage resources in the basin. Without increased water storage and with intense competing uses, water withdrawals for agricultural use are, in their ongoing inefficient form, incompatible with the survival of Upper Klamath Chinook (Doremus & Tarlock 2003).

Water withdrawals in the Basin have increased steadily since they began and threaten fish survival in the Basin. In the Trinity River, from 1964-2004, 75-90% of the River's water was rerouted to the Central Valley for agricultural purposes (Moyle et al. 2008). Diversions into the A Canal (the primary diversion channel to the Klamath Project) increased from approximately 190,000 acre feet in 1929 to 290,000 acre feet in 1989 (Hecht & Kamman 1996), and 350,000 in 2010 (NMFS 2010). Under the pending Klamath Basin Restoration Agreement, farmers would be guaranteed levels close to the current average and significantly higher than historical rates, at 330,000 acre-feet (KBRA 2010), an amount incompatible with Chinook recovery and survival. The 2010 NMFS Biological Opinion on the Klamath Project stated that the lowered summer flows are undoubtedly connected to decreasing coho populations (NMFS 2010). Because Upper Klamath Chinook live in the same habitat as the species addressed in the Biological Opinion, the effects of withdrawals may be extended to Chinook salmon as well (NRC 2004). Since the listing of coho, stream flows in the Klamath Basin increased only briefly in 2001, before political pressure from irrigators forced the Bureau of Reclamation to resume irrigation in 2002 (Doremus & Tarlock 2003). The Ninth Circuit decision revising the NMFS ruling has supported resident coho, but has not resolved the Basin's overall crisis (NMFS 2009).

The Shasta and the Scott rivers are currently all but uninhabitable for Upper Klamath Chinook (Chandler 2009). In the summers of 2008 and 2009, both the Scott and Shasta rivers were at their lowest levels since flow recording began, with the Scott River's flow falling to two cfs on August 14<sup>th</sup> 2009, despite the fact that precipitation that year was at 77%. The Shasta River shared the Scott's predicament, with its flows almost reaching six cfs on October 11, 2008, when fall Chinook normally spawn.



Water withdrawals have altered the natural hydrograph of the river and increased the seasonal variability by decreasing summer flows, which are most essential for the fall run of Upper Klamath Chinook (Hecht & Kamman 1996). The Upper Klamath Basin, with its porous volcanic rock and numerous wetlands and lakes, was historically a natural storage facility, contributing a large proportion of stream flows during drought years as well as late-summer months (Hecht & Kamman 1996), with the snowpack contributing to flows mostly during the spring and summer (Hecht & Kamman 1996). One major effect of the combination of water withdrawals and dams is that the snowmelt peak that increased flows in spring and early summer is greatly reduced (Hecht & Kamman 1996). In 2010, the NMFS Biological Opinion stated that the altered hydrograph from the Klamath Project was harming coho (NMFS 2010). Chinook fry require water flow rates above certain levels (Allen 1986), and it is likely that this seasonal reduction in water flows arrives to the detriment of Upper Klamath Chinook populations.

High temperatures caused by water withdrawals and resulting low flows are a serious threat to Upper Klamath Chinook, causing increased stress levels and mortality. The temperatures in three Klamath Basin tributaries were measured every day in August and September of 2002. Average temperatures during September 2002, before the fish kill, ranged from 23°C to 17°C (Guillen 2003). Research shows that water temperatures in the Shasta exceeded 21°C on a daily basis for the entire summer season and through September during both 2002 and 2003 (Flint et al. 2005). Maximum temperatures in the Shasta reached nearly 30°C in mid-July, far above temperatures which can lead to Chinook stress and mortality (Flint et al. 2005). Increased water temperatures due to low instream flows have affected spring Chinook in particular (NRC 2004). Spring Chinook generally need temperatures below 16°C due to disease prevalence and loss of egg viability; but the deep pools holding spring Chinook in the Salmon river have temperatures often exceeding 20°C (NRC 2004).

Low flows and warm temperatures caused by water withdrawals also inhibit migration and cause crowding which create ideal conditions for disease outbreaks (McCullough 1999, NRC 2004). This was demonstrated during the Klamath Basin fish kill of 2002. Withdrawals above Iron Gate Dam in September of this year, immediately before the fish kill, reduced flows from the dam from an estimated 1441-1470 cfs (cubic feet per second) to 759 cfs (Guillen 2003) and these low flows were implicated as a cause for the rapid spread of Ich and Columnaris.

Other diseases thrive under warmer conditions as well. Many diseases that affect the Upper Klamath Chinook population are dormant at temperatures below 15.6°C (McCullough 1999). Increased levels of *Ceratonova shasta* infection in Klamath and Trinity Chinook populations Chinook were noted in 2009, with especially high rates immediately below the Iron Gate Dam where high temperatures are most apparent, upstream of major tributaries (True et al. 2010). This effect is no doubt also partly due to the fact that the stagnant, warm waters of reservoirs are ideal environments for *C. shasta* and their polychaete hosts (True et al. 2010).

Water withdrawals which lead to lower flows and warmer stream temperatures drastically decrease Chinook egg survival (McCullough 1999). The EPA has determined that temperatures above 13°C are unsuitable for Chinook spawning (EPA 2003). Temperatures above 15.6°C result in near total mortality for Chinook eggs (McCullough 1999). Higher water temperatures also result in smaller alevins and fry, as well as higher rates of alevin abnormality (McCullough 1999). The increased temperatures in the Klamath River in September and October have narrowed the available incubation period for Chinook eggs (Hecht & Kamman 1996) and may limit the species' overall reproductive success.

Water withdrawals are prevalent throughout the region and have caused dramatic changes to Upper Klamath Chinook habitat. This represents a persistent and ongoing threat to the long-term survival of this species in the Klamath Basin.

## *Logging*

Historically, the Klamath Basin was heavily forested, with forest covering approximately 80% of the Upper Klamath Lake watershed alone (NRC 2004), providing stability and shade for streams. Logging in the Klamath Basin, after its beginning in the 1850s, expanded rapidly starting in the 1910s (NRC 2004); 120 million board feet of timber were logged in the upper Basin in 1920, and by 1941 timber harvesting increased to 808.6 million board feet in the upper Basin alone (NRC 2004). As of 2004, approximately 400 million board feet of timber were logged in the upper Basin annually (NRC 2004). Logging also involves the construction of road systems. In the Scott River watershed alone, more than 288 miles of logging roads were constructed as of 2004, as well as more than 191 miles of skid trails (NRC 2004). Logging is a particularly high threat for spring Chinook (J. Katz pers. comm. 2010). Logging poses a significant threat to Chinook habitat by increasing stream erosion, sedimentation and turbidity, blocking Chinook access to habitat, decreasing riparian shade, decreasing the presence of large woody debris, and leading to complications with wild fire.

Erosion and the resulting sedimentation of streams is likely the largest threat to Upper Klamath Chinook caused by deforestation. The Klamath Basin's geomorphology is particularly vulnerable to erosion, because of the steep and unstable slopes of the region (Moyle et al. 2008), and the particularly erosive soils that underlie much of the Basin, particularly in the Scott and Trinity River watersheds (NRC 2004). In the Upper Klamath Lake watershed, more than 73% of forest land is subject to severe erosion caused by logging (NRC 2004). Logging and associated road construction has long-lasting effects on the sedimentation and turbidity of nearby streams (Klein et al. 2008). Indeed, the sediment contribution to streams by roads is often greater than that from all other land-use activities combined (NMFS 1996). The construction of roads and skidtrails in the lower Klamath Basin has been a "major source" of fine sediment in the Basin (NRC 2004). One study found that in the Scott River, average erosion for a road surface alone is 11 tons per acre; including the entire road prism, this figure rises to 149 tons per acre (Sommerstram et al. 1990). Skid trails, created during logging projects, are even more erosive, with skid-trails in the Scott averaging an annual 239 tons of soil loss per acre (Sommerstram et al. 1990). It is estimated that 10%-55% of the eroded soil makes it into the Scott River as sediment (Sommerstram et al. 1990).

Furthermore, sediment is added to streams in logged areas long after the initial logging project has been completed (Klein et al. 2008). Indeed, the timber harvest rate seems to be the biggest factor contributing to high levels of turbidity measured in a stream, with an unlogged area made up of highly erosive geology, near the Klamath Basin, showing low turbidity levels (Klein et al. 2008), while logged streams nearby, with less erosive geology, showed higher turbidity levels (Klein et al. 2008).

Increased turbidity and sedimentation create adverse conditions for Chinook. The particular effects of fine sediment on Chinook and its habitat include lowered levels of dissolved oxygen, suffocation of eggs and alevins, and lowered ecosystem productivity, which results in lower levels of food available for juveniles (Cordone & Kelley 1961).

Logging has resulted in blocked and destroyed habitat for Chinook in the Basin. Spawning habitat has been restricted in the Klamath Basin during periods of low flows by aggradations due to erosion (USBR 2001) as well as through the creation of impassible barriers such as culverts (Hoffman & Dunham 2007). Shallow landslides caused by logging and road construction scour streambeds and decrease stream complexity, destroying Upper Klamath Chinook habitat (Dietrich & Real de Asua 1998). The incidence of shallow landslides is greatly increased by the presence of logging (Dietrich & Real de Asua 1998). Habitat is also undermined as sediment leads to fewer deep pools (Quigley & Arbelbide 1997).

Logging and associated roads have also been shown to lead to decreases in riparian vegetation (Quigley & Arbelbide 1997) which leads to increased stream temperatures (Bartholow 2000). Indeed, it is likely that the

largest contribution to stream temperatures in most rivers is linked to decreased riparian vegetation (Bartholow 2000). The Shasta River, due to its structure—a relatively narrow channel—is particularly vulnerable to the lack of riparian shade (NRC 2004), and it is estimated that mature riparian vegetation would lower average maximum temperatures from 31.2°C to 24.2°C (NRC 2004).

Another effect of logging is reduced presence of large woody debris (LWD) in streams (Moyle et al. 2008). LWD is an essential element of Upper Klamath Chinook habitat (Rinella et al. 2009), as it helps form and maintain the deep pools necessary for juvenile Chinook, while aiding the recruitment of spawning gravel and creating cover for Chinook from predation (Rinella et al. 2009). LWD also contributes to stream productivity by adding habitat and food for the macrobenthic invertebrates that serve as food for juvenile Chinook (Rinella et al. 2009). Studies have shown that streams with LWD tend to harbor more salmonids, while LWD removal has been shown to lead to salmonid population decline (Rinella et al. 2009). In the Klamath Basin, logging on the Shasta River watershed has resulted in particularly low levels of LWD (NRC 2004). However, the 2010 coho Biological Opinion has found that lack of LWD is an issue in a “variety” of northern California and southern Oregon coho streams, many of which are also used by Upper Klamath Chinook (NMFS 2010)

As logging increases, so does the prevalence of wildfires (NRC 2004). The logging of old, large trees, especially when combined with fire suppression, results in more dense undergrowth, susceptible to fires (NRC 2004). Loggers often leave behind unsellable branches and detritus, which increase fire prevalence and severity (Donato et al. 2006). Since the early 1900s, the Salmon River, the last remaining viable habitat for Upper Klamath spring Chinook, has been battered by damaging crown fires, and now more than 50% of the Basin has burned (NRC 2004) with devastating effects. The extent and severity of large scale fires in the Salmon River watershed has increased over time, largely as the result of fire suppression efforts over the past century and an overall increase in heating and drying trends. In less than 15 years, from 2000 to 2014, over 43% of the Salmon River watershed has burned in mostly large fire events, with some areas burning multiple times at high severity (SRRC 2018). Short-term effects of wildfires on stream habitat include direct increases in stream temperatures, changes in stream pH, and the addition of toxic chemicals to the water (Engstrom 2010). Longer term effects include chronic and pulse erosion, channel reconfiguration, decreases in quality and quantity of large woody debris, reductions in streamside vegetation, and increases in both turbidity and stream sedimentation (Engstrom 2010).

After a fire has swept through the forest, permits are often granted for “post fire” or “salvage” logging, in an attempt to reduce future fires by taking out dead trees (Donato et al. 2006). However, there is evidence that post fire logging actually increases the risk of future fires (Donato et al. 2006), while also significantly reducing the regeneration rate of the forest (Donato et al. 2006). Studies on post fire logging after the Biscuit fire in the nearby Siskiyou National Forest (Donato et al. 2006, Thompson et al. 2007), found increased fire severity and decreased levels of regeneration in areas that have been “salvage” logged in comparison to areas left intact. Both scenarios have adverse effects on sediment levels in rivers as well as water temperatures, driving both effects upwards and consequently increasing the harm done to Upper Klamath Chinook populations.

Indirectly, logging roads also lead to habitat damage by providing access for forms of recreation that are harmful for Chinook (Quigley & Arbelbide 1997).

A significant portion of land in the Klamath River Basin remains open to logging. Land ownership in the Basin is 35 percent private, which is largely open to logging and urban and agriculture development with few protections in place for Chinook salmon or their habitat. In addition, there are over 700,000 acres, or roughly 16% of the basin, of Bureau of Land Management and the U.S. Forest Service lands that are designated as matrix lands under the Northwest Forest Plan, which are largely open to logging. See Table 3 for additional land ownership information:

Table 3.

<b>Land Ownership in the Klamath River Basin Downstream from Dams</b>			
Agency	Land Use Allocation	Acres	% Watershed
U.S. Forest Service		2,772,123	62.66
	Adaptive Management Area	335,264	
	Adaptive Management Reserve	23	
	Administratively Withdrawn	80,482	
	Congressionally Reserved	732,577	
	Late Successional Reserve	825,339	
	Late Successional Reserve (Murrelet)	694	
	Late Successional Reserve (Owl)	15,849	
	Matrix	640,646	
	Riparian Reserve	132,274	
Private		1,533,024	34.65
U.S. Bureau of Land Management		98,179	2.22
	Adaptive Management Area	1,807	
	Administratively Withdrawn	6,104	
	Congressionally Reserved	4,462	
	Late Successional Reserve	4,166	
	Late Successional Reserve (Owl)	341	
	Matrix	66,191	
	Riparian Reserve	13,666	
Other*		20,860	0.47
Total Watershed Area		4,424,186	

\*Other land owners include California Department of Fish and Game, California Department of Forestry and Fire Protection, California Department of Parks and Recreation, California State Lands Commission, City of Etna, Happy Camp Community Services District, Lake Shastina Community Services District, Other State Land, The Nature Conservancy, County of Trinity, U.S. Bureau of Reclamation, U.S. National Park Service, City of Weed, City of Yreka, and Weaverville-Douglas City Recreation District.

Logging remains a serious issue for Upper Klamath Chinook. Despite the legacy of sediment-choked streams, dangerously warm waters, and fire-vulnerable forests left by 100 years of heavy logging, forest management has continued in a destructive and unsustainable direction (NRC 2004). In combination with elements like water withdrawals and mining, what once might have been a mere irritant to Upper Klamath Chinook populations is further aggravating existing and serious threats to survival.

### *Mining*

Historic mining in the Klamath Basin has caused damage to Upper Klamath Chinook habitat through the rearrangement of the landscape, increased sediment and mercury pollution. These legacy affects persist to

this day in the form of greatly degraded habitat that is resistant to recovery through natural processes. More recently, suction dredge mining has continued to affect Chinook in the Basin through the entrainment of fish and their food, increased erosion and the associated complications with sediment and turbidity. Also, suction dredge mining causes the destabilization of spawning and downstream habitat.

Beginning in the 1850s, miners arrived in the Basin in great numbers and major human-caused changes to Klamath Basin geography and ecology became widespread (NRC 2004). During the midnineteenth century, gold rush miners used environmentally harmful methods of extracting gold from streams without regard for consequences (NRC 2004). One method, implemented in 1853, involved using high pressure water to blast away dirt and uncover placer deposits (NRC 2004). Many creeks were diverted into reservoirs for this purpose, and the jets of water unleashed sometimes washed away entire hillsides (NRC 2004). Much of the landscape in the Klamath Basin has been rearranged by this form of mining (NRC 2004). In California, before a court order mitigated some of the most harmful practices in 1884, hydraulic miners washed an estimated  $1.6 \times 10^9$  yd<sup>3</sup> of sediment into the streams, hard rock miners created  $3 \times 10^7$  yd<sup>3</sup> of mine tailings, and dredge miners left behind  $4 \times 10^9$  yd<sup>3</sup> of debris, largely in the Klamath Basin (NRC 2004). Using the Salmon River sub-basin as an example, the Salmon River Floodplain Habitat Enhancement and Mine Tailing Remediation Project, Phase 1: Technical Analysis of Opportunities and Constraints, summarizes the legacy mining effects as follows (Stillwater, 2018):

One of the most important factors leading to the decline and continued low abundance of anadromous salmonids in the Salmon River, and in particular spring-run Chinook, is the legacy effect of historical placer mining on channel and floodplain habitat conditions throughout the mainstem and larger tributary reaches (Stumpf 1979, SRRC 2017). Hydraulic and dredge placer mining in the Salmon River between about 1870 and 1950 led to profound and lasting changes, eroding over 1,859 acres adjacent to the mainstem and larger tributary channels and delivering an estimated 20.3 million cubic yards of sediment to the river (Hawthorne 2017, de la Fuente and Haessig 1993). Placer mining denuded floodplains and adjacent river terraces and hillslopes, reduced riparian shade cover, and exposed the stream channel and surrounding areas to increased solar radiation.

Delivery of hydraulic mine debris resulted in as much as 5 meters of channel aggradation, on average, throughout the predominantly alluvial reaches within the Project area. Aggradation by hydraulically mined sediment widened and shallowed alluvial reaches, filled pools, reduced the complexity and connectivity of floodplain habitats, and led to coarsening and armoring of the channel bed. Coarse sediment stored in the bankfull channel, denuded floodplains, and mine tailings on terraces along the river corridor continues to prevent riparian vegetation establishment, and due to the increased exposure to solar radiation and thermal mass, creates a significant heating effect. These impacts significantly reduce the amount and quality of spawning, oversummering, and over-wintering habitat and decrease the cumulative channel length that remains thermally suitable for salmonids during the summer, thereby constraining population productivity and increasing extinction risk. These legacy impacts to the channel and floodplain inhibit natural recovery and require intervention to recover within human and salmon population time scales.

Historically, gold mining involved the use of mercury, large quantities of which was released back into the Klamath River (NRC 2004). It is estimated that with hydraulic mining, approximately one pound of mercury was released for every three to four ounces of gold recovered (NRC 2004). Much of that mercury remains in Klamath Basin soils and sediments, affecting Upper Klamath Chinook through leaching, as well as any animal or human that consumes them (NRC 2004). Even in the 19<sup>th</sup> century, the California government acknowledged the effects of mining on Klamath Basin salmon, and in 1852, it enacted its first salmon statute, though this piece of legislation had little practical effect (NRC 2004).



Much of the mining activity in the 19<sup>th</sup> century still affects whole streams in the Klamath Basin, and some areas, such as the Scott River, have been permanently damaged (Moyle et al. 2008). Even the Salmon River, now the last bastion for UKTR Spring Chinook, has approximately 20million cubic yards of sediment, unleashed by mining between 1870 and 1950, slowly making its way downstream (Hawthorne 2017, de la Fuente and Haessig 1993). This sediment harms juvenile habitat, fills in the deep pools needed for adult Chinook, and degrades spawning habitat by eliminating the correct grade of gravel (Moyle et al. 2008). According to the findings of a recent and extensive assessment of mining effects on floodplains and anadromous fish habitat in the Salmon River, “Channel and floodplain aggradation resulting from historical hydraulic mining widened and shallowed alluvial reaches, filled pools, reduced the complexity and connectivity of floodplain habitats, and led to coarsening and armoring of the channel bed. Coarse sediment stored in the river channel, denuded floodplains, and mine tailings along the river corridor continue to create a significant heating effect. These legacy impacts to the channel and floodplain inhibit natural recovery and require intervention to recover within human and salmon population time scales” (Stillwater 2018). Old gold mining practices have also left their mark on the Trinity River, an area of particular concern for mercury contamination (Alpers et al. 2005).

More recently, suction dredge mining has been used for extracting gold from the Basin. Dredge mining has been operating in California continuously since the invention of the suction dredge in the 1960s (CDFG 2009), and Upper Klamath Chinook populations have been directly impacted by this activity. Effects of suction dredge mining include the entrainment of juvenile fish and eggs (Harvey & Lisle 1998), as well as the entrainment of macrobenthic invertebrates that serve as food for juvenile Chinook (Moyle et al. 2008). Apart from entrainment of macrobenthic invertebrates that serve as an important food source for juveniles, the exposure of new substrate and the deposition of sediment in the streams causes localized reductions in both macrobenthic invertebrate presence and diversity (Harvey & Lisle 1998).

Dredging has long-term erosive consequences, increasing the sediment load of streams and altering habitat by filling deep pools and eroding stream banks that formerly served as shelter for the Chinook. Effects can last for years after the dredgers have left (Harvey & Lisle 1998). Similarly, dredging of riffle crests can cause them to erode, potentially destabilizing spawning habitats, filling deep holes, and destabilizing downstream reaches (Harvey & Lisle 1998). Furthermore, dredge mining that has disturbed riffle crest tends to channel the streamwater towards a stream bank, increasing streambank erosion (Harvey & Lisle 1998).

Suction dredge mining also stirs up sediment, adding to a stream’s turbidity (Harvey & Lisle 1998). Increased turbidity resulting from dredge mining can have negative effects on Upper Klamath Chinook, particularly juveniles. Increased levels of suspended solids in the water seem to result in increased foraging time by juvenile Chinook, as it reduces their reactive distance and prey capture success rate (Harvey & Lisle 1998). Higher levels of suspended sediment can also reduce primary production in a stream, as the sediment blocks off light needed for photosynthesis (Henley et al. 2000). This limits food available for organisms at higher trophic levels (Henley et al. 2000), including juvenile Chinook.

Suction dredge mining can also increase deposition of fine sediment downstream (Harvey & Lisle 1998), reducing both the benthic invertebrate populations that serve as food for Chinook (Harvey & Lisle 1998), and the availability of habitat for alevins inhabiting the benthic zone (Harvey & Lisle 1998). Increased fine sediment deposition also reduces dissolved oxygen levels by filling interstices between gravel and reducing water circulation in the hyporheic zone (Henley et al. 2000). The hyporheic zone is the zone of gravel and sediment that composes the streambed, where groundwater and surface water interact (Findlay 1995), and where Upper Klamath Chinook deposit their eggs. Increased fine sediment deposition due to mining is of particular concern in the Trinity and Salmon rivers (NRC 2004).

Suction dredge mining leads to the destruction of Chinook redds (Harvey & Lisle 1999). Miners dredge up and then deposit gravel that is seemingly the perfect size and density for Chinook redds, attracting spawning Chinook. The tailings placed back into the stream are unsupported however, and during the high flow period in winter after the Chinook have used the sediment for spawning, the gravel is swept downstream, killing any eggs present (Harvey & Lisle 1999). The same instability kills Chinook alevins inhabiting the gravel substrate (Harvey & Lisle 1998).

Mine tailings from suction dredge mining also reduce deep pools (Harvey & Lisle 1999) that are essential habitat for both juvenile and adult Chinook. The presence of unstable mine tailings used by Chinook as spawning grounds has been noted throughout the Klamath, Salmon, and Scott rivers and their tributaries (Moyle et al. 2008).

Other general effects include the loss of channel complexity, the loss of pool habitat, and the loss of effective large woody debris (NMFS 1998). Finally, the constant noise and turbidity caused by suction dredge mining raises the stress of Upper Klamath Chinook, increasing the possibility of premature death (Moyle et al. 2008).

Suction dredge mining currently poses a threat to Upper Klamath Chinook. Recently, California recognized the threat posed to salmonids by suction dredge mining and temporarily banned it in California streams, pending environmental review. The long-term damage has already occurred to Upper Klamath Chinook habitat, and with the very limited budget California can put towards enforcing the ban, many suction dredge miners are able to continue their activities with impunity. Mining has historically caused major damage to Chinook habitat in the Klamath Basin and remains a threat to their continued existence.

### *Chemicals*

Land use in the Klamath Basin has resulted in the contamination of the region's waters by a variety of chemicals including pesticides, herbicides, and insecticides. Basin agricultural lands discharge chemical and fertilizer-contaminated wastewater, and municipal wastewater also enters the system through the Lost River. Combined, these wastewater discharges result in harmful algal blooms, higher aquatic pH levels, lower levels of dissolved oxygen, and high concentrations of ammonia (NCWQCB 2010), all of which are destructive for Chinook populations (Moyle et al. 2008).

Pesticides, insecticides, and herbicides have been used in the Klamath Basin for at least 60 years (Dileanis et al. 1996). This includes the heavy use of dangerous organochlorine pesticides such as DDT in the 1950s and 1960s, which are found in Tule Lake and elsewhere in the Basin (Dileanis et al. 1996). In the early 1990s, 16 pesticides were reported in the waters of Tule Lake Refuge, with higher concentrations measured near agricultural drains (Dileanis et al. 1996). Between 1997 and 2001, approximately 27,000 pounds of the active ingredients of four forestry herbicides were used in the Klamath Basin. In 2002, research determined that some of the forestry herbicides were drifting into waterways (Wofford et al. 2003). So far in 2010, pesticide use proposals for 81 pesticides (including those known to be dangerous to wildlife) have been granted for lease lands within the Tule Lake and Lower Klamath National Wildlife Refuges (USBR 2010).

In long term studies, USGS (2009) found high levels of a variety of pollutants especially in the 20 miles between Link River and Keno Dam. Given the high levels of toxicity, the State of Oregon classifies this 20 mile reach as "water quality limited," as required by Section 303(d) under the Clean Water Act (USGS 2009). Water quality in this region affects the quality of the entire main stem of the Klamath River. (Sullivan et al. 2010).

In 2008 the EPA issued a Biological Opinion on "the effects of the U.S. Environmental Protection Agency's (EPA) proposed registration of pesticide products containing the active ingredients chlorpyrifos, diazinon,

and malathion on endangered species, threatened species, and critical habitat that has been designated for those species" (NMFS 2008). The Opinion assesses the effects of these pesticides on 28 listed Pacific salmonids and determines that the continued use of these chemicals is likely to jeopardize the continued existence of 27 listed Pacific salmonids and to destroy or adversely modify critical habitat for 25 of 26 listed Pacific salmonids, with critical habitat, including the Klamath Basin's Southern Oregon/Northern California Coast Coho (NMFS 2008). The population-level consequences of pesticide use discussed in this report included impaired swimming and olfactory-mediated behaviors, starvation during a critical life stage transition, death of returning adults, additive toxicity, and synergistic toxicity. Upper Klamath Chinook also negatively affected by these pesticides.

Diazinon, an organophosphate insecticide commonly used for general pest control, has been found to affect the olfactory nervous system of Chinook (Scholz et al. 2000). As Chinook depend largely on their olfactory system for homing, reproductive behavior, and pheromone activated anti-predator behavior, disruption of the sense of smell has wide-ranging negative effects on Chinook populations (Scholz et al. 2000). This disruption likely increases occurrence of Chinook "straying" (spawning fish returning to nontraditional spawning grounds), with results ranging from hybridization between hatchery and wild fish (Scholz et al. 2000) to lower densities of spawning Chinook in streams, leading to reproductive failure. Diazinon also negatively affects anti-predator behavior and the reproductive behavior of male Chinook (Scholz et al. 2000).

Other chemicals such as carbaryl, the third most commonly used insecticide in the United States, have been shown to neurologically affect salmonids (Labenia et al. 2007). Furthermore, pesticides seem to act synergistically, such that sub-lethal doses of two different pesticides may have effects greater than when they are encountered individually (Laetz et al. 2009). In one study, every pesticide tested acted synergistically with every other pesticide, and malathion and chlorpyrifos proved to be a particularly harmful combination (Laetz et al. 2009); both of those pesticides have been approved for use on Klamath Basin National Wildlife Refuge lease lands (USBR 2010), and are likely used to a much greater extent throughout the Klamath Irrigation Project.

Fertilizer and organic nutrients from agriculture and municipal wastewater present a serious threat (USGS 2009) by fueling algal blooms, depleting dissolved oxygen levels, and elevating pH levels (Smith et al. 1999). Algal blooms and subsequent fish die-offs are also linked to the presence of ammonia in the water (Rykboost & Charlton 2001). In the United States, eutrophication caused by agricultural runoff is the nation's largest water pollution problem (Smith et al. 1999) and the Klamath Basin is no exception. The Klamath Straits Drain, a concrete canal which collects the upper Basin's agricultural, refuge, and municipal wastewater and discharges it into the main stem of the Klamath River, has been designated "water quality limited" on Oregon's 303(d) list for dissolved oxygen and ammonia levels year round and for the water's pH and chlorophyll concentrations during the summer (USGS 2009). Discharge from the Klamath Straits Drain is impacted by high concentrations of total phosphates, biochemical oxygen demand, total solids, and ammonia and nitrate nitrogen throughout the year (ODEQ 1995).

Lowered dissolved oxygen (DO) levels due to impaired water quality as a result of agricultural and/or municipal inputs inflict harm on Upper Klamath Chinook (NCWQCB 2010). During July of 2008, the levels of DO measured above the Keno Dam were far below levels recommended for salmonids; if DO levels average lower than 3-3.3 mg/L, 50% mortality of juvenile salmonids is likely, while in water above 20°C, daily minimum DO levels of 2.6mg/L are required to avoid 50% mortality (NCWQCB 2010). However, in 2008 from mid-July to mid-September at the Keno Dam, DO levels repeatedly dropped below one mg/L (sometimes to as low as .38 mg/L), and rarely rose to three mg/L (USGS 2009, Appendix B).

Nutrient loading of stream systems can lead to higher pH in river systems (NCWQCB 2010). The effects of a high pH on Upper Klamath Chinook are exacerbated by high temperatures (NCWQCB 2010), which is

already a major water quality problem in the Klamath Basin. Due to impaired water quality as a result of agricultural, municipal, and other inputs as discussed, the Klamath River's pH in the summer often rises above 8.5, and sometimes reaches 9. At the Miller Island Boat Camp in 2008, the river's pH in early July, measured daily, had several consecutive days with pH values ranging from 9.06-9.53 (USGS 2009, Appendix B). Few direct studies examine the effects of high pH values on Chinook but rainbow trout are stressed by pH values above 9 and generally die if the pH value rises above 9.4 (NCWQCB 2010).

Nutrient loading in the Klamath River can increase ammonia levels as higher concentrations of nitrogen enter the water (NCWQCB 2010). High nitrogen concentrations, a product of water runoff from fertilized agricultural fields, also increases the toxicity of the ammonia present, as higher pH levels result in most of the ammonia morphing into its deadlier, un-ionized form (NCWQCB 2010). Ammonia in the Klamath River has been noted at levels high enough to harm Chinook through a reduction in hatching success; reductions in growth rate and morphological development; and pathologic changes in tissues of gills, livers, and kidneys (NCWQCB 2010). Ammonia also reduces Chinook disease resistance and has been termed an exacerbating factor in Klamath River fish kills (NCWQCB 2010). The presence of high levels of un-ionized ammonia was noted in the Upper Klamath Lake in both 2007 and 2008 (USGS 2010).

In the Upper Klamath Lake, the combination of high pH (sometimes between 9 and 9.5 in late August) and temperatures (around 20°C at the same time; USGS 2010) with high levels of ammonia can be dangerous. On August 25<sup>th</sup>, 2008, ammonia was measured at 0.933 mgN/L (USGS 2010), far above "acute" levels of ammonia for salmonids (0.885 mgN/L when the pH is 9; NCWQCB 2010). The USGS found that ammonia concentrations in the Klamath River actually increased in the downstream direction, with significantly higher levels found at the Keno Dam when compared to the Link River Dam (USGS 2009).

Agricultural and municipal wastewater delivered into the Klamath River is a severe threat to Chinook. Pesticides, even at sub-lethal doses, can combine to alter Chinook behavior, with major consequences for Chinook survival and reproduction. The eutrophication of traditional Upper Klamath Chinook habitat in the Klamath Basin results not only in levels of dissolved oxygen low enough to cause serious harm to Chinook populations, but also causes elevated pH levels, high concentrations of ammonia, and the presence of toxins produced by algal blooms.

### *Grazing*

Grazing threatens UKTR Spring Chinook in the Basin because of the loss of riparian vegetation, loss of large woody debris, increased sediment in streams, the addition of excessive nutrients to streams, and lowered water tables.

Grazing in the Klamath Basin has occurred since the late 1800s. As early as 1880, overgrazed fields caused a disastrous winter for plant life resulting in the mass mortality of cattle across the Basin (NRC 2004). More widespread effects were quickly noted, as a geologist in the early 1900s found formerly flat streams cutting channels in the land, as run-off increased due to overgrazing (NRC 2004). In an effort to save the nascent Klamath cattle industry, government agents recommended that wetlands be drained and planted with hay to provide feed for cattle, and in the 1890s, ranchers obliged, draining wetlands along the borders of the Upper Klamath Lake to provide increased forage (NRC 2004). In addition to lost water storage capacity and lower water quality caused by wetland draining, the flood irrigation of pastures to create cattle feed as well as the switch to nonnative species of hay severed healthy riparian connections to the landscape (NRC 2004). Because cattle are attracted to riparian areas for grazing, damage caused by intense cattle presence is often concentrated in sensitive riparian areas (Belsky et al. 1999). The Scott and Trinity rivers have been degraded by under-regulated grazing and ranching, as have numerous small tributaries that contribute their flows to the Klamath River (NRC 2004). In the South Fork Trinity River, unsustainable grazing and farming practices, combined with large floods in 1964, have resulted in long-term

loss of viability to salmon populations (NRC 2004). Populations in the South Fork Trinity River have made little progress recovering in the intervening decades (NRC 2004).

One major effect of grazing in riparian habitats is the decrease in riparian vegetation. Throughout the Klamath Basin, there is evidence that unfenced grazing results in the loss of vegetation through animal consumption and trampling (NRC 2004). Grazing is the primary contributor to the lack of riparian vegetation in the upper Shasta River (NRC 2004). Loss of riparian vegetation leads to increased stream temperatures as well as a decrease in the quality of Chinook habitat through the loss of large woody debris (NRC 2004), increased erosion and sedimentation, all of which have highly damaging consequences to Chinook salmon.

Cattle also cause increased levels of nutrients to be added to river systems. The effects of season-long grazing in the past in the Sprague River (a major tributary to the Upper Klamath Lake) have resulted in the Oregon Department of Environmental Quality labeling the Sprague River in the Upper Klamath Basin as one of the worst streams in Oregon for non point-source pollution (NRC 2004). Animal waste from grazing adds nutrients to water systems that can result in HABs (Belsky et al. 1999). The Sprague River is a contributor of extremely high levels of phosphorus due to poor land use practices (NRC 2004), including grazing. As phosphorus is the primary factor limiting algal blooms in freshwater systems (Anderson et al. 2002), its input is likely to be a major cause of HABs, which can have large effects on downstream Chinook populations, through the release of toxins (EPA 2008) and lowered levels of dissolved oxygen (Correll 1998).

Grazing has also been implicated in lowering water tables; as water flows downhill during floods, it is trapped by riparian plants, slowing flows and allowing the water to percolate through the sub-soil to become groundwater (Belsky et al. 1999). Extensive grazing, combined with groundwater withdrawals and sprinkler irrigation is a significant contributor to the problem of low water tables in the Scott River watershed (NRC 2004, Van Kirk & Naman 2008). The impact of low water tables in these critical Klamath River tributaries and throughout the upper Basin translates directly to limited river flows and impaired water quality for Upper Klamath Chinook downstream.

The legacy effects of grazing have permanently harmed Upper Klamath Chinook habitat and current ranching practices continue to impair the viability of populations through impacts on water quality. For every cattle herd grazing on upper Basin rangeland, water quality for downstream Upper Klamath Chinook populations is further degraded.

## (2) overexploitation;

Commercial, recreational and tribal fishing have had a combined effect on Klamath River salmonids that have contributed to their decline since the 19<sup>th</sup> century (NMFS 2009; Snyder 1931). Both legal and illegal harvest combined pose a high threat for both spring and fall Upper Klamath Trinity River Chinook (J. Katz pers. comm. 2010). Harvest of Upper Klamath Chinook salmon has added to the decline of both the spring and fall runs and continues to threaten the long-term persistence of Chinook in the Basin (Moyle et al. 2008).

Moyle et al. (2008) identifies legal and illegal harvest as a major limiting factor affecting both spring and fall runs of Upper Klamath Chinook. Both illegal harvest of holding adults and legal, ocean and river harvests contribute to reduced spawning populations. Adults holding upstream in deep pools are especially vulnerable to illegal take; although these numbers are largely undocumented, it can be assumed that UKTR Spring Chinook holding in pools in the Klamath River and elsewhere in the Basin are affected by harvest from pools where they are holding prior to spawning. There is a general absence of UKTR Spring Chinook from populated areas in the Klamath, and in areas with easy access to humans, further suggesting that



illegal harvest is occurring. The illegal removal of even a small number of UKTR Spring Chinook likely has an intense effect on spawning populations (Moyle et al. 2008).

Because managing agencies do not treat UKTR Spring Chinook differently from UKTR Fall Chinook, UKTR Spring Chinook are taken legally in commercial and sport fisheries (Moyle et al. 2008). Harvest rates are defined based on combined spring- and fall-run numbers of both hatchery and natural origins; therefore, the dwindling populations of spring-run Chinook, especially wild-spawning populations are particularly vulnerable to being overfished under current management (Bilby et al. 2005). In fact, current management actions neglect to protect spring-run Chinook even when protections have been put in place to restrict fall-run Chinook harvest, essentially increasing pressure on the much smaller and more imperiled populations of spring-run Chinook. For example, after the final stock projections developed by the Pacific Fishery Management Council for Klamath River fall-run Chinook (which included spring-run return numbers) were projected to be the lowest on record, “the Fish and Game Commission adopted regulations on April 13, 2017 for a full closure of the 2017 Klamath River Fall-Run Chinook Salmon fishery in the Klamath and Trinity rivers” (CDFW 2017). The regulations went into effect August 8, 2017, after the spring-run Chinook had already entered the Klamath Basin and its tributaries. Even though low spring-run Chinook return numbers were counted as part of these projections, they were not granted equal protections to fall-run Chinook, and the daily bag limits on the Klamath River remained the same for the period of time that they were present in the river before fall-run Chinook entered the basin. During this time period, the only allowable salmon sport fishing on the Klamath River was spring-run Chinook, effectively increasing the pressure on dwindling spring-run Chinook during this year with the lowest projected returns.

(5) disease; or

Several diseases affect the Upper Klamath Trinity River Chinook salmon and will likely continue to pose a threat to this ESU in the future. Salmon are exposed to a variety of bacterial, viral and parasitic organisms throughout their life cycle, contracting diseases through both waterborne pathogens and through mingling with infected hatchery fish (NMFS 1998). It is possible for a fish to be infected with one or more pathogen but not to show signs of disease. Hatchery Chinook salmon appear to be more susceptible to disease than naturally spawning Chinook (NMFS 1998). Because Chinook salmon in the Klamath River Basin emigrate as juveniles and return to spawn when water temperatures and flows approach their limits of tolerance, they are particularly susceptible to disease (Moyle et al. 2008, NMFS 2009).

In 2002, a major fish kill occurred in the second half of September in the lowermost 40 miles of the Klamath River main stem. At least 33,000 Chinook died out of a total estimated run of 130,000 fish (NRC 2004). Although the original FWS report of estimated mortality claimed about 33,000 fall Chinook died in this fish kill, a more updated report by CDFG explains that the estimate was “conservative and DFG analyses indicate actual losses may have been more than double that number” (CDFG 2004). This was the largest known pre-spawning die-off recorded for the region and possibly the whole Pacific coast (Guillen 2003). Stressful environmental conditions in 2002 allowed columnaris and ich to sweep through a population of already stressed fish (Guillen 2003). Factors which combined included high temperatures, crowded conditions and low flows. In response to high water temperatures and low flows, fish stopped migrating and instead concentrated in cooler deep pools, creating optimal conditions for the proliferation of pathogens. All of the specimens examined during the fish kill were infected by ich and/or columnaris (Guillen 2003).

Columnaris is a bacterial infection affecting Upper Klamath Chinook salmon and is caused by *Flavobacterium columnare*. The disease is associated with pre-spawn mortality of spring-run Chinook especially when they are exposed to above-optimal water temperatures (Moyle et al. 2008). Columnaris is usually pathogenic at temperatures above 15° C and outbreaks are common in adult populations held at hatcheries in water at 15-18° C (Guillen 2003). The earliest sign of columnaris is a thickening of the mucus at various spots on the fish (Guillen 2003). When it becomes more developed, fish will show small bloody

spots on the skin. Eventually, respiratory and osmoregulatory function is lost at the gill surface and the fish dies (Post 1987). Although typically widespread, columnaris only causes widespread mortality when associated with high degrees of stress. This occurred during the 2002 fish kill in which columnaris was one of the two diseases implicated as a direct cause of mortality. By 2004, only 2.4% of fish examined were infected with *F. columnare* suggesting that it was not a significant problem in these fish in 2004 (Nichols and Foott 2005).

The other pathogen which directly caused the major fish kill in 2002 is ich disease, caused by the ciliated protozoan, *Ichthyophthirius multifiliis*. The optimal temperature for ich development is 21.1-23.9° C and within this range, higher temperatures cause faster replication of the parasite (Guillen 2003). Ich disease reduces the capacity for fish to absorb oxygen and excrete ammonia and mortality occurs when gills become too damaged to function (Post 1987). Studies show that higher water velocities reduce and may prevent ich disease outbreaks completely because of a decreased probability of the parasite finding a host before being swept downstream (Guillen 2003).

The USFWS and CDFG monitored the health and physiology of salmonids in the Klamath and Trinity River Basins from 1991-1994 and identified *Ceratonova shasta* as the most significant disease affecting juvenile salmon in the Klamath Basin (Nichols and Foott 2005). *C. Shasta* is a myxozoan parasite that appears in the mainstem and Upper Klamath River, Copco Reservoir, both Klamath and Agency Lakes and the lower reaches of the Williamson and Sprague Rivers (Moyle et al. 2008). It is often found in reservoir environments so that dams on the Klamath River have contributed to the spread of this parasite. Soon after Iron Gate Hatchery was established, operational problems associated with *C. shasta* began to occur and significant outbreaks continued to occur into the early 1980s (NMFS 1998). A 1989 study found that Chinook salmon at Iron Gate Hatchery had a 4% susceptibility to *C. shasta* and a 19% susceptibility at the Trinity River Hatchery (Carlton 1989 as cited in NMFS 1998). *C. shasta* infection appears to be accelerated when high densities of infected fish are combined with warm water temperatures (Foott et al. 2003).

Nichols and Foott monitored the health of juvenile Klamath River Chinook Salmon. They estimated that 45% of the population was infected with *C. shasta* (Nichols and Foott 2005). Of the fish infected with *C. shasta*, 98% were also infected with another myxozoan infection, *Parvicapsula minibicornis*. The dual infection suggested that the majority of fish infected with *C. shasta* as juveniles would not survive.

More recent studies have revealed some of the factors affecting incidence of *C. shasta* infections and identified this parasite as a potentially limiting factor to the survival of Klamath River Chinook. Petros et al. (2007) studied the effect of water flows on the incidence of *C. shasta* to find out whether drought exacerbated fish health issues by concentrating spores in reduced flows and compromising resistance through increased stress from warm water temperatures. The years 2005 and 2006 had higher flows than 2004 and exposure to *C. shasta* was less severe in the years with higher flows. However, the 2006 results were not as pronounced as expected given the magnitude of the spring 2006 water levels (Petros et al. 2007).

Bjork and Bartholomew (2009) investigated the effects of water velocity on presence of *C. shasta* in *Manayunkia speciosa*, the pathogen's intermediate polychaete host. In faster water velocities, the polychaete density was higher but the prevalence of *C. shasta* was lower and the severity of infection in fish was also decreased. Another study by Bjork (2010) showed that temperature had no effect on polychaete survival but that higher temperatures caused actinospore release in *C. Shasta* to occur earlier and in greater abundance. *C. shasta* infections can be expected to grow more severe in conditions of low flows and high temperatures.

*Parvicapsula minibicornis* the other myxozoan parasite common to the Klamath River and although often present, like *C. Shasta* it is not always abundant nor do the conditions always exist for large numbers of

Chinook salmon to be infected (Moyle et al. 2008). *P. minibicornis* appears to be highly infectious. It was estimated to infect 94% of the population of juvenile Chinook in the Klamath River in 2004 (Nichols and Foott 2005).

Another prevalent pathogen in the Klamath River Basin is Bacterial Kidney Disease (BKD) caused by the Bacterium, *Renibacterium salmoninarum*. In 1994, BKD was cited along with the trematode parasite, *Nanophyetus salmicola*, as one of the most significant pathogens affecting both natural and hatchery smolt health in the Basin (NMFS 1998). The pathogen can prevent fish from making the necessary changes in kidney function during smoltification (NMFS 1998). Also, the stress of migration can cause BKD to come out of remission (Schreck 1987).

Climate change is expected to cause increased water temperatures and therefore higher stress conditions that can be expected to increase the occurrence and severity of disease outbreaks among Chinook salmon in the Klamath Basin. Warmer temperatures favor disease outbreaks (Moyle et al. 2008). Disease has been a direct cause of mass mortalities in the Klamath Basin in the past and will present further challenges for their continued survival due to changing conditions in the future.

(6) other natural events or human-related activities.

As noted above, a century of dams and diversions has been a leading cause of UKTR Spring Chinook declines.

## **7. DEGREE AND IMMEDIACY OF THREAT**

Please see #1, population trend

## **8. IMPACT OF EXISTING MANAGEMENT EFFORTS**

As abundantly documented in this petition, Upper Klamath Chinook face severe threats from multiple factors. Existing regulatory mechanisms are entirely inadequate to address these threats and ensure the survival of the species. By considering Upper Klamath spring- and fall Chinook as part of the same ESU, NMFS has limited adequate protection of spring Chinook under the ESA so that they are directly at risk of extinction. Current federal and state regulations which may indirectly affect these fish lack the protection needed by Upper Klamath Chinook.

### *Federal Regulatory Mechanisms: U.S. Forest Service*

In the United States, the National Environmental Policy Act (NEPA) requires Federal agencies, including agencies within the Department of Interior, Department of Agriculture (e.g. United States Forest Service), and beyond, to consider the effects of management actions on the environment. NEPA does not, however, prohibit Federal agencies from choosing alternatives that may negatively affect Upper Klamath Chinook salmon.

Upper Klamath Chinook are listed as a sensitive species by the Forest Service in Region 5, requiring analysis of impacts to the salmon from management actions or changes under NEPA. Because NEPA does not require avoidance of harm, this affords little protection. The Forest Service must analyze the impacts of their actions on the species, but as above are not required to select alternatives that avoid harm to Chinook. Indeed, the Forest Service regularly plans timber sales, maintains and utilizes roads, allows livestock grazing and conducts other actions that harm Upper Klamath Chinook.

Relevant National Forest Plans include Six Rivers National Forest, Shasta-Trinity National Forest and Klamath National Forest. The forests are responsible for maintaining suitable fish habitat that will support well-distributed, viable populations of native fish. Forest service sensitive species including the Upper Klamath Chinook are considered in planning decisions such as habitat improvement and restoration. Sensitive species are considered when establishing key watersheds within National Forest Plans. Standards and guidelines for key watersheds include analysis prior to management activities, prioritization of sensitive species during restoration activities and restrictions on the building of new roads. National Forest Plans do not have the authority to maintain fish habitat on private lands nor to regulate actions by private parties which are destructive to Upper Klamath Chinook (mining, agriculture and timber operations) and the plans are therefore insufficient to protect Chinook salmon in the Basin.

The NWFP, signed and implemented in April 1994, represents a coordinated ecosystem management strategy for Federal lands administered by the USFS and BLM within the range of the Northern spotted owl (which overlaps considerably with the freshwater range of Chinook salmon).

The most significant element of the NWFP for anadromous fish is its Aquatic Conservation Strategy (ACS). This regional scale conservation strategy includes: (1) Special land allocations, such as key watersheds, riparian reserves, and late-successional reserves, to provide aquatic habitat refugia; (2) special requirements for project planning and design in the form of standards and guidelines; and (3) new watershed analysis, watershed restoration, and monitoring processes. These components are designed to ensure that Federal land management actions achieve a set of nine Aquatic Conservation Strategy objectives, which include salmon habitat conservation. In recognition of over 300 "at-risk" Pacific salmonid stocks within the NWFP area (Nehlsen et al., 1991), the ACS was developed by aquatic scientists, with NMFS participation, to restore and maintain the ecological health of watersheds and aquatic ecosystems on public lands. The ACS attempts to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and to restore currently degraded habitats. The approach seeks to prevent further degradation and to restore habitat on Federal lands over broad landscapes.

The overall effectiveness of the NWFP in conserving Upper Klamath Chinook salmon is limited by the extent of Federal lands and the fact that Federal land ownership is not uniformly distributed in the ESU. In some areas, particularly Bureau of Land Management (BLM) ownership, Federal lands are distributed in a checkerboard fashion, resulting in fragmented landscapes. This factor places constraints on the ability of the NWFP to achieve its aquatic habitat restoration objectives at watershed and river basin scales.

In addition, a significant portion of land in the Klamath River Basin remains open to logging under the NWFP. Land ownership in the Basin is 35 percent private, which is largely open to logging and urban and agriculture development with few protections in place for Chinook salmon or their habitat. In addition, there are over 700,000 acres, or roughly 16% of the basin, of Bureau of Land Management and the U.S. Forest Service lands that are designated as matrix lands under the Northwest Forest Plan, which are largely open to logging.

Under the National Forest Management Act, the Forest Service is required to "maintain viable populations of existing native and desired nonnative vertebrate species in the planning area" (36 C.F.R. §219.19). As with NEPA, this requirement does not prohibit the Forest Service from carrying out actions that harm species or their habitat, stating only that "where appropriate, measures to mitigate adverse affects shall be prescribed" (36 C.F.R. §219.19(a)(1)). This clause does little to limit long term impacts to salmonid habitat in the Klamath Basin. Also, these regulations are currently under review and any protection they afford may be removed at any time.

Despite all of these laws and plans, federal land managers have continued to plan and implement projects that harm Upper Klamath-Trinity River Chinook salmon. Destructive actions have included timber sales on steep slopes, logging of riparian reserves, failure to maintain, fix and remove roads as necessary, and problems with grazing, including inadequate and unenforced best management practices (BMPs). Also, the U.S. Forest service has failed to advocate for stream flows in the lower Scott River which is under their jurisdiction. Federal land managers in the Basin are not taking sufficient actions to manage for the persistence of Chinook salmon and better practices are necessary for conservation of these fish.

#### *Federal Regulatory Mechanisms: FERC*

The Federal Energy Regulatory Commission (FERC) is charged with relicensing the Klamath Hydroelectric Project (FERC P-2082-000) on the Klamath River every 20 to 50 years. The FERC license for operation of the Klamath Project expired in 2006 and FERC produced an Environmental Impact Statement (EIS) for the Project in 2007. In a new national era of dam removal, FERC has supported negotiations regarding removal of antiquated hydroelectric projects like on the Klamath River in place of intensive and costly dam improvements to comply with modern environmental laws. PacifiCorp and the Klamath River Renewal Corporation (KRRC) recently filed applications with FERC to transfer the dams to KRRC for license surrender and dam removal. FERC's decision on the application is pending.

When considering whether or not to list a species, NMFS is not to consider promised, pending or future management actions, but instead only the current management and status of the species. In numerous ESA listing cases, the USFWS has been forced by judicial action to reverse decisions not to list species because they relied on promised management actions; this includes decisions over the Barton Spring's salamander, Queen Charlotte goshawk, jaguar, Alexander Archipelago wolf, and coho salmon. It is imperative that NMFS consider only the current management and species status. States, federal agencies, and private interests can easily promise to protect and recover species in order to avoid or delay a potentially controversial listing; unfortunately, there are not means to ensure management agencies will follow through on promises, or that their actions will result in recovery. To protect species from ongoing destruction, modification or curtailment of habitat or range, listing under the ESA is required while management actions are being tested. If promised management actions result in substantial recovery, then such actions should be incorporated into a recovery plan for the species.

In response to the noted court decisions on various species' listings, USFWS developed a policy for evaluating the contribution of conservation efforts while considering the potential need for listing. This policy identifies criteria for determining the certainty a conservation effort and whether it is likely to be effective. (68 Fed. Reg. No. 60, 28 Mar. 2003). We have considered this policy when evaluating pending agreements in the Klamath Basin, and understand that NMFS should do the same when considering listing of the Upper Klamath Trinity River spring Chinook salmon. Clearly, the UKTR Spring Chinook is experiencing ongoing threats, placing it in danger of extinction and thus requiring protection as an endangered species, regardless of pending, untested, or promised management actions

The most recent genetic work on spring-run Chinook in the Klamath Basin suggest that even with dam removal, the lack of the spring-run timing allele in Upper Klamath Chinook source populations within a reasonable distance below the current dams will hinder restoration and natural spring-run Chinook recovery after dam removal. "These results highlight the need to conserve and restore critical adaptive genetic variation before the potential for recovery is lost." (Thompson, et al. 2018)

#### *State Regulatory Mechanisms: TMDL*



State mechanisms which affect Upper Klamath Chinook and their habitat include the establishment of Total Maximum Daily Loads (TMDLs) for chemical pollution in the Klamath River. The Klamath River is listed as a water quality impaired river under Section 303(d) of the Clean Water Act and as required by the Act, states are required to establish TMDLs for instate impaired waterways. Enforceability of TMDLs is difficult and insufficient. The continued occurrence of dangerous algal blooms in reservoirs in this river system clearly illustrates the inadequacy of this regulation. Federal regulators recently adopted new TMDLs calling for a 57% reduction in phosphorous and a 32% reduction in nitrogen and a 16% cut in carbonaceous biochemical oxygen from wastewater. Although the new TMDLs are intended to protect salmon resources, there are no implementation programs in place for controlling pollutant inputs from land use. Without these implementation plans, standards are unlikely to be met.

#### *State Regulatory Mechanisms: Mining*

California instated a ban on suction dredge mining in 2009 in response to a lawsuit from the Karuk Tribe referencing damage to fish habitat and water quality. This ban is clearly beneficial for Upper Klamath Chinook. However, the ban is temporary until the California Department of Fish and Game completes an environmental review of suction dredge mining. There is no guarantee that this mining practice will not be reintroduced after the environmental review occurs.

#### *Federal and State Regulatory Mechanisms: Fishing*

Fishing harvest allocations are decided annually based on input from federal, state, regional, and tribal bodies. In general, tribes maintain the right to fifty percent of the total annual harvest. Within tribal and non-tribal fishing, further allocations are assigned for commercial ocean fisheries, sport, and subsistence fishing. Harvest quotas are based on projections for run size each year and attempt to maintain a minimum spawning escapement of 35,000 fish to protect the runs for the long-term. Overfishing is an aggravating factor to the grim future of Upper Klamath Chinook; fishing regulations alone will not provide for the continued existence of this ESU. As noted above in section 6.2 over-exploitation, because managing agencies do not treat spring-run Chinook differently from fall-run Chinook, spring-run fish are taken legally in commercial and sport fisheries (Moyle et al. 2008). Further enhancing the problem, current management actions neglect to protect spring-run Chinook even when protections have been put in place to restrict fall-run Chinook harvest, essentially increasing pressure on the much smaller and more imperiled populations of spring-run Chinook, as took place in 2017 when fall-run Chinook harvest was closed on the Klamath River to all fishing while bag limits remained the same during the spring run period.

#### *Federal and State Regulatory Mechanisms: California Forest Practices Rules*

California Forest Practices Rules are developed under the California Forest Practices Act of 1943 which governs logging practices on all private lands. These rules are inadequate to prevent harm to Upper Klamath Chinook.

#### *Regulatory Mechanisms: Climate Change*

Current global, national, and state climate change legislation and agreements are entirely inadequate to prevent ocean acidification and the variability of other ocean conditions aggravated by climate change. As noted, these conditions pose a significant threat to the long-term survival of salmonids in their marine environment.

Greenhouse gas emissions and resulting climate change is among the least regulated threats to Upper Klamath Chinook. The primary international regulatory mechanisms addressing greenhouse gas emissions and global warming are the United Nations Framework Convention on Climate Change, the Kyoto Protocol,

and the Copenhagen Accord. While the entering into force of the Kyoto Protocol on February 16, 2005 and the development of the Copenhagen accord in December, 2009 mark significant partial steps towards the regulation of greenhouse gases, they do not and cannot adequately address the impacts of global warming that threaten the Upper Klamath Chinook.

Choices about emissions now and in the coming years will have far-reaching consequences on the magnitude of climate change impacts. The longer greenhouse gas emissions reductions are delayed, the more severe the global impacts will be (Karl et al. 2009). If global warming is going to be limited to 2°C above pre-industrial values, global emissions need to peak between 2015 and 2020 and then decline rapidly (Allison et al. 2009). This will require average annual per-capita emissions to shrink to under one metric ton CO<sub>2</sub> per capita. This is 80-95% below the per capita emissions in developed nations in 2000 (Allison et al. 2009).

There are currently no legal mechanisms regulating greenhouse gases on a national level in the United States. The immediate reduction of greenhouse gas pollution is essential to slow global warming and ultimately stabilize the climate system in order to maintain and restore Upper Klamath Chinook habitat.

For the reasons discussed, existing and proposed regulatory mechanisms are indisputably inadequate to ensure the continued survival of the Upper Klamath Chinook salmon.

## **9. SUGGESTIONS FOR FUTURE MANAGEMENT**

The steeper decline of UKTR Spring Chinook relative to fall-run UKTR Chinook stems in great part from their need to spend more time as an adult in fresh water during summer months when flows are low. Historically, the Klamath Basin offered unfettered access to higher elevation flood plain habitat and spring fed cold water refugia for adult UKTR Spring Chinook. Today, access to much of these habitats is blocked by dams, cold water springs are diverted for agricultural purposes and flood plains physically altered by mining or sedimentation associated with poor logging practices and road maintenance. Hatchery practices both at the Trinity at Iron Gate hatcheries may negatively impact genetic integrity, variability, and fitness of UKTR Spring Chinook. In addition, UKTR Spring Chinook are particularly susceptible to the warming trends associated with global warming and prolonged droughts.

In light of these facts, we suggest the following future management actions be considered:

- i. Remove the lower four Klamath River dams consistent with the terms of the Klamath Hydroelectric Settlement Agreement and PacifiCorp's pending application before FERC.
- ii. Currently, the Salmon River and South Fork Trinity sub-basins offer the largest spawning populations of the UKTR Spring Chinook in the Klamath system. These sub basins should be managed explicitly for the restoration, protection, and management of UKTR Spring Chinook.
- iii. The Shasta River should be managed as a cold-water refuge, restrictions should be placed on agricultural diversions affecting flow and temperature, ground water extraction should be limited and removal of Dwinnell dam should be considered.
- iv. The Scott River should be managed for UKTR Spring Chinook, which means restrictions should be placed on agricultural diversions affecting flow and temperature, ground water extraction should be limited, and removal of Young's Dam should be considered.
  - a. Manage the Salmon River as a UKTR Spring Chinook refuge and prioritize restoration

projects aimed to restore floodplain habitat affected by historic mining and minimizing impacts associated with logging projects and grazing. Implementation of the Salmon River Floodplain Habitat Enhancement and Mine Tailing Remediation Plan and recommended restoration projects.

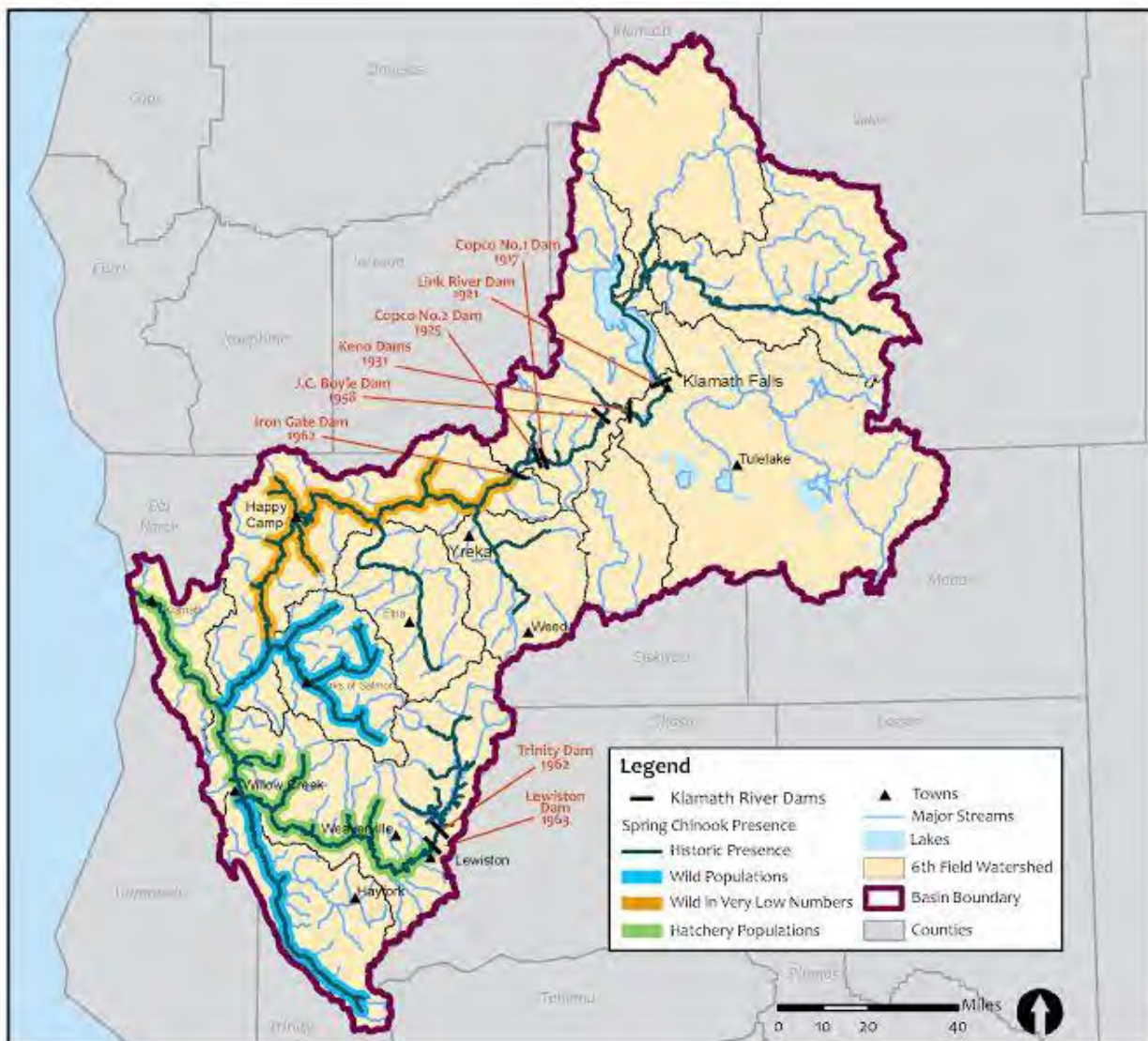
- b. Potential restoration and enhancement actions for the Salmon River include the following:
  - i. Protecting and expanding cold water refuges at summer baseflow within the mainstem channels and lower reaches of major tributaries to improve holding and summer rearing habitat conditions;
  - ii. Adding structure within simplified channel reaches (e.g., plane-bed morphology) that promotes hydraulic complexity and pool depth, increasing the amount and quality of low velocity rearing habitat, and sorting spawning gravel;
  - iii. Manipulating (e.g., grading and/or adding structure) and revegetating floodplains to improve hydrologic function and processes, primarily by increasing flow connectivity (e.g., frequency and duration of inundation) and hyporheic exchange between the winter baseflow channel (20% exceedance flow), bankfull side channels (1.5- to 2-year flow), and high flow side channels ( $\geq$ 5-year flow);
  - iv. Adding structural complexity to side channels to improve rearing habitat;
  - v. Creating, enhancing, and connecting off-channel ponds and wetlands to improve rearing habitat; and
  - vi. Grading and revegetating mine tailings on floodplains and adjacent terraces to increase riparian shading, reduce heating, and improve hyporheic exchange.
- c. Implement key actions from the collaboratively developed Salmon River In-stream Candidate Action Table and the Middle Klamath In-stream Candidate Action Table.
- v. Develop limiting factors analysis for Klamath River spring-run Chinook for the Klamath River and all tributaries within the historic range of spring-run Chinook.
- vi. Conduct assessments and develop restoration action plans to address the impacts of historic mining throughout key tributaries and the mainstem of the Klamath Basin.
- vii. Develop on comprehensive Klamath Basin spring-run Chinook recovery plan and associated restoration action plan.
- viii. Develop restoration actions and priorities for reducing the impacts of sediment inputs from roads, logging, and other activities into rivers of the Klamath-Trinity system, especially on public lands.
- ix. Prevent dewatering of habitats and limit effects of pesticides/herbicides associated with legal marijuana cultivation through permitting programs.
- x. Develop a program to investigate impact(s) of the Trinity River Hatchery on UKTR Spring Chinook populations (e.g., number of hatchery-reared fishes spawning in the wild, genetic shifts in population) and manage hatchery production accordingly. Rates of hybridization between spring-run and fall-run Chinook and relative fitness of the offspring should be paid particular attention.
- xi. Investigate whether a conservation hatchery can play a role in facilitating re-colonization of Klamath River tributaries by UKTR Spring Chinook after dam removal occurs. If such an approach is explored, efforts must be made to reduce genetic impacts of founder's effects and inbreeding/outbreeding depression.

- xii. Limit recreational in-river harvest to a mark-selected fishery for 100% adipose fin clipped Trinity River Hatchery produced spring-run Chinook to keep them separate from wild fish.
- xiii. Ban suction dredge mining in all areas deemed current or potential habitat.
- xiv. Restore headwaters and high mountain meadow systems throughout the basin and in particular in key spring-run Chinook watersheds to maximize cold water storage, lengthen cold water releases, and promote resiliency in the face of climate change.
- xv. Restore healthy fire process at a landscape scale on the Klamath Basin through increased use of prescribed fire, managed wildfire, and associated fuels treatments.
- xvi. Implement the Western Klamath Restoration Partnership Plan (Harling, Tripp, 2014)

## **10. AVAILABILITY AND SOURCES OF INFORMATION**

Please see bibliography at the end of attached NMFS petition

## 11. DETAILED DISTRIBUTION MAP



Klamath Trinity spring-run Chinook current and historic distribution map, created by SRRC from available data, 2015.

## 12. ADDITIONAL INFORMATION

### *Legal/Regulatory Background*

Recognizing that certain species of plants and animals have become extinct “as a consequence of man’s activities, untempered by adequate concern for conservation,” (Fish & G. Code § 2051 (a)) that other species are in danger of extinction, and that “[t]hese species of fish, wildlife, and plants are of ecological, educational, historical, recreational, esthetic, economic, and scientific value to the people of this state, and the conservation, protection, and enhancement of these species and their habitat is of statewide concern.”

(Fish & G. Code § 2051 (c)) the California Legislature enacted the California Endangered Species Act (CESA).

The purpose of CESA is to “conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat....” (Fish & G. Code § 2052). To this end, CESA provides for the listing of species as “threatened” and “endangered.” The Commission is the administrative body that makes all final decisions as to which species shall be listed under CESA, while the Department is the expert agency that makes recommendations as to which species warrant listing. The listing process may be set in motion in two ways: “any person” may petition the Commission to list a species, or the Department may on its own initiative put forward a species for consideration. In the case of a citizen proposal, CESA sets forth a process for listing that contains several discrete steps.

Upon receipt of a petition to list a species, a 90-day review period ensues during which the Commission refers the petition to the Department, as the relevant expert agency, to prepare a detailed report. The Department’s report must determine whether the petition, along with other relevant information possessed or received by the Department, contains sufficient information indicating that listing may be warranted. (Fish & G. Code § 2073.5).

During this period interested persons are notified of the petition and public comments are accepted by the Commission. (Fish & G. Code § 2073.3). After receipt of the Department’s report, the Commission considers the petition at a public hearing. (Fish & G. Code § 2074). At this time the Commission is charged with its first substantive decision: determining whether the Petition, together with the Department’s written report, and comments and testimony received, present sufficient information to indicate that listing of the species “may be warranted.” (Fish & G. Code § 2074.2). This standard has been interpreted by as the amount of information sufficient to “lead a reasonable person to conclude there is a substantial possibility the requested listing could occur.”<sup>1</sup> If the petition, together with the Department’s report and comments received, indicates that listing “may be warranted,” then the Commission must accept the petition and designate the species as a “candidate species.” (Fish & G. Code § 2074.2.)

Once the petition is accepted by the Commission, then a more exacting level of review commences. The Department has twelve months from the date of the petition’s acceptance to complete a full status review of the species and recommend whether such listing “is warranted.” Following receipt of the Department’s status review, the Commission holds an additional public hearing and determines whether listing of the species “is warranted.” If the Commission finds that the species is faced with extinction throughout all or a significant portion of its range, it must list the species as endangered. (Fish & G. Code § 2062.) If the Commission finds that the species is likely to become an endangered species in the foreseeable future, it must list the species as threatened. (Fish & G. Code § 2067.)

Notwithstanding these listing procedures, the Commission may adopt a regulation that adds a species to the list of threatened or endangered species at any time if the Commission finds that there is any emergency posing a significant threat to the continued existence of the species. (Fish & G. Code § 2076.5).<sup>2</sup>

Unlike ESA, CESA does not contain a definition of “species” or “subspecies” in its text, nor does it determine whether or not an Evolutionarily Significant Unit (ESU), as defined in the Federal Endangered Species Act (ESA) and detailed below, may be listed as an Endangered Species under CESA. However, in *California Forestry Assn. v. California Fish & Game Comm.*, it was determined that “the [California]

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<sup>1</sup> *Natural Resources Defense*

*Council v. California Fish and Game Comm.* 28 Cal.App.4th 1104 at 1125, 1129.

<sup>2</sup> See also *Central Coast Forest Assn. v. Fish & Game Comm.* 2 Cal. 5<sup>th</sup> 594 at 599.



legislature did not want to limit the term ‘species or subspecies’ to the federal definition. Instead the legislature likely may have wanted to leave the interpretation of that term to the Department...and to the Commission”.<sup>3</sup> Further, the decision elaborated that the Department and the Commission have a “longstanding adherence to the policy that the CESA allows listings of evolutionary significant units”.<sup>4</sup> Thus, if there is sufficient evidence to show that a subset of a species should be considered an ESU under ESA, the Commission and Department should consider a petition for listing that subset as its own Endangered Species under CESA.

The Federal Endangered Species Act defines “species” to include “any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.” 16 USC § 1533(16), *see also California State Grange v. National Marine Fish*, 620 F.Supp 2d 1111, 1121 (ED Cal 2008). The ESA does not define the term “distinct population segment.” *Grange* at 1121.

In 1991 the National Marine Fisheries Service (“NMFS”) promulgated its “*Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon*” or “ESU Policy.” (56 Fed.Reg.58612 (Nov. 20, 1991)). The ESU Policy provides that a population of Pacific salmonids is considered to be an ESU, and therefore considered for listing under the ESA, if it meets the following two criteria:

- (i.) It must be substantially reproductively isolated from other nonspecific population units; and
- (ii.) It must represent an important component in the evolutionary legacy of the species. Isolation does not have to be absolute, but it must be strong enough to permit evolutionarily important differences to accrue in different population units. The second criterion would be met if the population contributes substantially to the ecological/genetic diversity of the species as a whole (Waples 1991). *Grange* at 1123-24.

NMFS uses all available lines of evidence in applying those criteria, including specifically data from DNA analyses (“...data from protein electrophoresis or DNA analysis can be very useful because they reflect levels of gene flow that have occurred over evolutionary time scales.”), *ESU Policy*, 56 Fed. Reg. at 58518; *see also Definition of “Species” Under the Endangered Species Act: Application for Pacific Salmon*, NOAA Tech Memo NMFS F/NWC-194 (Waples 1991) at p.8 (“The existence of substantial electrophoretic or DNA differences from other conspecific populations would strongly suggest that evolutionarily important, adaptive differences also exist.”)

The ESU Policy is an interpretation by NMFS of what constitutes a “distinct population segment,” and is a “permissible agency construction of the ESA.” *Grange* at 1124, citing *Alsea Valley Alliance v. Evans*, 161 F.Supp2d 1154, 1161 (D.Or. 2001).

When considering whether a species or subspecies, including an ESU, is endangered, NMFS must consider:

- i. The present or threatened destruction, modification, or curtailment of its habitat or range;
  - ii. Overutilization for commercial, recreational, scientific, or educational purposes;
  - iii. Disease or predation;
  - iv. The inadequacy of existing regulatory mechanisms; or
  - v. Other natural or manmade factors affecting its continued existence.
- 16 U.S.C. § 1533(a)(1).

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<sup>3</sup> *California Forestry Assn. v. California Fish & Game Comm.* 156 Cal. App. 4<sup>th</sup> 1535 at 1549.

<sup>4</sup> *Ibid* at 1546.

The species shall be listed where the best available data indicates that the species is endangered because of any one, or a combination of, those five factors. 50 CFR § 424.11(c).

Any interested person may submit a written petition to list a species or subspecies as threatened or endangered. 50 CFR § 424.14(a).

The newly proposed 50 CFR §424.14(g)(1)(iii) states that petitions filed after an adverse ruling will be considered only where "new information or analysis such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted, despite the previous determination." 81 Fed. Reg. 23454-55. NMFS states further that the proposed §424.14(f) will "clarify" the Service's position that any supplemental petition will be considered with the previous petition, and they together will reset the statutory periods for response—constructively the same as filing a new petition. 80 Fed. Reg. 29289 (21 May 2015).

### *Factual Background*

Chinook salmon in the upper Klamath and Trinity Rivers are currently regulated and managed as a single ESU referred to as Upper Klamath Trinity River (UKTR) Chinook, with no distinction between seasonal runs. The Klamath Trinity spring (KTS) Chinook is not defined as its' own unique ESU, and is not listed as threatened or endangered. Water management, fisheries management, and other regulatory activities are generally conducted without consideration of potential impacts on KTS Chinook, instead considering impact to UKTR Chinook generally. This approach may be having an adverse impact on KTS Chinook especially when hatchery practices are considered

In an effort to explain differences in run timing observed in Chinook salmon populations, conservation geneticists offer two possible explanations for the evolution of spring, or "premature," migration patterns for salmonids: a monophyletic pattern of evolutionary history versus a polyphyletic pattern of evolutionary history. These models are based on a comparison of the DNA structure of fall and spring run individuals within the same watershed versus nearby watersheds using a variety of genetic techniques.

In evaluating whether to list seasonal runs as Evolutionarily Significant Units ("ESU") for purposes of the Endangered Species Act, the National Marine Fisheries Service ("NMFS") considers which of these two evolutionary models apply to the given population. Because spring and fall run fish fitting the polyphyletic pattern evolve from a common ancestor based on environmental factors, the genetic material for both seasonal runs are contained in fish from both runs. The evolutionary changes necessary to give rise to the phenotype are relatively easy to reproduce since, according to this model, it has happened many times in closely related populations. NMFS has argued that even if spring run migrating subpopulations were extirpated by flow diversions, barriers, or other factors, the spring migration phenotype could easily re-emerge if appropriate habitat was later restored. On that basis, polyphyletic pattern fish runs typically do not meet NMFS guidance requirement to qualify as an ESU. According to Waples, *"Although the failure of most stock transfers indicates that local populations may be largely irreplaceable on human time frames, at least some patterns of Chinook salmon life history diversity appear to be evolutionarily replaceable, perhaps over time frames of a century or so. The evidence for repeated parallel evolution of run timing in Chinook salmon indicates that such a process is likely, provided that habitats capable of supporting alternative life-history trajectories are present and sufficient, robust source populations are maintained"* (Waples et al. 2004).

In contrast, seasonal fish runs that evolved via the monophyletic pattern evolved from a separate ancestor, and are genetically distinct from other fish runs in that river system. Thus if extirpated, monophyletic seasonal fish runs are likely gone forever, and thus warrant classification as an ESU, as well as the protections that result from such a listing.

Until now, most conservation geneticists considered most spring run Chinook populations to fit the polyphyletic model. This would mean that fish from a common ancestor evolve genetic differences due to the reproductive isolation and natural selection driven by the unique features of their respective watersheds. According to this explanation, these separate populations later evolved the early migration or 'spring run' phenotype independently from each other. In other words, the spring run phenotype evolved many times over in neighboring populations. The application of the polyphyletic model to these populations stems from studies that show that the genetic structures of spring and fall run individuals within a watershed are more genetically similar than spring run individuals from different watersheds. Examples of runs thought to be a product of this process include spring and fall run Chinook in the Rogue and Umpqua (Waples et al. 2004).

However, in some fish populations the DNA structure of fall and spring run individuals within the same watershed are less similar to one another than those in neighboring watersheds. These observations suggest an alternative explanation for the evolutionary basis for the early migration phenotype. In these cases, the difference in run timing is attributed to a monophyletic pattern of evolutionary history. Under this model the genetic changes that give rise to differences in run timing predate the genetic differences that arise as a consequence of geographic isolation. Until now, the only known examples of monophyletic based premature migration are among spring run and fall run Chinook salmon in the mid and interior Columbia and Snake River basins, and winter, spring and fall run Chinook populations in California's Central Valley. The fish in each of these seasonal runs are more closely related to each other than to Chinook salmon in any other basin, or to other Chinook salmon runs in the same tributary river (Meyers et al 1998; Banks et al 2000a; Garza et al 2007). Some researchers argue that the differences observed in the Central Valley spring and fall populations stem more from anthropogenic factors associated with hatchery management than with a true evolutionarily event.

In summary, conservation biologists consider most populations of spring Chinook salmon to be a product of polyphyletic evolution, except in a few rare exceptions where it is not.

In a memo summarizing the finding of the Biological Review Team (BRT) report on the 2011 Petition, the Science Director of the National Marine Fisheries Service Southwest Fisheries Science Center, Francisco Werner, noted that "One reviewer expressed the personal view that there is evidence for reproductive isolation and adaptive divergence between Klamath River spring-run and fall-run Chinook salmon and thus merit their own ESU. However, the reviewer found that spring-run Chinook salmon in the UKTR basin do not represent a unique component of the evolutionary legacy of the species, and therefore, do not meet one of the two requirements for recognition as an ESU under NMFS' ESU policy (the other requirement being long-term reproductive isolation resulting from an unique evolutionary event that is unlikely to re-evolve over ecological time-scales)"(Werner 2011). However, recently published work challenges the assertion that spring run Chinook does not meet the other requirement. The study shows that a unique evolutionary event was the cause for the spatial and temporal reproductive isolation that spring and fall run exhibit in the UKTR, and shows that spring run life type Chinook are unlikely to re-evolve over ecological time scales (Prince et al. 2017).

#### *2011 Petition for Listing UKTR Chinook*

In 2011, Center for Biological Diversity (CBD) et al. filed an Endangered Species Act (ESA) listing petition ("2011 Petition") with NMFS to address the dramatic declines of Klamath River spring Chinook salmon. CBD *et al.* suggested 3 alternatives for NMFS to consider: 1) list spring run Chinook as their own evolutionary significant unit (ESU); 2) list spring run Chinook as a distinct population segment (DPS) within the previously recognized UKTR Chinook ESU; or 3) list the entirety of the UKTR Chinook ESU (Center for Biological Diversity et al. 2011).

In its initial response to the 2011 Petition, the NMFS Southwest Region (SWR) determined that "... the literature cited in the petition, and other literature and information available in our files, we found that the petition met the criteria in our implementing regulations at 50 CFR 424.14(b)(2) that are applicable to our 90-day review and determined that the petition presented substantial information indicating that the petitioned action may be warranted the petition presented substantial new scientific information thereby indicating that the petitioned actions may be warranted" (National Marine Fisheries Service 2011) (76 FR 20302; April 12, 2011).

In that 90-day finding, NMFS narrowed the scope of their pending further review. In particular, the agency explained that it would not consider Petitioners' second alternative for listing Chinook salmon in the UKTR ESU as a DPS. Instead, NMFS determined that the analysis would consider whether the KTS Chinook constitutes an ESU. NMFS noted that their Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon, "...explains that a Pacific salmon stock will be considered a distinct population segment, and hence a "species" under the ESA, if it represents an ESU of the biological species" (ESU Policy; 56 FR 68612; November 20, 1991).

#### *2011 Biological Review Team Determination*

After determining that the petition actions met the appropriate criteria and may be warranted, NMFS convened a Biological Review Team (BRT) which considered the 2011 Petition and over 50 written comments from the public. Specifically, the BRT considered two fundamental issues: 1) the extent to which the new information supports the current UKTR Chinook Salmon ESU delineation, or the separation of spring-run and fall-run Chinook salmon into separate ESUs, and 2) assessment of the biological status of the supported ESU configuration using the viable salmonids population framework (Williams et al. 2011).

In the 2011 Petition, CBD et al. argued that the KTS Chinook evolved via the monophyletic pattern, and thus qualified for listings as an ESU. CBD pointed to new genetic data, and argued that KTS Chinook show genetic and life history divergence from fall run UKTR Chinook equal or greater than those of the Central Valley spring and fall run Chinook ESUs.

The BRT reviewed the new genetic data brought forth by CBD et al. The BRT did not agree based on the data that a monophyletic evolutionary model best described the prevalence of the KTS Chinook. Rather, the BRT argued that a polyphyletic evolutionary history best explained the 'premature' migration pattern observed within the UKTR Chinook ESU. While acknowledging some genetic differences between various UKTR Chinook runs, the BRT concluded that the genetic and life history differences of the KTS Chinook were not great enough to warrant the designation of ESU status. The BRT stated,

*"The BRT concluded that the new information supports the ESU delineation of Myers et al. (1998) in which UKTR spring-run and fall-run Chinook salmon populations constitute a single ESU, and that the expression of the spring-run life-history variant is polyphyletic in origin in all of the populations for which data are available."*

The BRT went on to conclude that considered as a whole population, UKTR Chinook were not threatened or endangered, stating:

*"As to the status of the UKTR Chinook Salmon ESU, the BRT found that the ESU is currently at low risk of extinction within the next 100 years"(ibid.)*

The results and conclusions of the BRT report was the basis of the 12 month finding published in the Federal Register on April 2, 2012 which rejected the 2011 Petition of CBD et al. to list KTS Chinook salmon (National Marine Fisheries Service 2011).

### *Recent Technology, Data and Analysis*

NMFS' 2011 conclusion was consistent with the large body of literature based on genetic analyses performed using microsatellites. While these studies often revealed genetic differences between geographically isolated populations, they failed to consistently demonstrate significant differentiation between premature and mature migrating phenotypes within a watershed (Kinziger et al. 2013; Waples 1991; Nielsen, Crow, and Fountain 1999). As a consequence, early migration phenotypes, including the KTS Chinook, have been largely grouped into the same ESU or DPS as mature migration phenotypes.

Until recent advances in genetic analysis, researchers were limited by the available technology in how they could study the genetic differences between closely related populations. Previously, researchers looked for relatively large differences in genetic structure, which often appear in genomic regions not influenced by environmental pressures and natural selection, because the available technology allowed this sort of analysis. These genomic regions vary due to gene flow and genetic drift, as opposed to being driven by environmental pressures and natural selection. The weakness of this approach is that it lacks the molecular resolution necessary to detect evolutionarily significant adaptations that may stem from changes in sequence and structure in specific genomic regions, particularly in regions that encode genes.

Although the relatively large body of data is indeed consistent with the hypothesis that polyphyletic evolution explains premature run timing (at least in most cases), the evidence is also consistent with another explanation – that premature run timing is the result of changes in genetic sequence or structure of specific regions of the genome that predates the polyphyletic changes brought on by geographic isolation. Until recently conservation geneticists lacked the tools necessary to fully explore the latter hypothesis. However, recent advances in technology now allow researchers to comb through genomes at a much higher resolution cheaply and quickly. Previously, researchers would rely on dozens or maybe hundreds of molecular markers to search for genetic differences between subpopulations. Today, researchers can quickly compare millions of genetic regions to look for differences.

Based on the technical limitations of genetic analysis, the previous approach to determining the evolutionary history of the premature migration phenotype was inferential. In other words, conservation geneticists inferred the evolutionary history of the phenotype based on demography not adaptation. The new technology now allows researchers to locate individual genomic regions that are the actual cause of evolutionary change, and reconstruct the evolutionary history of these regions directly. This direct reconstruction of the evolutionary history of the spring run Chinook versus fall run Chinook has now been performed and recently published in a peer reviewed journal (Prince et al. 2017).

Prince et al. created a high-resolution genomic library from samples of spring and fall migrating adult Chinook and steelhead from several Pacific Northwest watersheds, including the Klamath. The researchers then created high-resolution restriction-site associated DNA (RAD) libraries, sequenced them, and aligned the sequences to a recent salmonid genome draft. The genomic libraries generated from individual fish were then compared using a probabilistic framework to discover small nuclear polymorphisms (SNPs). Although Prince et al. notes that the initial analysis was consistent with current DPS and ESU delineations, the sheer volume of genomic positions they went on to compare (nearly 10 million) allowed a thorough comparison of premature and mature migrating individuals. This revealed several SNPs within a couple hundred thousand base pairs of one another. Further analysis revealed this region to be within the GREB1L gene. This result was then repeated in other populations including UKTR Chinook. Prince et al. notes that this finding makes biological sense in that this gene is implicated in foraging and fat storage in mammals. In salmon, premature migrating Chinook have a significantly higher fat content than mature migrating individuals, consistent with the fact that early migrating individuals are destined to climb higher into watersheds before spawning and thus need more stored energy.

Prince et al. went on to sequence the GREB1L region in all of their samples and created a gene tree based on parsimony. The tree revealed two monophyletic groups corresponding to migration phenotype. All samples, regardless of watershed of origin, separated into the appropriate migratory clade. In other words, Prince et al. found that all premature migrating individuals evaluated grouped together in the same monophyletic group. Thus, genetic differences in this single gene explain the difference between premature and mature migrating phenotypes. Although NMFS has argued that “some patterns of Chinook salmon life history diversity appear to be evolutionarily replaceable, perhaps over time frames of a century or so...” (Waples et al. 2004), premature migration clearly does not fall into this category as explained in greater detail below.

Without the advent of molecular tools that allow for the cheap and quick creation of detailed DNA libraries (collectively referred to as Next Generation Sequencing or NGS), the identification of a single gene that is responsible for such a complex phenotype would have been nearly impossible. Now that the technology is available and has been applied, however, the monophyletic nature and evolutionary significance of UKTR Spring Chinook must be acknowledged.

### *UKTR Spring Chinook*

Myers et al. (1998) recommended that their determination, that spring-run and fall-run Chinook salmon populations in the UKTR ESU constitute a single ESU, should be revisited if substantial new genetic information from natural spring-run populations were to become available (Williams et al. 2011). This Petition presents precisely that genetic information for the upper Klamath Trinity River system Chinook populations. For spring run and fall run populations of Chinook salmon to be considered separate ESUs, as defined by Waples (1991) and later elaborated on by Waples (1995), it must be shown that these populations are substantially reproductively isolated from other conspecific population units and that they represent an important component in the evolutionary legacy of the species. Prince et al. makes that demonstration.

It is well established that spring Chinook, by virtue of entering fresh water rivers during snow melt, reach spawning areas that are, generally, reproductively isolated from their fall run counterparts (Quinn 2005). Waples' concept of evolutionary legacy implies that there would need to be a monophyletic pattern of the evolutionary history of the two run-types within the UKTR. For spring run Chinook, Prince et al. demonstrate that the molecular basis for the spring run phenotype is associated with a defined allele that evolved long ago in Chinook evolutionary history. Prince et al. found evidence of only two allelic evolutionary events that produced a premature migration allele, one in Chinook and one in steelhead, even though the species diverged approximately 15 million years ago. This is in contrast to the assertion by the BRT review of the previous KTS Chinook petition which concluded, without the benefit of Prince et al.'s recent findings, that the spring run phenotype is polyphyletic in origin and evolved independently in many locations.

Prince's recently published data clearly demonstrate that contrary to prevailing dogma, Klamath-Trinity spring Chinook exhibit a monophyletic pattern of evolutionary history, and meet Waples' and NMFS' criteria for a separate ESU.

A more recent publication (Thompson et al. 2018) further strengthens this argument and calls into question any assertion that Klamath spring-run Chinook will reemerge from Chinook heterozygotes once the spring-run phenotype is lost:

“using a new marker identified through a high-resolution, multi-population analysis of GREB1L suggests that 1) the association of migration type with variation at GREB1L is extremely robust and 2) heterozygotes have an intermediate migration phenotype.



Therefore, while phenotypic variation within each genotype (e.g., precise freshwater entry and spawning dates) is yet to be explained, migration type (i.e., premature/spring-run or mature/fall-run) appears to have a strikingly simple genetic architecture. Furthermore, the association of a single haplotype with the spring-run phenotype in diverse locations supports a previous conclusion that spring-run alleles arose from a single evolutionary event and cannot be expected to readily re-evolve (Prince et al., 2017; Miller et al., 2012). Thus, simple modes of inheritance and rare allelic evolutionary events can underpin complex phenotypic variation.”

Citing evidence that heterozygotes are selected against, Thompson et al. conclude that that, “where the spring-run phenotype is lost, spring-run alleles should not be expected to be maintained in the heterozygous state... both theory and empirical evidence suggest heterozygotes are not a sustainable reservoir for spring-run alleles, and human factors can eliminate important adaptive variation regardless of total population size.”

As previously noted, the criteria for an ESU designation are that 1) it must be substantially reproductively isolated from other nonspecific population units; and 2) it must represent an important component in the evolutionary legacy of the species.

Prince et al. 2017 demonstrates that KTS Chinook are an important component in the evolutionary legacy of UKTR Chinook and that the reproductive isolation between spring and fall run populations is strong enough to permit evolutionarily important differences to accrue. Thompson et al. 2018 further demonstrate the point.

## Bibliography

- Allen, M.A., and T.J. Hassler. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest)—Chinook salmon. U.S. Fish & Wildlife Service Biological Report 82(11.49). U.S. Army Corps of Engineers, TR EL-82-4. 26 pp.
- Allison, I., N.L. Bindoff, R.A. Bindshadler, P.M. Cox, N. de Noblet, M.H. England, J.E. Francis, N. Gruber, A.M. Haywood, D.J. Karoly, G. Kaser, C. Le Quere, T.M. Lenton, M.E. Mann, B.I. McNeil, A.J. Pitman, S. Rahmstorf, E. Rignot, H.J. Shellnuber, S.H. Schneider, S.C. Sherwood, R.C.J. Somerville, K. Steffen, E.J. Steig, M. Visbeck, and A.J. Weaver. 2009. The Copenhagen Diagnosis, 2009: Updating the World on the Latest Climate Science. The University of New South Wales Climate Change Research Center (CCRC), Sydney, Australia.
- Alpers, C.N., M.P. Hunerlach, J.T. May, and R.L. Hothem. 2005. Mercury Contamination from Historical Gold Mining in California. U.S. Geological Survey Fact Sheet FS-061-00. [Online] Available: [http://walrus.wr.usgs.gov/infobank/programs/html/factsheets/pdfs/2005\\_3014.pdf](http://walrus.wr.usgs.gov/infobank/programs/html/factsheets/pdfs/2005_3014.pdf) [accessed 15 Jul 2010].
- Anderson, D.M., P.M. Glibert, and J.M. Burkholder. 2002. Harmful Algal Blooms and Eutrophication: Nutrient Sources, Composition, and Consequences. *Estuaries* 25(4b): 704–726. [Online] Available: [http://www.whoi.edu/cms/files/Anderson\\_etal\\_2002\\_Estuaries\\_29903.pdf](http://www.whoi.edu/cms/files/Anderson_etal_2002_Estuaries_29903.pdf) [accessed 15 Jul 2010].
- Baker, P.F., T.P. Speed, and F.K. Ligon. 1995. Estimating the influence of temperature on the survival of chinook salmon smolts (*Oncorhynchus tshawytscha*) migrating through the Sacramento-San Joaquin River Delta of California. *Can. J. Fish. Aquat. Sci.* 52(4):855–863.
- Banks, M. and M. Bartron. 1999. Microsatellite DNA variation among Klamath River Chinook salmon sampled from fall and spring runs. Yurok Tribe Fisheries Program. Klamath, CA. 15 pp.
- Barnhart, R.A. 1994. Salmon and steelhead populations of the Klamath-Trinity Basin, California. Pp. 73-97 in Klamath Basin Fisheries Symposium: Proceedings of a Symposium held in Eureka, California, 23-24 March 1994, T.J. Hassler, ed. Arcata, CA: California Cooperative Fishery Research Unit, Humboldt State University.
- Barr, B.R., M.E. Koopman, C.D. Williams, S.J. Vynne, R. Hamilton, and B. Doppelt. 2010 Preparing for Climate Change in the Klamath River Basin. National Center for Conservation Science and Policy and The Climate Leadership Initiative. University of Oregon. 37 pp.
- Bartholomew, J.L., S.D. Atkinson, S.L. Hallett, C.M. Zielinski, and J.S. Foott. 2007. Distribution and abundance of the salmonid parasite *Parvicapsula minibicornis* (Myxozoa) in the Klamath River basin (Oregon-California, U.S.A.). *Dis. Aquat. Organ.* 78(2):137-46.
- Bartholow, J.M., 2000. Estimating cumulative effects of clearcutting on stream temperatures, *Rivers*, 7(4): 284-297. [Online] Available: [http://smig.usgs.gov/SMIG/features\\_0902/clearcut.html](http://smig.usgs.gov/SMIG/features_0902/clearcut.html) [accessed 15 Jul 2010].
- Bash, J., C. Berman, and S. Bolton. 200. Effects of Turbidity and Suspended Solids on Salmonids. Center for Streamside Studies. University of Washington. 74 pp.
- Belsky, A.J., A. Matzke, and S. Uselman. 1999. Survey of Livestock Influences on Stream and Riparian Ecosystems in the Western United States. *Journal of Soil and Water Conservation*, 54: 419-431. [Online] Available: <http://www.sou.edu/biology/courses/Bi523/BelskyGrazing.pdf> [accessed 15 Jul 2010].
- Bilby, R.E., P.A. Bisoon, C.C. Coutant, D. Goodman, S. Hanna, N. Huntly, E.J. Loudenslager, L. McDonald, D.P. Philipp, B. Riddel, J. Olsen, R. Williams. 2005. Viability of ESUs Containing Multiple Types of Populations. ISAB (Independent Scientific Advisory Board for the Northwest Power and Conservation Council, Columbia River Basin Indian Tribes, and NOAA Fisheries. Portland, OR. 38 pp.
- Bjork, S.J., 2010. Factors Affecting the *Ceratomyxa shasta* Infectious Cycle and Transmission between Polychaete and Salmonid Hosts. PhD Dissertation. Oregon State University.
- Bjork, S.J., and J.L. Bartholomew. 2009. The effects of water velocity on the *Ceratomyxa shasta* infectious cycle. *Journal of Fish Diseases*, 32:131-142.

- Botkin, Daniel, K. Cummins, T. Dunne, H. Reiger, M. Sobel, and L. Talbot. 1995. Status and future of salmon in Western Oregon and Northern California. The Center for the Study of the Environment. Report #8. May, 1995.
- Brodeur, R.D., Fisher, J.R., Teel, D.J., Emmett, R.K., Casillas, E. and Miller, T.W. 2004. Juvenile salmon distribution, growth, condition, origin, and environmental and species associations in the Northern California Current, Fisheries Bulletin, 102, 25-46.
- Brown, R.F. and B.R. Mate. 1983. Abundance, movements and feeding habits of harbor seals, *Phoca vitulina*, at Netarts and Tillamook Bays, Oregon. NOAA Fishery Bull. 81(2): 291-301.
- Campbell, E.A., and P.B. Moyle. 1991. Historical and recent population sizes of spring run Chinook salmon in California. Pp. 155-216 in Proceedings of the 1990 Northeast Pacific Chinook and Coho Salmon Workshop: Humboldt State University, Arcata, CA, September 18-22, 1990, T.J. Hassler, editor. Arcata, CA: California Cooperative Fishery Research Unit, Humboldt State University.
- CDFG (California Department of Fish and Game). 1965. California Fish and Wildlife Plan. State of California, The Resources Agency, Department of Fish and Game. Vol. 1-3B.
- CDFG (California Department of Fish and Game). 1979a. Salmon River Waterway Management Plan. Sacramento, CA: California Department of Fish and Game. 92 pp.
- CDFG (California Department of Fish and Game). 1990. Status and management of spring run Chinook salmon. Report by Inland Fisheries Division, May 1990. 33 pp.
- CDFG (California Department of Fish and Game). 2004. September 2002 Klamath River Fish-Kill: Final Analysis of Contributing Factors and Impacts. California Department of Fish and Game Northern California-North Coast Region, The Resources Agency, State of California. 183 pp.
- CDFG (California Department of Fish and Game). 2006. Annual report. Trinity River Basin salmon and steelhead monitoring project, 2004-2005 season. Department of Fish and Game.
- CDFG (California Department of Fish and Game). 2007 "DFG Announces Salmon, Steelhead Restoration Plans for Battle Creek." Press release. 15 Mar 2007. [Online] Available: <http://www.dfg.ca.gov/news/news07/07027.html>. [accessed 12 Aug 2010].
- CDFG (California Department of Fish and Game). 2009. Literature Review on the Impacts of Suction Dredge Mining in California. Project No. 09.005. [Online] Available: <http://www.dfg.ca.gov/suctiondredge/docs/SuctionDredgeLiteratureReview.pdf> [accessed 15 Jul 2010].
- CDFW (California Department of Fish and Wildlife). 2016. Klamath River Spring Chinook Mega Table (collaborative data maintained by California Department of Fish and Wildlife). [Online] Available: [http://srrc.org/publications/programs/fisheries/1980%20-%202015%20MEGA-TABLE\\_Spring-Chinook.pdf](http://srrc.org/publications/programs/fisheries/1980%20-%202015%20MEGA-TABLE_Spring-Chinook.pdf). [Accessed 26 Feb 2018].
- CDFW (California Department of Fish and Wildlife). 2017. 2017 Klamath River Basin Regulations.pdf, Important Notice: 2017 Klamath River Fall-Run Chinook Salmon Closure. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=147891> [Accessed 26 Feb 2018]
- Chandler, T. 2009. Why exactly are the Scott & Shasta Rivers being dewatered-And why isn't CA Fish & Game doing anything about it? The Trout Underground. [Online] Available: <http://troutunderground.com/2009/08/17/why-exactly-are-the-scott-shasta-rivers-being-dewatered-and-why-isnt-ca-fish-game-doing-anything-about-it/> [accessed 15 Jul 2010].
- CRWQCB (California Regional Water Quality Control Board). 1993. Investigation of Water Quality Conditions in the Shasta River, Siskiyou County. Interim report. [Online] Available: <http://www.snowcrest.net/shastacrm/biblio/shasta/gwynne/GWYNNE.DOC> [accessed 15 Jul 2010].
- Center for Biological Diversity, Oregon Wild, Environmental Protection Information Center, and The Larch Company. 2011. "Petition to List Upper Klamath Chinook Salmon (*Oncorhynchus tshawytscha*) as a Threatened or Endangered Species," January 27, 2011.
- Cole, T.M., and H.H. Hannan. 1990. Dissolved Oxygen Dynamics in Reservoir Limnology: Ecological Perspectives. John Wiley & Sons, New York, 1990. p 71-107.
- Coots, M. 1967. Angler's Guide to the Klamath River. Calif. Fish Game.

- Cordone, A.J., and D.W. Kelley. 1961. The influences of inorganic sediment on the aquatic life of streams. *California Fish and Game* 47(2):189-228.
- Correll, D.L. 1998. The Role of Phosphorus in the Eutrophication of Receiving Waters: A Review. *J. Environ. Qual.* 27: 261-266. [Online] Available: <http://espm.berkeley.edu/classes/espm-120/Website/correll1998.pdf> [accessed 15 Jul 2010].
- De la Fuente, J. and P. A. Haessig, 1993, Salmon Sub-Basin Sediment Analysis, USDA – Forest Service, Klamath National Forest.
- Dietrich, W.E., and R. Real de Asua. 1998. A validation study of the shallow slope stability model, SHALSTAB, in forested lands of Northern California. *Stillwater Ecosystem, Watershed & Riverine Sciences*. Berkeley, CA. 59 pp. [Online] Available: [http://www.krisweb.com/biblio/gen\\_ucb\\_dietrichetal\\_1998\\_shalstab.pdf](http://www.krisweb.com/biblio/gen_ucb_dietrichetal_1998_shalstab.pdf) [accessed 15 Jul 2010].
- Dileanis, P.D., S.E. Schwarzbach, and J. Bennett. 1996. Detailed Study of Water Quality, Bottom Sediment, and Biota Associated with Irrigation Drainage in the Klamath Basin, California and Oregon, 1990-92: U.S. Geological Survey Water-Resources Investigations Report 95-4232, 68 p. [Online] Available: [http://www.krisweb.com/biblio/klamath\\_usgs\\_dileanisetal\\_1996.pdf](http://www.krisweb.com/biblio/klamath_usgs_dileanisetal_1996.pdf) [accessed 15 Jul 2010].
- Donato, D.C., J.B. Fontaine, J.L. Campbell, W.D. Robinson, J.B. Kauffman, and B.E. Law. 2006. Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk. *Science*. 311(5759): 352. [Online] Available: <http://www.cnr.vt.edu/for2514/News/DonatoScience.pdf> [accessed 15 Jul 2010].
- Doremus, H., A.D. Tarlock 2003. Fish, Farms, and the Clash of Cultures in the Klamath Basin. *Ecology Law Quarterly*. 30(279).
- Elder, D., B. Olson, A. Olson, J. Villepontoux, and P. Brucker. 2002. Salmon River Subbasin Restoration Strategy: Steps to Recovery and Conservation of Aquatic Resources. Prepared for The Klamath River Basin Fisheries Restoration Task Force, Yreka Fish and Wildlife Office, Yreka, CA. 53pp. [Online] Available: <http://srrc.org/publications/general/SRRC%20Salmon%20River%20Subbasin%20Restoration%20Strategy.pdf> [accessed 26 Feb 2018].
- EPA (United States Environmental Protection Agency). 2003. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. Seattle, WA. 57 pp. [Online] Available: [http://yosemite.epa.gov/R10/water.nsf/6cb1a1df2c49e4968825688200712cb7/b3f932e58e2f3b9488256d16007d3bca/\\$FILE/TempGuidanceEPAFinal.pdf](http://yosemite.epa.gov/R10/water.nsf/6cb1a1df2c49e4968825688200712cb7/b3f932e58e2f3b9488256d16007d3bca/$FILE/TempGuidanceEPAFinal.pdf) [accessed 15 Jul 2010].
- EPA (United States Environmental Protection Agency). 2008. Memo to SWRCB Exec. Director Dorothy Rice from Alexis Strauss re: withdrawal of approval not to list Klamath River for microcystin toxin. March 13, 2008. U.S. EPA Region IX, San Francisco, CA. 14 p. with Staff Report. [Online] Available: [http://www.klamathwaterquality.com/documents/EPA\\_Microcystis\\_Listing\\_Reconsider.pdf](http://www.klamathwaterquality.com/documents/EPA_Microcystis_Listing_Reconsider.pdf) [accessed 15 Jul 2010].
- Engstrom, R.T. 2010. First-Order Fire Effects on Animals: Review and Recommendations. *Fire Ecology* 6(1): 115-130. [Online] Available: [fireecology.net/Journal/pdf/volume06/Issue01/115.pdf](http://fireecology.net/Journal/pdf/volume06/Issue01/115.pdf) [accessed 15 Jul 2010].
- Evenson, D.F. 2001. Egg pocket depth and particle size composition within Chinook salmon redds in the Trinity River, California. Arcata, CA, Humboldt State University.
- Feely, R.A., C.L. Sabine, J.M. Hernandez-Ayon, D. Janson, B. Hales. 2008. Evidence for Upwelling of Corrosive “Acidified” Water onto the Continental Shelf. *Science*. 320(1490). American Association for the Advancement of Science. Washington DC.
- Findlay, S. 1995. Importance of surface-subsurface exchange in stream ecosystems: The hyporheic zone, *Limnol. Oceanogr.*, 40: 159–164. [Online] Available: [http://www.aslo.org/lo/toc/vol\\_40/issue\\_1/0159.pdf](http://www.aslo.org/lo/toc/vol_40/issue_1/0159.pdf) [accessed 15 Jul 2010].
- Flint, L.E., Flint, A.L., Curry, D.S., Rounds, S.A., and Doyle, M.C., 2005, Water-Quality Data from 2002 to 2003 and Analysis of Data Gaps for Development of Total Maximum Daily Loads in the Lower Klamath River Basin, California: U.S. Geological Survey Scientific Investigations Report 2004-5255, 77 p. [Online] Available:

- [http://www.swrcb.ca.gov/northcoast/water\\_issues/programs/tmdls/shasta\\_river/pdf/sir\\_2004-5255.pdf](http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdls/shasta_river/pdf/sir_2004-5255.pdf) [accessed 14 Jun 2010].
- Foott J.S., R. Harmon, and R. Stone. 2003. FY2002 Investigational report: Ceratomyxosis resistance in juvenile chinook salmon and steelhead from the Klamath River. U.S. Fish & Wildlife Service California – Nevada Fish Health Center, Anderson, CA.
- Foster, D. 2002. Refuges and Reclamation: Conflicts in the Klamath Basin 1904-1964. *Oregon Historical Quarterly*. 103(2):150-187.
- Francis, R.C. and T.H. Sibley. 1991. Climate change and fisheries: what are the real issues? *NW Environment Journal* 7:295-307.
- Garza, J. C., S. M. Blankenship, C. Lemaire, and G. Charrier. 2007. Genetic population structure of Chinook salmon (*Oncorhynchus tshawytscha*) in California's Central Valley. Final report: CalFed Project eaire, ensive evaluation of population structure and diversity for Central Valley Chinook salmona. Available on-line at: <http://www.yubaaccordrmt.com/Studies%20%20Reports/CVChinDraftFinalReport-Garza.pdf>
- Goodman, D. 2004. Salmon supplementation: demography, evolution, and risk assessment. Pages 217-232 in M. J. Nickum, P. M. Mazik, J. G. Nickum, and D. D. MacKinlay, editors. *Propagated fish in resource management*. American Fisheries Society, Symposium 44, American Fisheries Society, Bethesda, Maryland.
- Goodman, D. 2005. Selection equilibrium for hatchery and wild spawning fitness in integrated breeding programs. *Canadian Journal of Fisheries and Aquatic Sciences*. 62(2): 374-389.
- Graybill, M.R. 1981. Haul out patterns and diet of harbor seals, *Phoca vitulina*, in Coos County, Oregon. Master's Thesis. Univ. of Oregon. 55p.
- Guillen, G. 2003. Klamath River Fish Die-off September 2002: Causative Factors of Mortality. U.S. Fish & Wildlife Service, Arcata Fish and Wildlife Office. Arcata, CA.
- Hallock, R.J., Elwell, R.T. & Fry, D.H. 1970. Migrations of adult king salmon (*Oncorhynchus tshawytscha*) in the San Joaquin Delta, as demonstrated by the use of sonic tags. *Calif. Depart. Fish Game Fish. Bull.* 15.
- Hamilton, J.B., G.L. Curtis, S.M. Snedaker, and D.K. White. 2005. Distribution of anadromous fishes in the Upper Klamath River watershed prior to hydropower dams-a synthesis of the historical evidence. *Fisheries*, 30:10-20.
- Hanson, L.C. 1993. The foraging ecology of Harbor Seals, *Phoca vitulina*, and California Sea Lions, *Zalophus californianus*, at the mouth of the Russian River, California. M.S. Thesis, Sonoma State University, California. 70p.
- Harling, W., B. Tripp. 2014. Western Klamath Restoration Partnership - A Plan for Restoring Fire Adapted Landscapes. WKRP. <https://www.wkrp.network/publications/> [Accessed 14 June, 2018]
- Harvey, B.C. and T.E. Lisle, 1998. Effects of suction dredging on streams: a review and and evaluation strategy. *Fisheries* 23(6):8-17. [Online] Available: [http://www.karuk.us/press/mining\\_pdfs/HarveyLisle%20Suction%20Dredging%20effects.pdf](http://www.karuk.us/press/mining_pdfs/HarveyLisle%20Suction%20Dredging%20effects.pdf) [accessed 15 Jul 2010].
- Harvey, B.C. and T.E. Lisle, 1999. Scour of Chinook Salmon Redds on Suction Dredge Tailings. *North American Journal of Fisheries Management* 19: 613-617. [Online] Available: [http://www.krisweb.com/biblio/gen\\_afs\\_harveyetal\\_1999.pdf](http://www.krisweb.com/biblio/gen_afs_harveyetal_1999.pdf) [accessed 15 Jul 2010].
- Hawthorne, N. 2017. Estimating hydraulic mining disturbance to the Salmon River using LiDAR. Prepared in fulfillment of the Humboldt State University course in Geospatial Science in Research. December
- Healey, M.C. 1991. Life history of Chinook salmon. pp. 311-349 In: C. Groot and L. Margolis (eds.) Pacific Salmon Life Histories. University of British Columbia Press. Vancouver, BC, Canada.
- Hecht, B., and G.R. Kamman, Initial Assessment of Pre- and Post Klamath Project Hydrology on the Klamath River and Impacts of the Project on Instream Flows and Fishery Habitat 1996. *Balance Hydrologics*. 15-21. [Online] Available: <http://www.balancehydro.com/pdf/9506Klamath.pdf> [accessed 10 Jun 2010].

- Henley, W.F., M.A. Patterson, R.A. Neves, D.A. Lemley. 2000. Effects of Sedimentation and Turbidity on Lotic Food Webs: A Concise Review for Natural Resource Managers. *Reviews in Fisheries Science* 8(2): 125-139. [Online] Available: [http://www.fws.gov/northeast/virginiafield/pdf/PARTNERS/lake\\_tecumseh/EffectsofSedimentHenley\\_2000.pdf](http://www.fws.gov/northeast/virginiafield/pdf/PARTNERS/lake_tecumseh/EffectsofSedimentHenley_2000.pdf) [accessed 15 Jul 2010].
- Higgins, P., S. Dobush, D. Fuller. 1992. Factors in Northern California Threatening Stocks with Extinction. Humboldt Chapter of the American Fisheries Society. Arcata, CA. 27 pp.
- Hillemeier, Dave, Michael Belchik, Toz Soto, S. Craig Tucker, and Sean Ledwin. 2017. "Measures to Reduce Ceratonva Shasta Infection of Klamath River Salmonids: A Guidance Document." Yurok Tribe, Yurok Tribe, Karuk Tribe, Hoopa Valley Tribe.
- Hinke, J.T., Foley, D.G., Wilson, C. and Watters, G.M. 2005. Persistent habitat use by Chinook salmon *Oncorhynchus tshawytscha* in the coastal ocean. *Marine Ecology Progress Series*, 304, 207-220.
- Hiser, C. 1985. Annual Report: Iron Gate salmon and steelhead hatchery 1982-83. Inland Fisheries Administrative Report No. 85-02. 23 pp.
- Hoffman, R., and J. Dunham. 2007. Fish Movement Ecology in High Gradient Headwater Streams: Its Relevance to Fish Passage Restoration through Stream Culvert Barriers. U.S. Geological Survey, OFR 2007-1140: 40. [Online] Available: <http://pubs.usgs.gov/of/2007/1140/pdf/ofr20071140.pdf> [15 Jul 2010].
- Houston, Will. 2017. "Klamath Salmon Hit 2nd Lowest Recorded Population Size in 20 Years." *Eureka Times-Standard*, July 31, 2017. <http://www.timesstandard.com/article/NJ/20170731/NEWS/170739982>.
- Humborg, C., D.J. Conley, L. Rahm, F. Wulff, A. Cociasu and V. Ittekkot. 2000. Silicon Retention in River Basins: Far-reaching Effects on Biogeochemistry and Aquatic Food Webs in Coastal Marine Environments. *Ambio* 29(1). [Online] Available: [http://www.cemus.uu.se/dokument/msd/systecology/Humborg\\_et\\_al.2000.pdf](http://www.cemus.uu.se/dokument/msd/systecology/Humborg_et_al.2000.pdf) [accessed 15 Jul 2010].
- Jameson, R.J. and K.W. Kenyon. 1977. Prey of sea lions in the Rogue River, Oregon. *J. Mammal.* 58(4):672.
- Karl, T. R., J. M. Melillo, and T. C. Peterson, editors. 2009. *Global Climate Change Impacts in the United States*. U.S. Global Change Research Program. Cambridge University Press.
- KBRA (Klamath Basin Restoration Agreement). 2010. Klamath Basin Restoration Agreement for the Sustainability of Public and Trust Resources and Affected Communities. February 18, 2010. 378 pp.
- Kelsey, D.A., C.B. Schreck, J.L. Congleton, and L.E. Davis. 2002. "Effects of juvenile steelhead on juvenile chinook salmon behaviour and physiology." *Transactions of the American Fisheries Society* 131: 676-689.
- Kinziger, Andrew P., Michael Hellmair, David G. Hankin, and John Carlos Garza. 2013. "Contemporary Population Structure in Klamath River Basin Chinook Salmon Revealed by Analysis of Microsatellite Genetic Data." *Transactions of the American Fisheries Society* 142 (5):1347-57. <https://doi.org/10.1080/00028487.2013.806351>.
- Kinziger, A.P., E.J. Loudenslager, D.G. Hankin, E.C. Anderson and J.C. Garza. 2008a. Hybridization between spring run and fall run Chinook salmon returning to the Trinity River Hatchery. *North American Journal of Fisheries Management*.
- Kinziger, A.P., M. Hellmair, and D.G. Hankin. 2008b. Genetic Structure of Chinook salmon (*Oncorhynchus tshawytscha*) in the Klamath-Trinity Basin: Implications for within-basin genetic stock identification. Hoopa Valley Tribal Fisheries Department and Humboldt State University Sponsored Programs Foundation. Arcata, CA. 115 pp.
- "Klamath Facilities Removal Final Environmental Impact Statement/Environmental Impact Report." 2012. United States Department of Interior.
- "Klamath Fishery Management Council Report and Recommendations to the Pacific Fishery Management Council." 2003. Supplemental. Klamath Fisheries Management Council. [https://www.pcouncil.org/bb/2003/0303/B5c\\_Supp\\_KFMC\\_Report\\_March2003BB.pdf](https://www.pcouncil.org/bb/2003/0303/B5c_Supp_KFMC_Report_March2003BB.pdf).



- Klamath Task Force (Klamath River Basin Fisheries Task Force). 1991. Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program. U.S. Fish and Wildlife Service, Yreka, CA.
- Klein, R., W Trush, M. Buffleben. 2008. Watershed Condition, Turbidity, and Implications for Anadromous Salmonids in North Coastal California Streams: A Report to the California North Coast Regional Water Quality Control Board. Santa Rosa, CA. 106 pp.
- Kondolf, G.M. 2000. Assessing Salmonid Spawning Gravel Quality. Transactions of the American Fisheries Society 129: 262-281. [Online] Available: [http://www.krisweb.com/krisrussian/krisdb/html/krisweb/biblio/gen\\_afs\\_kondolf\\_2000\\_99.pdf](http://www.krisweb.com/krisrussian/krisdb/html/krisweb/biblio/gen_afs_kondolf_2000_99.pdf) [accessed 15 Jul 2010].
- Kvitrud, M.A., S.D. Riemer, R.F. Brown, M.R. Bellinger, M.A. Banks. 2005. Pacific harbor seals (*Poca vitulina*) and salmon: genetics presents hard numbers for elucidating predator-prey dynamics. Marine Biology. 147:1459-1466.
- Labenia, J.S., D.H. Baldwin, B.L. French, J.W. Davis, and N.L. Scholz. 2007. Behavioral impairment and increased predation mortality in cutthroat trout exposed to carbaryl. Mar. Ecol. Proj. Serv. 329: 111. [Online] Available: <http://www.int-res.com/articles/feature/m329p001.pdf> [accessed 15 Jul 2010].
- Laetz, C.A., D.H. Baldwin, V. Hebert, J.D. Stark, and N.L. Scholz. 2009. The synergistic toxicity of pesticide mixtures: implications for ecological risk assessment and the conservation of threatened Pacific salmon. *Environmental Health Perspectives* 117: 348353. [Online] Available: <http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info%3Adoi%2F10.1289%2Fehp.0800096> [accessed 15 Jul 2010].
- LaFaunce, D.A. 1967. A king salmon spawning survey of the South Fork Trinity River, 1964. Marine Resources Branch Administrative Report 67-10.
- Leidy, R.A. and G.R. Leidy. 1984b. Life stage periodicities of anadromous salmonids in the Klamath River Basin, northwestern California. U.S. Fish and Wildlife Service, Division of Ecological Services, Sacramento, CA. 21 pp.
- Lestelle, Larry. 2012. "Effects of Dwinnell Dam on Shasta River Salmon and Considerations for Prioritizing Recovery Actions." Karuk Tribe.
- Lindley, S.T., C.B. Grimes, M.S. Mohr, W. Peterson, J. Stein, J.T. Anderson, L.W. Botsford, D.L. Bottom, C.A. Busack, T.K. Collier, J. Ferguson, J.C. Garza, A.M. Grover, D.G. Hankin, R.G. Kope, P.W. Lawson, A. Low, R.B. MacFarlane, K. Moore, M. Palmer-Zwahlen, F.B. Schwing, J. Smith, C. Tracy, R. Webb, B.K. Wells, T.H. Williams. 2009. What caused the Sacramento River fall Chinook stock collapse?: Pre-publication report to the Pacific Fishery Management Council. 57 pp.
- Lynch, M., and M. O'Healy. 2001. Captive breeding and the genetic fitness of natural populations. Conservation Genetics 2: 363-378.
- Magneson, M. 2006. Mainstem Klamath River fall Chinook salmon spawning survey 2005. U.S. Fish and Wildlife Service.
- McCullough, D.A. 1999. A Review and Synthesis of Effects of Alterations of the Water Temperature Regime on Freshwater Life Stages of Salmonids, With Special Reference to Chinook Salmon. EPA910-R-99-010. Region 10, U.S. Environmental Protection Agency, Seattle, WA. 279 pp.
- McEvoy, Arthur F. 1986. *The Fisherman's Problem: Ecology and Law in the California Fisheries, 1850-1980*. Cambridge University Press.
- Moffett, J.W., and S.E. Smith. 1950. Biological investigations of the fishery resource of Trinity River, California. U.S. Department of Interior, Fish and Wildlife Service. Special Scientific Report: Fisheries No. 12.
- Montgomery, D.R., E.M. Beamer, G.R. Pess, and T.P. Quinn. 1999. Channel type and salmonid spawning distribution and abundance. Can. J. Fish. Aquat. Sci. 56(3): 377-387. [Online] Available: <http://gis.ess.washington.edu/grg/publications/pdfs/canadian-journ-fish-aqu-sci-v56-1999.pdf> [accessed 15 Jul. 2010].
- Moyle, P.B. 2002. Inland Fishes of California, 2<sup>nd</sup> Edition. Berkeley, CA: University of California Press. 502 pp.

- Moyle, P.B., J.A. Israel, and S.E. Purdy. 2008. Salmon, Steelhead, and Trout in California, Status of an Emblematic Fauna: A report commissioned by California Trout. Center for Watershed Sciences, University of California, Davis.
- Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikrananayake. 1995. Fish Species of Special Concern of California, 2<sup>nd</sup> Ed. California Department of Fish and Game, Sacramento, CA.
- Moyle, Peter B., Rob Lusardi, and Patrick Samuel. 2017. "SOS II: Fish in Hot Water." San Francisco, CA: California Trout. <http://caltrout.org/sos/>.
- Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W. S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-35. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Dept. of Commerce, Seattle, WA. 443 pp. [Online]. Available: <http://www.nwfsc.noaa.gov/publications/techmemos/tm35/index.htm> [accessed May 12, 2010].
- Myrick, C.A., and J.J. Cech, Jr. 2001. Temperature Effects on Chinook Salmon and Steelhead: A Review Focusing on California's Central Valley Populations. Technical Publication 01-1. Sacramento, CA: Bay-Delta Modeling Forum.
- Nawa, R.K. and C.A. Frissell. 1993. "Measuring scour and fill of gravel stream beds with scour chains and sliding bead monitors." North American Journal of Fisheries management. 13: 634-639.
- Nehlsen, W., J.E. Williams and J.A. Lichatowich. 1991. Pacific salmon at the crossroads: stocks at risk from California, Oregon, Idaho, and Washington. Fisheries 16:4-21.
- NCRWQCB (North Coast Regional Water Quality Control Board). 2010. Klamath River Total Maximum Daily Loads (TMDLs) Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments In California: Final Staff Report. [Online] Available: [http://www.swrcb.ca.gov/northcoast/water\\_issues/programs/tmdl/klamath\\_river/](http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdl/klamath_river/) [accessed 15 Jul 2010].
- Nichols, K. and J.S. Foott. 2005. FY2004 Investigational report: Health Monitoring of Juvenile Klamath River Chinook Salmon. U.S. Fish & Wildlife Service California-Nevada Fish Health Center, Anderson, CA.
- Nielsen, J. L., K. D. Crow, and M. C. Fountain. 1999. "Microsatellite Diversity and Conservation of Relic Trout Population: McCloud River Redband Trout." *Molecular Ecology* 8:S129-42. <https://doi.org/10.1046/j.1365-294X.1999.00817.x>.
- NMFS (National Marine Fisheries Service). 1996. Factors for Decline: A Supplement to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act. National Marine Fisheries Service, Protected Species Branch, Portland OR. 83 p.
- NMFS (National Marine Fisheries Service). 1998. Factors Contributing to the Decline of Chinook Salmon: An Addendum to the 1996 West Coast Steelhead Factors For Decline Report. National Oceanic and Atmospheric Administration. Protected Resources Division, National Marine Fisheries Service. Portland, OR. 74 pp.
- NMFS (National Marine Fisheries Service). 2008 Biological Opinion: Environmental Protection Agency Registration of Pesticides containing Chlorpyrifos, Diazinon, and Malathion. [Online] Available: at [http://www.nmfs.noaa.gov/pr/pdfs/pesticide\\_biop.pdf](http://www.nmfs.noaa.gov/pr/pdfs/pesticide_biop.pdf) [accessed 15 Jul 2010].
- NMFS (National Marine Fisheries Service). 2009. Klamath River Basin: 2009 Report to Congress [Online]. National Oceanic and Atmospheric Administration, U.S. Dept. of Commerce. National Marine Fisheries Service. Arcata, CA 95521. Available: <http://swr.nmfs.noaa.gov/klamath/index.htm> [accessed Jul 1 2010].
- NMFS (National Marine Fisheries Service). 2010. Biological Opinion. Operation of the Klamath Project between 2010 and 2018. U.S. Bureau of Reclamation. [Online] Available: [http://swr/nmfs.noaa.gov/klamath/FINAL-Klamath\\_Ops\\_031510.pdf](http://swr/nmfs.noaa.gov/klamath/FINAL-Klamath_Ops_031510.pdf) [accessed 15 Jul 2010].
- NMFS (National Marine Fisheries Service). 2011. "Listing Endangered and Threatened Species; 90-Day Finding on a Petition to List Chinook Salmon" 76 (April):2032.

- NOAA Fisheries (National Oceanic and Atmospheric Administration Fisheries). 2003. Updated status of Federally listed ESUs of West Coast salmon and steelhead. West Coast Salmon Biological Review Team. NOAA Fisheries Northwest and Southwest Fisheries Science Centers. July 31, 2003.
- NOAA Fisheries (National Oceanic and Atmospheric Administration Fisheries). 2006. Risks to Wild Populations from Hatchery Fish [Online]. NOAA Fisheries Northwest Fisheries Science Center. Available: <http://www.nwfsc.noaa.gov/resources/salmonhatchery/risks.cfm> [accessed Jul 1 2010].
- NOAA (National Oceanic and Atmospheric Administration). 2010. Ocean ecosystem indicators 2009. Available: <http://www.nwfsc.noaa.gov/research/divisions/fed/oeip/b-latestupdates.cfm>. Accessed March 2010.
- NRC (National Research Council). 2004. Endangered and threatened fishes in the Klamath River Basin: causes of decline and strategies for recovery. National Academy of Sciences. Washington DC: The National Academies Press. 397 pp.
- Olson, A.D., and O.J. Dix. 1993. Lower Salmon River Sub-Basin Fish Habitat Condition and Utilization Assessment 1990/1991. Final Report. U.S. Dept. of Agriculture Forest Service, Klamath National Forest, Yreka, CA. 41 pp.
- ODEQ (Oregon Department of Environmental Quality). 1995. Report on the Klamath River for 1986-1995. [Online] Available: <http://www.deq.state.or.us/lab/wqm/wqindex/klamath3.htm> [accessed 15 Jul 2010].
- Petros, P., J. Dillon, R. Stocking, R. Holt, and J. Bartholomew. 2007. Salmonid Host Susceptibility to *Ceratomyxa Shasta* and Population Characteristics of Polychaete Host in the Lower Klamath River, 2006 Final Report. Hoopa Valley Tribal Fisheries, Hoopa CA and Oregon State University, Corvallis OR. 40pp.
- PFMC (Pacific Fisheries Management Council). 1988. Ninth Amendment to "The Fishery Management Plan for Commercial and Recreational Fisheries off the Coasts of Washington, Oregon, and California commencing in 1978". Pacific Fishery Management Council, 2130 S. W. Fifth Avenue, Suite 224, Portland, Oregon 97201.
- Post, G. 1987. Textbook of fish health. T.F.H., Neptune City, New Jersey.
- Prince, Daniel J., Sean M O'Rourke, Tasha Q Thompson, Omar A Ali, Hanna s Lyman, Ismail K Saglam, Thomas J Hotaling, Adrian P Spidle, and Michael R Miller. 2017. "The Evolutionary Basis of Premature Migration in Pacific Salmon Highlights the Utility of Genomics for Informing Conservation." *Science Advances*, August.
- Quigley, T.M., S.J. Arbelbide (technical editors). 1997. An assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins: volume 1. Gen. Tech. Rep. PNW-GTR-405. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Quilhillalt, R.R. 1999. Mainstem Trinity River fall Chinook salmon spawning redd survey, 1996 through 1998. U.S. Department of Interior, U.S.F.W.S. 20 pp.
- Quinn, T.P. 2005. *The Behavior and Ecology of Pacific Salmon and Trout*. Bathesda, Maryland: American Fisheries Society.
- Ricker, S J. 1997. Evaluation of salmon and steelhead spawning habitat quality in the Shasta River basin, 1997. Inland Fisheries Administrative Report 97-9.
- Rinella, D.J., M. Booz, D.L. Bogan, K. Boggs, M. Sturdy, and M.J. Rinella. 2009. Large Woody Debris and Salmonid Habitat in the Anchor River Basin, Alaska, Following an Extensive Spruce Beetle (*Dendroctonus rufipennis*) Outbreak. *Northwest Science* 83(1): 57-69. [Online] Available: <http://ddr.nal.usda.gov/bitstream/10113/33736/1/IND44251289.pdf> [accessed 15 Jul 2010].
- Roffe, T.J. and B.R. Mate. 1984. Abundance and feeding habits of pinnipeds in the Rogue River, Oregon. *J. Wildl. Manage.* 48(4): 1262-1274.
- Rykbost, K.A and B.A. Charlton. 2001. Nutrient Loading of Surface Waters in the Upper Klamath Basin: Agriculture and Natural Sciences, Special Report 1023, Agricultural Experiment Station, Oregon State University. Available:

- [http://scholarsarchive.library.oregonstate.edu/jspui/bitstream/1957/6244/1/SR%20no.%201023\\_OC\\_R.pdf](http://scholarsarchive.library.oregonstate.edu/jspui/bitstream/1957/6244/1/SR%20no.%201023_OC_R.pdf) [accessed 15 Jul 2010].
- Salter, John. 2003. "The Effect of the Klamath Hydroelectric Project on Traditional Resource Uses and Cultural Patterns of the Karuk People within the Klamath River Corridor."  
<http://mkwc.org/old/publications/fisheries/Karuk%20White%20Paper.pdf>.
- Scarnecchia. 1981. Effects of streamflow and upwelling on yield of wild coho salmon (*Oncorhynchus kisutch*) in Oregon. Canadian Jour. Fish. Aquat. Sci. 38:471-475.
- Scheffer, T. H., and C.C. Sperry. 1931. Food Habits of the Pacific harbor seal, *Phoca Vitulina richardsi*. J. Mammal. 12(3):214-226.
- Scholz, N.L., N. Truelove, B.L. French, B.A. Berejikian, T.P. Quinn, E. Casillas, and T.K. Collier. 2000. Diazinon disrupts antipredator and homing behaviors in chinook salmon (*Oncorhynchus tshawytscha*). Canadian Journal of Fisheries and Aquatic Sciences, 57: 1911-1918.
- Schreck, C.B. 1987. Stress measurement. Pages 89-96 In: Improving hatchery effectiveness as related to smoltification, Proceedings of smolt workshop. Warm Springs, Oregon.
- Schwing, F., S. Bograd, R. Dotson, P. Dutton, K. Forney, D. Griffith, N. Lo, B. McFarlane, M. Mohr, S. Ralston, W. Sydeman, D. Watters, W. Watson, B. Wells. Recent Ecological Conditions in the California Current Ecosystem-An Assessment for the Ecosystem Approach to Resource Management. 2005. Southwest Fisheries Science Center. 13 pp.
- Smith, V.H., G.D. Tilman, and J.C. Nekola. 1999. Eutrophication: impacts of excess nutrient inputs on freshwater, marine, and terrestrial ecosystems. Environmental Pollution 100(1-3): 179-196. [Online] Available: <http://teaching.ust.hk/~bisc529/HK/Env%20Poll%201999v100n1-3p179-196%20smith%20et%20al.pdf> [accessed 15 Jul 2010].
- Snyder, J.O. 1931. Salmon of the Klamath River, California, California Department of Fish and Game Bulletin 34. Sacramento, CA: California State Print. Off. 130 pp.
- Sommerstram, S., E. Kellogg, and J. Kellogg. 1990. Scott River Watershed Granitic Sediment Study. Prepared by Tierra Data Systems, for Siskiyou Resource Conservation District, Etna, CA. [Online]. Available: [http://www.krisweb.com/biblio/klamath\\_srcd\\_sommerstrometal\\_1990.pdf](http://www.krisweb.com/biblio/klamath_srcd_sommerstrometal_1990.pdf) [accessed 15 Jul 2010].
- Spence, B.C., G. A. Lomnický, R. M. Hughes, and R.P. Novitzki. 1996. An Ecosystem Approach to Salmonid Conservation. TR-4501-96-6057. Man-Tech Environmental Research Services Corp., Corvallis, OR. (Available from the National Marine Fisheries Service, Portland, OR.)
- SRRC (Salmon River Restoration Council). 2017. Salmon River history timeline: 1849-present. Website. <http://srrc.org/history/timeline.php> [Accessed 12 October 2017].
- SRRC (Salmon River Restoration Council). 2018. Fire Planning and Fuels Reduction Program. Website. <http://srrc.org/programs/firefuels.php> [Accessed 14 June, 2018]
- SRRC (Salmon River Restoration Council). 2016. Salmon River Collaborative In-stream Restoration Working Group, Salmon River In-stream Candidate Action Table.
- Stillwater Sciences. 2018. Salmon River Floodplain Habitat Enhancement and Mine Tailing Remediation Project. Phase 1: Technical Analysis of Opportunities and Constraints. Prepared by Stillwater Sciences, Arcata, California for Salmon River Restoration Council, Sawyers Bar, California. . [Online] Available: <http://srrc.org/publications/programs/habitatrestoration/Salmon%20River%20Floodplain%20Habitat%20Enhancement%20Tech%20Memo%202017.pdf> [Accessed 26 Feb 2018].
- Stocking, R.W. and J.L. Bartholomew. 2004. Assessing links between water quality, river health and Ceratomyxosis of salmonids in the Klamath River system. Department of Microbiology, Oregon State University, Corvallis, OR. 5 p.
- Strange, J.S. 2003. Adult Chinook Salmon Migration in the Klamath River Basin: 2003 Radio Telemetry Study Final Report. Yurok Tribal Fisheries Program. 70 pp.
- Strange, J.S. 2007. Adult Chinook Salmon Migration in the Klamath River Basin: 2005 Sonic Telemetry Study Final Report. Yurok Tribal Fisheries Program and School of Aquatic and Fishery Sciences, University of Washington. 96 pp.

- Stumpf, G. 1979. Gold mining in Siskiyou County, 1850-1900. Siskiyou County Historical Society, Yreka, California.
- Sullivan, C.M. 1989. Juvenile life history and age composition of mature Fall Chinook salmon returning to the Klamath River, 1984-1986 Humboldt State University.
- Sullivan, A.B., D.M. Snyder, and S.A. Rounds. 2010. Controls on Biochemical Oxygen Demand in the upper Klamath River, Oregon. *Chemical Geology* 269: 12-21. [Online] Available: [http://or.water.usgs.gov/proj/keno\\_reach/download/chemgeo\\_bod\\_final.pdf](http://or.water.usgs.gov/proj/keno_reach/download/chemgeo_bod_final.pdf) [accessed 15 Jul 2010].
- Termini, Valerie. 2016. "Notice of Proposed Changes in Regulations." California Fish and Game Commission. [http://www.fgc.ca.gov/regulations/2017/7\\_50\\_kt\\_ntc.pdf](http://www.fgc.ca.gov/regulations/2017/7_50_kt_ntc.pdf).
- "The Watershed Research and Training Center." n.d. Accessed August 7, 2017. <https://thewatershedcenter.com/projects-in-action/save-our-spring-chinook/>.
- Thompson, J.R., T.A. Spies, and L.M. Ganio. 2007. Reburn severity in managed and unmanaged vegetation in a large wildfire. *Proceedings of the National Academy of Sciences of the USA* 104: 10743-10748. [Online] Available: <http://www.pnas.org/content/104/25/10743.full> [accessed 15 Jul 2010].
- Thompson, Tasha Q., Renee M. Bellinger<sup>3</sup>, Sean M. O'Rourke, Daniel J. Prince<sup>1</sup>, Alexander E. Stevenson, Antonia T. Rodrigues, Matthew R. Sloat, Camilla F. Speller, Dongya Y. Yang, Virginia L. Butler, Michael A. Banks, Michael R. Miller. 2018. Anthropogenic habitat alteration leads to rapid loss of adaptive variation and restoration potential in wild salmon populations. *bioRxiv*. <http://biorxiv.org/content/early/2018/05/14/310714.abstract> [Accessed 26 June 2018]
- Trihey and Associates, Inc. 1996. Instream Flow Requirements for Tribal Trust Species in the Klamath River. Prepared by Trihey and Associates, Inc., Concord, CA, for the Yurok Tribe, Eureka, CA. 43 pp. [Online]. Available: [http://www.krisweb.com/biblio/klamath\\_yurok\\_trihey\\_1996\\_flow.pdf](http://www.krisweb.com/biblio/klamath_yurok_trihey_1996_flow.pdf) [accessed Jun 8 2010].
- True, K., J.S. Foott, A. Bolick, S. Benson and R. Fogerty. 2010. FY 2009 Investigational Report: Myxosporean Parasite (*Ceratomyxa shasta* and *Parvicapsula minibicornis*) Incidence and Severity in Klamath River Basin Juvenile Chinook Salmon, April-August 2009. U.S. Fish & Wildlife Service California-Nevada Fish Health Center, Anderson, CA. [Online]. Available: <http://www.fws.gov/arcata/fisheries/reports/technical/Final%20KR09%20Report%20May%206%202010.pdf> [Accessed: Jun 10 2010].
- USBR (United States Bureau of Reclamation). 2001. Biological Assessment of Klamath Project's Continuing Operations on the Endangered Lost River Sucker and Shortnose Sucker. U.S. Department of the Interior, U.S. Bureau of Reclamation, Mid-Pacific Region, Klamath Basin Area Office, Klamath Falls, OR. February 13, 2001. [Online] Available: [http://permanent.access.gpo.gov/lps19783/final\\_ba\\_012201\\_sutton.pdf](http://permanent.access.gpo.gov/lps19783/final_ba_012201_sutton.pdf) [accessed 15 Jul 2010].
- USBR (United States Bureau of Reclamation). 2010. Approved Pesticide Use Proposals for Lease Lands within the Tule Lake and Lower Klamath National Wildlife Refuges California/Oregon.
- USFWS (United States Fish and Wildlife Service). 1979. Klamath River fisheries investigations: Progress, problems and prospects. U.S. Fish and Wildlife Service Annual Report, Arcata, California, Nov. 21, 1979, 49 pp.
- USFWS (United States Fish and Wildlife Service). 2001. Juvenile salmonid monitoring on the mainstem Klamath River at Big Bar and mainstem Trinity River at Willow Creek, 1997-2000. Annual Report of the Klamath River Fisheries Assessment Program. Arcata Fish and Wildlife Office, Arcata, CA.
- USGS (United States Geological Survey). 2009. Klamath River Water Quality Data from Link River Dam to Keno Dam, Oregon, 2008. Open-File Report 2009-1105. [Online] Available: <http://pubs.usgs.gov/of/2009/1105/pdf/ofr20091105.pdf> [accessed 15 Jul 2010].
- USGS (United States Geological Survey). 2010. Water-Quality Data from Upper Klamath and Agency Lakes, Oregon, 2007-08. Open-File Report 2010-1073. [Online] Available: <http://pubs.usgs.gov/of/2010/1073/of20101073.pdf> [accessed 15 Jul 2010].
- Van Kirk, R.W., and S.W. Naman. 2008. Relative Effects of Climate and Water Use on Base-Flow Trends in the Lower Klamath Basin. *Journal of the American Water Resources Association (JAWRA)*

- 44(4):1035-1052. [Online] Available: <http://www.fws.gov/arcata/fisheries/reports/technical/Van%20Kirk%20and%20Namen%20Base%20flow%20Trends%20JAWRA.pdf> [accessed 15 Jul 2010].
- Van Steeter, M.M, and J. Pitlick. 1998. Geomorphology and endangered fish habitats of the upper Colorado River: Historic changes in streamflow, sediment load, and channel morphology. *Water Resources Research* 34: 287–302. [Online] Available: [http://limnoreferences.missouristate.edu/assets/limnoreferences/Van\\_Steeter\\_Pitlick\\_1998\\_geomorphology.pdf](http://limnoreferences.missouristate.edu/assets/limnoreferences/Van_Steeter_Pitlick_1998_geomorphology.pdf) [accessed 15 Jul 2010].
- Wales, J.H. 1951. "The Decline of the Shasta River King Salmon Run." California Department of Fish and Game.
- Waples, R. S. 1995. Evolutionarily significant units and the conservation of biological diversity under the Endangered Species Act. In J. L. Nielsen, ed. *Evolution and the Aquatic Ecosystem: Defining Unique Units in Population Conservation*, pp. 8–27. American Fisheries Society, Bethesda, MD, USA.
- Waples, Robin. 1991. "Definition of 'Species' Under the Endangered Species Act: Application to Pacific Salmon." National Marine Fisheries Service. [http://docs.lib.noaa.gov/noaa\\_documents/NMFS/TM\\_NMFS\\_FNWC/TM\\_NMFS\\_FNWC\\_194\\_files/TM\\_NMFS\\_FNWC\\_194.htm](http://docs.lib.noaa.gov/noaa_documents/NMFS/TM_NMFS_FNWC/TM_NMFS_FNWC_194_files/TM_NMFS_FNWC_194.htm).
- Waples, Robin, David J. Teel, James M. Myers, and Anne R. Marshall. 2004. "Life-History Divergence in Chinook Salmon; Historic Contingency and Parallel Evolution." *Evolution* 58 (2):386–403. <https://doi.org/10.1111/j.0014-3820.2004.tb01654.x>.
- Weitkamp, D.E. 2001. Chinook Capacity to Adapt to Saltwater. Parametrix Inc. Kirkland, Washington, USA.
- West, J.R. 1991. A proposed strategy to recover endemic spring run Chinook salmon population and their habitats in the Klamath River basin. Report to the Forest Service, Pacific Southwest Region. 26 pp. [Online]. Available: [http://www.krisweb.com/biblio/klamath\\_usfs\\_west\\_1991.pdf](http://www.krisweb.com/biblio/klamath_usfs_west_1991.pdf) [accessed on 8 Jun 2010].
- Werner, Francisco. 2011. "Finding of Upper Klamath Trinity River Chinook Salmon Biological Review Team," December 27, 2011.
- Williams, T.H., J.C. Garza, N. Hetrick, M.S. Lindley, M.S. Mohr, J.M. Myers, R.O. O'Farrell, R.M. Quinones, and D.J. Teel. 2011. "Upper Klamath and Trinity River Chinook Salmon Biological Review Team Report."
- Williamson, K. and Hillemeier, D. 2001. An assessment of pinniped predation upon fallrun Chinook salmon in the Klamath River estuary, CA, 1999. Yurok Tribal Fisheries Program Technical Report. Klamath, CA. 50p.
- Wofford, P., K. Goh, D. Jones, H. Casjens, H. Feng, J. Hsu, D. Tran, J. Medina, and J. White. 2003. Forest Herbicide Residues in Surface Water and Plants in the Tribal Territory of the Lower Klamath River Watershed of California. Report prepared for the California Department of Pesticide Regulation. [Online] Available: <http://pestreg.cdpr.ca.gov/docs/emon/pubs/ehapreps/eh0205.pdf> [accessed 15 Jul 2010].



2018 OCT -8 PM 2:45

## Memorandum

Date: October 5, 2018

To: Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: Request for 30-day extension, Upper Klamath-Trinity Spring Chinook Salmon  
(*Oncorhynchus tshawytscha*)

The Department of Fish and Wildlife (Department) requests a 30-day extension of time pursuant to Fish and Game Code section 2073.5 to allow the Department additional time to analyze and evaluate the petition to list Upper Klamath-Trinity Spring Chinook Salmon (*Oncorhynchus tshawytscha*) under the California Endangered Species Act and to complete our evaluation report. This extension would change the due date for the Department's evaluation from 90 days due on Sunday October 31, 2018 to 120 days due on Tuesday November 30, 2018.

If you have any questions or need additional information, please contact Mr. Jonathan Nelson, Environmental Program Manager at [Jonathan.Nelson@Wildlife.ca.gov](mailto:Jonathan.Nelson@Wildlife.ca.gov) or at (916) 445-4506. You can also contact Mr. Tony LaBlanca, Environmental Program Manager at [Tony.LaBanca@wildlife.ca.gov](mailto:Tony.LaBanca@wildlife.ca.gov) or at (707) 499-3155.

cc: **Department of Fish and Wildlife**

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Melissa Miller-Henson  
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October 5, 2018  
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## Fish and Game Commission



*Wildlife Heritage and Conservation  
Since 1870*

### WILDLIFE RESOURCES COMMITTEE

Committee Co-Chairs: Commissioner Williams and Commissioner Burns

### September 20, 2018 Meeting Summary

Following is a summary of the Wildlife Resources Committee (WRC) meeting as prepared by staff. An audio recording of the full meeting may be accessed online at [www.fgc.ca.gov/meetings](http://www.fgc.ca.gov/meetings).

#### Call to order

The meeting was called to order at 1:00 p.m. by Commissioner Williams at the Natural Resources Building, 12<sup>th</sup> Floor Conference Room, 1416 Ninth Street, Sacramento. Commissioner Williams gave welcoming remarks.

Ari Cornman introduced California Fish and Game Commission (Commission) staff and California Department of Fish and Wildlife (Department) staff, and outlined the meeting procedures and guidelines, noting that the Committee is a non-decision making body that provides recommendations to the Commission. He reminded participants that the meeting was being audio-recorded and that the recording will be posted to the Commission website.

The following individuals were in attendance:

#### **Committee Co-Chairs**

Anthony Williams	Present
Russell Burns	Absent

#### **Commission Staff**

Valerie Termini	Executive Director
Melissa Miller-Henson	Deputy Executive Director
Ari Cornman	Wildlife Advisor
Craig Castleton	Regulatory Analyst
Sergey Kinchak	Staff Services Analyst

#### **Department Staff**

Kevin Shaffer	Chief, Fisheries Branch
Kari Lewis	Chief, Wildlife Branch
Patrick Foy	Captain, Law Enforcement Division
Erin Chappell	Nongame Program Manager, Wildlife Branch

Brad Burkholder	Environmental Program Manager, Wildlife Branch
Eric Larson	Environmental Program Manager, Bay-Delta Region
Karen Mitchell	Senior Environmental Scientist, Fisheries Branch
Scott Gardner	Senior Environmental Scientist, Wildlife Branch

### **1. Approve agenda and order of items**

The Committee approved the agenda and order of items.

### **2. Public comment for items not on the agenda**

A commenter discussed ferrets and asked to see evidence of a “verifiable, self-sustaining, feral ferret colony” and gave several comments in support of allowing ferrets as pets.

A commenter spoke about regulations for individual bag limits versus boat limits when fishing for finfish. He was advised that the request would require a regulation change and that he would need to petition the Commission for the change.

A commenter highlighted the wildlife habitat lost to recent large wildfires and suggested that hunting in fire-damaged areas should be closed for the next season until assessments can be conducted on the impacts to wildlife.

### **3. Department updates**

#### **(A) Wildlife Branch**

Kari Lewis indicated that the elk management plan is nearing completion, and progress is being made on the bighorn sheep and deer management plans. The Department has recently hired a human dimensions expert and an R3 (recruit, retain and reactivate) coordinator.

Kari also discussed DFW’s response to the wildfires. Kevin Shaffer highlighted that the joint Commission/State Board of Forestry and Fire Protection policy was an effective tool, but that implementation may have waned over the years.

#### **(B) Fisheries Branch**

Kevin Shaffer discussed the strategic trout and trout hatchery plan, and that there will be future opportunities for input in early 2019. Karen Mitchell gave a presentation on the sportfish regulation revisions project under development by the Department.

#### **(C) Law Enforcement Division**

Patrick Foy mentioned that new wildlife officers are being added to the field after graduation from the academy and asked the fishing guides for patience as the new officers become more proficient in their jobs. He also highlighted the work of the Department Wildlife Investigations Lab in poaching and wildlife attack verification analyses.

#### *Public Discussion*

A commenter asked how academy classes were filling up. Patrick explained the academy

cycle and a brief overview of the recruiting process. Another commenter brought up the problem of recruitment and retention issues. Another commenter asked about who is selected to be field training officers, and Patrick explained the selection process.

#### **4. Initial recommendations for 2019-20 regulations**

Upland (resident) game birds was the only rulemaking on the calendar for initial vetting. Scott Gardner gave a presentation on upland game bird populations, focusing on sage grouse and pheasants.

##### *Public Discussion*

Commissioner Williams asked about the prospects for next year's sage grouse tags, and Scott talked about the social and biological factors surrounding hunting recommendations from Department. A participant asked about increasing shooting hours for wild turkey; Scott enumerated some of the concerns with the idea, but stated that the Department would continue to speak with stakeholders about expanding turkey hunting opportunities. A commenter suggested that wildlife area managers be given the discretion to determine end times for hunting. Another commenter indicated that Pheasants Forever would be willing to supply birds for introduction on public lands.

#### **5. Committee recommendations for annual regulations**

Ari Cornman provided some background and introduced the topic.

##### **(A) Mammal hunting**

Brad Burkholder gave a presentation and stated that the Department would be revisiting tag quotas and hunt zones for some species, including bighorn sheep and elk. No changes to deer or antelope were anticipated.

##### *Public Discussion*

Several participants expressed the judgment that elk and bighorn sheep populations could support higher quotas in some areas, especially for mature rams, and that some hunt zones could be split into smaller hunt periods or reconfigured. Another commenter pointed out that other states have higher relative sheep quotas. Brad indicated that the Department wants to plan for the long-term health of herds, but is in general agreement with trying to increase hunting opportunities, including sheep fund-raising tags. Other commenters gave specific recommendations and urged completion of the bighorn sheep management plan. A participant asked about elk depredation, and Brad responded that there has been an increase on the north coast and in the La Panza area. A commenter recommended a thorough assessment of wildlife populations in areas burned by wildfires, a hiatus on hunting in those areas, and habitat assessments for various life history factors.

##### **(B) Waterfowl hunting**

Brad enumerated three waterfowl recommendations: (1) a falconry-only season, (2) allowing "small" in addition to "large" Canada geese in the Northeastern Zone and

Klamath Basin Special Management Area (SMA), and (3) adjusting the timing of Imperial County SMA.

*Public Discussion*

A non-governmental organization participant indicated that he believed his members would likely support the proposals.

**(C) Central Valley Chinook salmon sport fishing**

Karen Mitchell talked about the plans for regulatory options in the Central Valley Chinook salmon fishery, including the possibility of a jack fishery.

*Public Discussion*

A participant asked about the range being considered for jacks, that there were claims of overfishing despite hatcheries euthanizing large numbers of fish, asked for more time for stakeholder involvement, and recounted the economic impacts of reduced fishing opportunities. Karen indicated that Department staff had not met yet to discuss the issue, but the range of jacks was likely going to be 0-4. Kevin clarified that overfishing of salmon was not due to recreational anglers. Valerie Termini clarified that the term “overfishing” is a specifically-defined term from the Magnuson–Stevens Fishery Conservation and Management Act.

**(D) Klamath River Basin salmon sport fishing**

Karen Mitchell introduced the topic.

*Public Discussion*

A commenter thanked the Department for its compliance program, which puts large amounts of water back in the rivers. Another commenter asked for jacks in the Klamath system, said that the one-fish limit was a positive to encourage longer seasons, and asked for an adult “clipped” fish.

*Committee Recommendation*

WRC recommended that the Commission authorize publication of notices of intent to amend mammal hunting, waterfowl hunting, Central Valley Chinook salmon sport fishing, and Klamath River Basin salmon sport fishing regulations for the 2019-20 seasons.

**6. Low-flow regulations on coastal streams**

**(A) FGC Petition #2015-14: Mendocino, Sonoma and Marin counties’ coastal streams**

**(B) FGC Petition #2015-15: Russian River**

Ari Cornman provided background information, and Commissioner Williams expressed particular interest in the Department’s stakeholder engagement efforts. Kevin Shaffer provided an overview of the petitions, stakeholder engagement efforts, and Department



recommendations to deny the petitions based on a number of factors. Ari noted that the Commission staff recommendation was to approve the Department's recommendation.

#### *Public Discussion*

Commissioner Williams thanked the Department for providing the abundance of data and information in support of the recommendation. A participant asked if the State Water Resources Control Board had offered (or been in discussion) to purchase more water gauges. Kevin said that he believed they had, but would check. Eric Larson stressed that management in these rivers is an adaptive process.

#### *Committee Direction*

WRC recommended that the Commission deny petitions #2015-14 and #2015-15.

### **7. Deer and elk tag validation regulations**

Patrick Foy explained that the regulatory language that identifies which firefighters are eligible to validate harvested deer and elk is outdated. He recommended specifying a "full-time firefighter" or something similar.

#### *Public Discussion*

A commenter stated that current regulations specify county firefighters and suggested adding city firefighters as well. Patrick explained concerns that some individuals who sign off on harvest tags may not fully understand what they are signing off on (e.g., a spike buck); current regulations do not address this issue.

#### *Committee Recommendation*

WRC recommended that the Commission authorize publication of a notice of its intent to amend deer and elk tag validation regulations as proposed.

### **8. Archery equipment and crossbow regulations**

Patrick Foy explained that current regulations require a bow that can cast an arrow 130 yards. Other states do not use this measure – most use a 30- to 40-pound draw rate. Forty pounds was indicated as the preferred weight, but there were also concerns about the mobility impaired community that might warrant a lesser draw weight.

#### *Public Discussion*

Commenters stated that the Department was waiting for some more data, but were generally supportive of a 40-pound weight.

#### *Committee Recommendation*

WRC recommended that the Commission authorize publication of a notice of its intent to amend archery equipment and crossbow regulations as proposed.

## 9. Bullfrogs and non-native turtles

Ari Cornman gave a presentation outlining the environmental issues with bullfrogs and non-native turtles, as well as reviewing the stakeholder engagement plan that was presented to the Commission last year. He also presented an updated timeline that would be presented to the Commission for approval in October 2018.

### *Public Discussion*

Commissioner Williams asked about referring the issue to the WRC. A commenter gave a history of the issue before the Commission, stated that it was a mistake to involve diverse stakeholders, and supported a ban on the importation of bullfrogs. A participant requested to represent a constituency on the stakeholder group. Commissioner Williams expressed that diverse perspectives should be sought, and perhaps part of the problem in the past is that all stakeholders had not been represented.

## 10. Delta Fisheries Management Policy

Ari Cornman presented a background and history of the issue. He introduced a draft Delta Fisheries Management Policy that was developed to implement the first recommendation from the Delta Fisheries Forum.

### *Public Discussion*

Commissioner Williams conveyed his desire to have a high-level dialogue about the policy rather than discuss details, and that WRC will have more discussions about it in the future. A commenter said that the policy should address aquatic vegetation. Another commenter expressed concerns that anglers had been noticing dead fish and wildlife in the Sacramento-San Joaquin River Delta. Kevin Shaffer affirmed that the Department is aware of the issue and is engaged with other agencies in exploring the problem. Another commenter encouraged interagency collaboration.

One commenter suggested that the policy be grounded in scientific objectivity; Ari agreed but pointed out that the policy needs to encapsulate scientific uncertainties as well. Another suggestion was that the Commission grapple over whether to prioritize listed species over other species. Kevin Shaffer and Valerie Termini gave some context to the policy. Ari raised the prospect of repealing the Commission's striped bass policy along with the adoption of the Delta fisheries management policy.

## 11. Future agenda items

- (A) Review work plan agenda topics and timeline**
- (B) Potential new agenda topics for FGC consideration**

Topics identified for the next WRC meeting included:

- Agency updates
- Upland game bird annual package
- Delta Fisheries Management Policy
- Sport fish regulation revisions

*Public Discussion*

No comments received.

**Adjourn**

The Committee adjourned at 4:22 p.m.

**Wildlife Resources Committee (WRC) 2018-19 Work Plan**  
**Scheduled Topics and Timeline for**  
**Items Referred to WRC by the California Fish and Game Commission**  
Updated for Oct 17, 2018 FGC Meeting

Topic	Category	2018	2019		
		SEP	JAN	MAY	SEP
		Sacramento	Riverside	Sacramento	Santa Rosa
Annual Regulations					
Upland (Resident) Game Birds	Annual	X	X/R		
Sport Fishing	Annual	X/R			
Mammal Hunting	Annual	X/R			
Waterfowl	Annual	X/R			
Central Valley Salmon Sport Fishing	Annual	X/R			
Klamath River Basin Sport Fishing	Annual	X/R			
Regulations & Legislative Mandates					
Falconry	Referral for Review				
Archery/Crossbow	Referral for Review	X/R			
Deer/Elk Tag Verification	Referral for Review	X/R			
Coastal Streams Low-Flow Regulations	Referral for review	X/R			
Sportfish Regulations Revision	Informational		X		
Bullfrogs and Non-native Turtles	Informational	X			
Special Projects					
Emerging Management Issues					
Lead Ban Implementation	DFW Project				
Wild Pig Management	Referral for Review				
Policies					
Delta Fisheries Forum Recommendations and Delta Fisheries Policy	Referral for Review	X	X	X	
Legislation					

**KEY:    X    Discussion scheduled    X/R    Recommendation developed and moved to FGC**

**STAFF SUMMARY FOR AUGUST 22-23, 2018****25. SPORT FISHING (ANNUAL)****Today's Item**Information ☐Action ☒

Consider authorizing publication of notice of intent to amend sport fishing regulations for the 2019 seasons.

**Summary of Previous/Future Actions**

- |                                 |                                 |
|---------------------------------|---------------------------------|
| • WRC vetting                   | Jan 11, 2018; Santa Rosa        |
| • <b>Today's notice hearing</b> | <b>Aug 22-23, 2018; Fortuna</b> |
| • Discussion hearing            | Oct 17-18, 2018; Fresno         |
| • Adoption hearing              | Dec 12-13, 2018; Oceanside      |

**Background**

The Department is proposing three changes to current regulations, related to the definition of inland definition, Lake Perris bass, and sport fishing report cards.

***Inland Waters Definition (Exhibit 1)***

The current definition of inland waters can be confusing to anglers who want to fish two rods in a bay, but are not sure if a second rod validation is required; a second-rod validation is only required in inland waters. However, the current definition is not clear whether inland waters include or exclude bays. The definition reads, "Inland waters exclude the waters of San Francisco Bay and the waters of Elkhorn Slough..." The only bay specifically excluded in the definition is San Francisco Bay. Title 14, Section 27.00, Definition of the Ocean and San Francisco Bay District reads, "The ocean is...the waters of open or enclosed bays contiguous to the ocean," which clearly states that all bays are considered waters of the ocean. To be consistent and clear, DFW believes the definition of inland waters should state that all bays are excluded, not just San Francisco Bay, and, therefore, a second rod validation is not required in a bay.

***Lake Perris Largemouth Bass Size and Bag Limit (Exhibit 1)***

The current regulations were changed in 2009 to protect the fishery when the lake was drawn down by 43% to repair the dam. DFW placed 1,484 brush habitat structures into the remnant lake from 2008-2016 and built 109 rock reefs with approximately 109,000 square feet of gravel/cobble rock areas. The dam repair has been completed and the water is restored to an 80% pool. DFW proposes to re-establish the bass regulations to the statewide standard of 5 fish at 12 inches.

***Sport Fishing Report Cards Requirements (Exhibit 2)***

Report card regulations include requirements for reporting harvest; however, they do not include a mechanism for confirming that data from a report card has been reported. This proposal would require report card holders who submit data online to write the provided

## STAFF SUMMARY FOR AUGUST 22-23, 2018

confirmation number on their card and retain the card until 90 days after the reporting deadline. The objectives of the proposed regulations are to:

- Ensure continued fishing opportunities for anglers in California by providing the Department with more timely, accurate and comprehensive data on success and take levels;
- Establish a retention period of 90 days, during which time the Department may request the angler surrender the report card to audit the reporting process; and
- Establish consistency with other report card procedures that include a 90-day retention period.

Additionally, when a report card is lost, a licensee may wish to obtain a replacement, or may simply need to fulfill the harvest reporting requirement before the reporting deadline. There are currently no guidelines for licensees who have lost their report card and need to report their harvest, but do not need to obtain a replacement card. This proposal updates lost report card procedures to provide guidelines for obtaining a replacement card, and for reporting harvest from a lost card without obtaining a replacement.

**Significant Public Comments**

**FGC staff:** Authorize publication of notice as recommended by DFW.

**Committee:** This proposal was supported at the Jan 11, 2018 WRC meeting in Santa Rosa.

**DFW:** Authorize publication of notice as detailed in the draft initial statement of reasons (ISOR).

**Exhibits**

1. ISOR, sections 1.53 and 5.00
2. ISOR, Section 1.74
3. DFW memo, received Jul 11, 2018
4. Economic and fiscal impact statement (Std. 399)
5. DFW presentation

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission authorizes publication of a notice of its intent to amend sport fishing regulations for the 2019 seasons.



STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION  
(Pre-publication of Notice Statement)

Amend Sections 1.53 and 5.00,  
Title 14, California Code of Regulations  
Re: Annual Sport Fishing Regulations - Freshwater Sport Fishing Amendments

- I. Date of Initial Statement of Reasons: March 16, 2018
- II. Dates and Locations of Scheduled Hearings:
  - (a) Notice Hearing: Date: August 23, 2018  
Location: Fortuna
  - (b) Discussion Hearing: Date: October 18, 2018  
Location: Fresno
  - (c) Adoption Hearing: Date: December 13, 2018  
Location: Oceanside

III. Description of Regulatory Action:

- (a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

This California Department of Fish and Wildlife (Department) proposal requests changes to Title 14, California Code of Regulations (CCR), for the Annual Sport Fishing Regulations review cycle. This proposal will clarify that inland waters do not include bays, increase fishing opportunities for black bass in Perris Lake, and make needed corrections to existing regulations. The proposed regulatory changes are needed to reduce public confusion and improve regulatory enforcement.

The Department is proposing the following changes to current regulations:

**INLAND WATERS DEFINITION**

The current definition of inland waters can be confusing to anglers who want to fish two rods in a bay, but are not sure if a second rod validation is required. A second-rod validation is only required in inland waters. However, the current definition of Inland Waters (Title 14, Section 1.53) is not clear if inland waters include or exclude bays. The definition reads, "Inland waters exclude the waters of San Francisco Bay and the waters of Elkhorn Slough..." The definition only excludes San Francisco Bay. Title 14, Section 27.00, Definition of the Ocean

and San Francisco Bay District reads, “The ocean is...the waters of open or enclosed bays contiguous to the ocean.” This definition clearly states that all bays are considered waters of the ocean. To be consistent and clear, the definition of inland waters should state that all bays are excluded, not just San Francisco Bay. Amending the definition will clarify that inland waters do not include bays and, therefore, a second rod validation is not required in a bay.

Proposal: Amend Section 1.53, Inland Waters

Amend Section 1.53 to clarify that inland waters do not include bays.

**LAKE PERRIS LARGEMOUTH BASS SIZE AND BAG LIMIT**

The regulations were changed in 2009 to protect the fishery when the lake was drawn down by 43% to repair the dam. The dam repair is to be completed and the water was to be restored to nearly full pool in late 2017. CDFW placed 1,484 brush habitat structures into the remnant lake in 2008-2016 and built 109 rock reefs with approximately 109,000 sq/ft of gravel/cobble rock areas. In addition, once the water levels were restored, 12 years of terrestrial vegetation growth will be available in the littoral zone to help re-establish the bass population negating the need to protect the fishery beyond the statewide standard any further.

Proposal: Amend Section 5.00(B)(22), Perris Lake

Restore the black bass regulation at Lake Perris to the statewide standard 5 fish at 12 inches from 2 fish at 15 inches.

**Updates to Authority and Reference Citations Based on Recent Legislation**

Senate Bill 1473 (Stats. 2016, Ch. 546) made organizational changes to the Fish and Game Code that became effective January 1, 2017. The changes included moving the Commission’s exemptions from specified Administrative Procedure Act time frames from Section 202 to Section 265 of the Fish and Game Code, moving the Commission’s effective date procedures from Section 215 to Section 270 of the Fish and Game Code, moving the Commission’s effective period procedures from Section 220 to Section 275 of the Fish and Game Code, and moving the Commission’s authority to adopt emergency regulations from Section 240 to Section 399 of the Fish and Game Code. In accordance with these changes to the Fish and Game Code, sections 202, 215, and 220 are removed from, and sections 265, 270, and 275 are added to, the authority and reference citations for this rulemaking.

**Minor Editorial Corrections for Clarity**

In addition to the above proposals, minor editorial corrections are proposed to correct typographical errors and to improve regulation clarity.

**Benefits of the Proposed Regulations**

It is the policy of this state to encourage the conservation, maintenance, and utilization of the living resources of the ocean and inland waters under the

jurisdiction and influence of the state for the benefit of all the citizens of the State. In addition, it is the policy of this state to promote the development of local California fisheries in harmony with federal law respecting fishing and the conservation of the living resources of the ocean and inland waters under the jurisdiction and influence of the State. The objectives of this policy include, but are not limited to, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence and the maintenance of a sufficient resource to support a reasonable sport use. Adoption of scientifically-based trout and salmon seasons, size limits, and bag and possession limits provides for the maintenance of sufficient populations of trout and salmon to ensure their continued existence.

The benefits of the proposed regulations are concurrence with Federal law, sustainable management of California's trout and salmon resources, and promotion of businesses that rely on recreational sport fishing in California.

- (b) Authority and Reference Sections from Fish and Game Code for Regulation:

Authority: Sections 200, 205, 265, 270, 275, 1050, 1053.1, 1055.1, 7380 and 8491, Fish and Game Code.

Reference: Sections 110, 200, 205, 255, 265, 270, 275, 713, 1050, 1053.1, 1055.1, 7149.8, 7380, 7381, and 7382, Fish and Game Code.

- (c) Specific Technology or Equipment Required by Regulatory Change:

None.

- (d) Identification of Reports or Documents Supporting Regulation Change:

None.

- (e) Public Discussions of Proposed Regulations Prior to Notice Publication:

No public meetings are scheduled prior to the notice publication. The 45-day public notice comment period provides adequate time for review of the proposed changes.

#### IV. Description of Reasonable Alternatives to Regulatory Action:

- (a) Alternatives to Regulation Change:

Striped Bass Petition

Petition #2017-012; received by the Commission November 2, 2017; at its February 7-8, 2018 meeting the Commission granted for consideration in

the 2018 rulemaking package for the 2019-2020 angling season.

Petitioner requests a change to the striped bass fishing regulations to protect native fish species. The petitioner proposes to allow daily fishing south of the Golden Gate Bridge in all California South Coast Rivers and ocean waters, and suggests increasing the daily bag limit to 3 fish and decreasing the size limit to 12 inches.

#### Department Response

The Department does not support Mr. Lambert's petition to change the striped bass sport fishing regulations because: (1) striped bass are not present in many of the watersheds south of Golden Gate Bridge; (2) the fishing impacts due to bycatch of coho salmon and steelhead during targeting of striped bass outweighs the benefit of the off chance of taking striped bass; (3) invoking a size and bag limit is a management measure and contradictory to the intent of the proposal; (4) steelhead are not allowed to be fished daily during their open season and therefore daily fishing of striped bass would likely have an adverse impact on steelhead and Coho Salmon from increase fishing ; and (5) adoption of the regulation as proposed would create an enforceability issue related to two different standards in different areas of the state.

(b) No Change Alternative:

The no change alternative would leave existing regulations in place.

(c) Consideration of Alternatives:

In view of information currently possessed, no reasonable alternative considered would be more effective in carrying out the purpose for which the regulation is proposed, would be as effective and less burdensome to affected private persons than the proposed regulation, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

V. Mitigation Measures Required by Regulatory Action:

The proposed regulatory action will have no negative impact on the environment; therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action:

The Department assessed the potential for significant statewide adverse economic impacts that might result from the proposed regulatory action, and made the following initial determinations relative to the required statutory categories:

- (a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

The proposed action is not anticipated to have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states because the expected impact of the proposed regulations on the amount of fishing activity is anticipated to be minimal relative to recreational angling effort statewide.

- (b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:

The expected impact of the proposed regulations on the amount of fishing activity is anticipated to be minimal relative to recreational angling effort statewide. Therefore, the Commission does not anticipate any impacts on the creation or elimination of jobs, the creation of new business, the elimination of existing business or the expansion of businesses in California.

The Commission anticipates benefits to the health and welfare of California residents. Sport fishing contributes to increased mental health of its practitioners as fishing is a hobby and form of relaxation for many. Sport fishing also provides opportunities for multi-generational family activities and promotes respect for California's environment by younger generations, the future stewards of California's natural resources.

The Commission does not anticipate any non-monetary benefits to worker safety.

The Commission anticipates benefits to the environment by the sustainable management of California's sport fishing resources.

- (c) Cost Impacts on a Representative Private Person or Business:

The agency is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

- (d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding

to the State:

None.

(e) Nondiscretionary Costs/Savings to Local Agencies:

None.

(f) Programs Mandated on Local Agencies or School Districts:

None.

(g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code:

None.

(h) Effect on Housing Costs:

None.

## VII. Economic Impact Assessment:

The proposed regulations will revise and update inland sport fishing regulations starting in 2019. Currently, the seasons, size limits, and bag and possession limits for sport fishing are periodically reviewed by the California Department of Fish and Wildlife and the California Fish and Game Commission. This set of amendments will clarify that inland waters do not include bays; increase fishing opportunities for black bass in Lake Perris; and make needed editorial corrections.

Inland sport fishing regulations' affected parties include recreational anglers, commercial passenger fishing vessels and a variety of businesses that support anglers. The economic impact of regulatory changes for sport fisheries are estimated by tracking resulting changes in fishing effort, angler trips and length of stay in the fishery areas. Distance traveled affects gas and other travel expenditures. Day trips and overnight trips involve different levels of spending for gas, food and accommodations at area businesses as well as different levels of sales tax impacts. Direct expenditures ripple through the economy, as receiving businesses buy intermediate goods from suppliers that then spend that revenue again. Business spending on wages is received by workers who then spend that income, some of which goes to local businesses. Recreational fisheries spending thus multiplies throughout the economy with the indirect and induced effects of the initial direct expenditure.



This regulatory action may impact businesses that provide services to sport fishermen but these effects are anticipated to range from none to small positive impacts, depending on the regulations ultimately adopted by the Commission. Sport fishing business owners, boat owners, tackle store owners, boat manufacturers, vendors of food, bait, fuel and lodging, and others that provide goods or services to those that sport fish in California may be positively affected to some degree from increases to business that may result under the range of proposed regulations. These anticipated impacts may vary by geographic location. Additionally, economic impacts to these same businesses may result from a number of factors unrelated to the proposed changes to inland sport fishing regulations, including weather, fuel prices, and success rates in other recreational fisheries that compete for angler trips.

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State:

The cumulative effects of the changes statewide are estimated to be neutral to job elimination and potentially positive to job creation in California. No significant changes in fishing effort and sport fishing expenditures to businesses are expected as a direct result of the proposed regulation changes.

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State:

The cumulative effects of the changes statewide are expected to be neutral to business elimination and have potentially positive impacts to the creation of businesses in California. No significant changes in fishing effort and sport fishing expenditures to businesses are expected as a direct result of the proposed regulation changes.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State:

The cumulative effects of the changes statewide are expected to be neutral to positive to the expansion of businesses currently doing business in California. No significant changes in fishing effort and inland sport fishing expenditures to businesses are expected as a direct result of the proposed regulation changes.

(d) Benefits of the Regulation to the Health and Welfare of California Residents:

The Commission anticipates benefits to the health and welfare of California residents. Sport fishing contributes to increased mental health of its practitioners as fishing is a hobby and form of relaxation for many. Sport fishing also provides opportunities for multi-generational family activities and promotes respect for California's environment by younger generations, the future stewards of California's natural resources.

(e) Benefits of the Regulation to Worker Safety:

The proposed regulations are not anticipated to impact worker safety conditions.

(f) Benefits of the Regulation to the State's Environment:

It is the policy of the state to encourage the conservation, maintenance, and utilization of the living resources of the inland waters under the jurisdiction and influence of the state for the benefit of all its citizens and to promote the development of local California fisheries. The objectives of this policy include, but are not limited to, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence and the maintenance of a sufficient resource to support a reasonable sport use, taking into consideration the necessity of regulating individual sport fishery bag limits in the quantity that is sufficient to provide a satisfying sport. Adoption of scientifically-based inland trout and salmon seasons, size limits, and bag and possession limits provides for the maintenance of sufficient populations of trout and salmon to ensure their continued existence.

## **Informative Digest/Policy Statement Overview**

This California Department of Fish and Wildlife (Department) proposal combines Department and public requests for changes to Title 14, California Code of Regulations (CCR), for the Annual Sport Fishing Regulations review cycle. This proposal will clarify that inland waters do not include bays, increase fishing opportunities for black bass in Perris Lake, and make needed corrections to existing regulations. The proposed regulatory changes are needed to reduce public confusion and improve regulatory enforcement.

The Department is proposing the following changes to current regulations:

### **INLAND WATERS DEFINITION**

The current definition of inland waters can be confusing to anglers who want to fish two rods in a bay, but are not sure if a second rod validation is required. A second-rod validation is only required in inland waters. However, the current definition of Inland Waters (Title 14, Section 1.53) is not clear if inland waters include or exclude bays. The definition reads, "Inland waters exclude the waters of San Francisco Bay and the waters of Elkhorn Slough..." The definition only excludes San Francisco Bay. Title 14, Section 27.00, Definition of the Ocean and San Francisco Bay District reads, "The ocean is...the waters of open or enclosed bays contiguous to the ocean." This definition clearly states that all bays are considered waters of the ocean. To be consistent and clear, the definition of inland waters should state that all bays are excluded, not just San Francisco Bay. Amending the definition will clarify that inland waters do not include bays and, therefore, a second rod validation is not required in a bay.

#### Proposal: Amend Section 1.53, Inland Waters

Amend Section 1.53 to clarify that inland waters do not include bays.

### **LAKE PERRIS LARGEMOUTH BASS SIZE AND BAG LIMIT**

The regulations were changed in 2009 to protect the fishery when the lake was drawn down by 43% to repair the dam. The dam repair is to be completed and the water is to be restored to nearly full pool in late 2017. CDFW placed 1,484 brush habitat structures into the remnant lake in 2008-2016 and built 109 rock reefs with approximately 109,000 sq/ft of gravel/cobble rock areas. In addition, once the water levels are restored, 12 years of terrestrial vegetation growth will be available in the littoral zone to help re-establish the bass population negating the need to protect the fishery beyond the statewide standard any further.

#### Proposal: Amend Section 5.00(B)(22), Perris Lake

Restore the black bass regulation at Lake Perris to the statewide standard 5 fish at 12 inches from 2 fish at 15 inches.

**Updates to Authority and Reference Citations Based on Recent Legislation**

Senate Bill 1473 (Stats. 2016, Ch. 546) made organizational changes to the Fish and Game Code that became effective January 1, 2017. The changes included moving the Commission's exemptions from specified Administrative Procedure Act time frames from Section 202 to Section 265 of the Fish and Game Code, moving the Commission's effective date procedures from Section 215 to Section 270 of the Fish and Game Code, moving the Commission's effective period procedures from Section 220 to Section 275 of the Fish and Game Code, and moving the Commission's authority to adopt emergency regulations from Section 240 to Section 399 of the Fish and Game Code. In accordance with these changes to the Fish and Game Code, sections 202, 215, and 220 are removed from, and sections 265, 270, and 275 are added to, the authority and reference citations for this rulemaking.

**Minor Editorial Corrections for Clarity**

In addition to the above proposals, minor editorial corrections are proposed to correct typographical errors and to improve regulation clarity.

**Benefits of the Proposed Regulations**

It is the policy of this state to encourage the conservation, maintenance, and utilization of the living resources of the ocean and inland waters under the jurisdiction and influence of the state for the benefit of all the citizens of the State. In addition, it is the policy of this state to promote the development of local California fisheries in harmony with federal law respecting fishing and the conservation of the living resources of the ocean and inland waters under the jurisdiction and influence of the State. The objectives of this policy include, but are not limited to, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence and the maintenance of a sufficient resource to support a reasonable sport use. Adoption of scientifically-based trout and salmon seasons, size limits, and bag and possession limits provides for the maintenance of sufficient populations of trout and salmon to ensure their continued existence.

The benefits of the proposed regulations are concurrence with Federal law, sustainable management of California's trout and salmon resources, and promotion of businesses that rely on recreational sport fishing in California.

## Regulatory Language

### Section 1.53, Title 14, CCR, is amended as follows:

#### § 1.53. Inland Waters.

Inland waters are all the fresh, brackish and inland saline waters of the state, including lagoons and tidewaters upstream from the mouths of coastal rivers and streams. Inland waters exclude open or enclosed bays contiguous to the ocean including the waters of San Francisco Bay and the waters of Elkhorn Slough, west of Elkhorn Road between Castroville and Watsonville. See Section 27.00 for the description of San Francisco Bay.

Note: Authority cited: Sections 200, ~~202~~, 205, ~~215~~ and ~~220~~ 265 and 270, Fish and Game Code. Reference: Sections 200, ~~202~~, 205, ~~215~~ and ~~220~~ 265 and 270, Fish and Game Code.

### Section 5.00, Title 14, CCR, is amended as follows:

#### § 5.00. Black Bass.

It is unlawful to take or possess black bass except as provided below:

(Note: Some waters are closed to all fishing under Section 7.50.)

*[No change to subsection (a)]*

(b) Special Regulations: Counties and individual waters listed below are those having regulations different from the General Statewide Restrictions in subsection (a).

<i>Area or Body of Water</i>	<i>Open Season</i>	<i>Size (total length)</i>	<i>Bag Limit</i>
DISTRICTS AND COUNTIES WITH SPECIAL REGULATIONS			
<i>[No change to subsections (b)(1) through (b)(21)]</i>			
(22) Perris Lake (Riverside County).	All year.	<del>15-inch minimum.</del> <u>12 inch minimum.</u>	<del>2</del> <u>5</u>
<i>[No change to subsections (b)(23) through (b)(30)]</i>			

Note: Authority cited: Sections 200, ~~202~~, 205, ~~215~~ and ~~220~~ 265, 270 and 275, Fish and Game Code. Reference: Sections 200, ~~and 205~~ and ~~206~~, Fish and Game Code.

STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION  
(Pre-publication of Notice Statement)

Amend Sections 1.74  
Title 14, California Code of Regulations  
Re: Annual Sport Fishing Regulations - Sport Fishing Report Card Requirements

- I. Date of Initial Statement of Reasons: March 16, 2018
- II. Dates and Locations of Scheduled Hearings:
- (a) Notice Hearing: Date: August 23, 2018  
Location: Fortuna
- (b) Discussion Hearing: Date: October 18, 2018  
Location: Fresno
- (c) Adoption Hearing: Date: December 13, 2018  
Location: Oceanside

III. Description of Regulatory Action:

- (a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

This California Department of Fish and Wildlife (Department) proposal requests changes to Title 14, California Code of Regulations (CCR), for the Annual Sport Fishing Regulations review cycle. Existing regulations established guidelines for report card regulations including the need for reporting harvest authorized by a report card; however, this section does not include the same mechanism for confirmation that data from a report card has been reported. This proposal requires report card holders who submit data online to write the provided confirmation number on their report card and retain the report card until for 90 days after the reporting deadline, in the same way it is regulated with other types of report cards in Title 14. The proposed regulatory changes are needed to reduce public confusion, improve the accuracy of data collected, and improve regulatory enforcement.

The Department is proposing the following changes to current regulations:

**SPORT FISHING REPORT CARD REQUIREMENTS**

Section 1.74 establishes guidelines for report card regulations including reporting harvest authorized by a report card; however, this section does not include a mechanism for confirmation that data from a report card has been reported. This proposal requires report card holders who submit data online to write the



provided confirmation number on their report card and retain the report card until 90 days after the reporting deadline. The objectives of this proposed regulations are to:

- Ensure continued fishing opportunities for anglers in California by providing the Department with more timely, accurate and comprehensive data on success and take levels;
- Establish a retention period of 90 days, during which time the Department may request the angler surrender the report card to audit the reporting process;
- Establish consistency with other report card procedures that include a 90 day retention period.

When a report card is lost, a licensee may wish to obtain a replacement report card, or may simply need to fulfill the harvest reporting requirement before the reporting deadline. Section 1.74 does not currently provide guidelines for licensees who have lost their report card and need to report their harvest, but do not need to obtain a replacement report card. This proposal updates procedures regarding lost report cards to provide guidelines for obtaining a replacement report card, and also for reporting harvest from a lost report card without obtaining a replacement report card.

Proposal: Amend Section 1.74, Sport Fishing Report Card Requirements

Amend Section 1.74 to update procedures for reporting online and for lost report cards.

**Minor Editorial Corrections for Clarity**

In addition to the above proposals, minor editorial corrections are proposed to correct typographical errors and to improve regulation clarity.

**Benefits of the Proposed Regulations**

It is the policy of this state to encourage the conservation, maintenance, and utilization of the living resources of the ocean and inland waters under the jurisdiction and influence of the state for the benefit of all the citizens of the State. In addition, it is the policy of this state to promote the development of local California fisheries in harmony with federal law respecting fishing and the conservation of the living resources of the ocean and inland waters under the jurisdiction and influence of the State. The objectives of this policy is to ensure more accurate data reporting as well as a mechanism to audit the data reported. Adoption of scientifically-based trout and salmon seasons, size limits, and bag and possession limits provides for the maintenance of sufficient populations of trout and salmon to ensure their continued existence, and verifiable accuracy of the data will further help to improve the fisheries impacted by this action.

The benefits of the proposed regulations are concurrence with Federal law, sustainable management of California's trout and salmon resources, and promotion of businesses that rely on recreational sport fishing in California.

- (b) Authority and Reference Sections from Fish and Game Code for Regulation:

Authority: Sections 200, 205, 265, 270, 275, 1050, 1053.1, 1055.1, 7380 and 8491, Fish and Game Code.

Reference: Sections 110, 200, 205, 255, 265, 270, 275, 713, 1050, 1053.1, 1055.1, 7149.8, 7380, 7381, and 7382, Fish and Game Code.

- (c) Specific Technology or Equipment Required by Regulatory Change:

None.

- (d) Identification of Reports or Documents Supporting Regulation Change:

None.

- (e) Public Discussions of Proposed Regulations Prior to Notice Publication:

No public meetings are scheduled prior to the notice publication. The 45-day public notice comment period provides adequate time for review of the proposed changes.

IV. Description of Reasonable Alternatives to Regulatory Action:

- (a) Alternatives to Regulation Change:

No alternative were identified.

- (b) No Change Alternative:

The no change alternative would leave existing regulations in place.

- (c) Consideration of Alternatives:

In view of information currently possessed, no reasonable alternative considered would be more effective in carrying out the purpose for which the regulation is proposed, would be as effective and less burdensome to affected private persons than the proposed regulation, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

V. Mitigation Measures Required by Regulatory Action:

The proposed regulatory action will have no negative impact on the environment; therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action:

The Department assessed the potential for significant statewide adverse economic impacts that might result from the proposed regulatory action, and made the following initial determinations relative to the required statutory categories:

- (a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

The proposed action is not anticipated to have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states because the proposed action is a procedural update to an existing report card process. No changes in fishing effort and sport fishing expenditures to businesses are expected as a result of the proposed regulation changes.

- (b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:

The effects of the proposed action are anticipated to be neutral to the creation or elimination of jobs, the creation of new businesses, the elimination of existing businesses or the expansion of businesses in California. The proposed action is a procedural update to an existing report card process. No changes in fishing effort and sport fishing expenditures to businesses are expected as a result of the proposed regulation changes.

The Commission does not anticipate any impacts to the health and welfare of California residents from the proposed action.

The Commission does not anticipate any non-monetary benefits to worker safety.

The Commission does not anticipate any benefits to the environment from the proposed action.

- (c) Cost Impacts on a Representative Private Person or Business:

The agency is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

- (d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State:

None.

- (e) Nondiscretionary Costs/Savings to Local Agencies:

None.

- (f) Programs Mandated on Local Agencies or School Districts:

None.

- (g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code:

None.

- (h) Effect on Housing Costs:

None.

VII. Economic Impact Assessment:

The proposed regulations will provide an update for a confirmation procedure for the submission of sport fishing report cards and will correct some text errors.

- (a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State:

The effects of the proposed action are anticipated to be neutral to the creation or elimination of jobs within the state. The proposed action is a procedural update to an existing report card process. No changes in fishing effort and sport fishing expenditures to businesses are expected as a result of the proposed regulation changes.

- (b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State:

The effects of the proposed action are anticipated to be neutral to the creation or elimination of businesses within the state. The proposed action is a procedural update to an existing report card process. No changes in fishing effort and sport fishing expenditures to businesses are expected as a result of the proposed regulation changes.

- (c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State:

The effects of the proposed action are anticipated to be neutral to the expansion of businesses currently doing business within the state. The proposed action is a procedural update to an existing report card process. No changes in fishing effort and sport fishing expenditures to businesses are expected as a result of the proposed regulation changes.

- (d) Benefits of the Regulation to the Health and Welfare of California Residents:

The proposed action is not anticipated to impact the health and welfare of California residents.

- (e) Benefits of the Regulation to Worker Safety:

The proposed action is not anticipated to impact worker safety conditions.

- (f) Benefits of the Regulation to the State's Environment:

The proposed action is not anticipated to provide any benefits to the state's environment.

## **Informative Digest/Policy Statement Overview**

This California Department of Fish and Wildlife (Department) proposal requests changes to Title 14, California Code of Regulations (CCR), for the Annual Sport Fishing Regulations review cycle. This proposal will update the sport fishing report card requirements, and make needed corrections to existing regulations. The proposed regulatory changes are needed to reduce public confusion and improve regulatory enforcement.

The Department is proposing the following changes to current regulations:

### **SPORT FISHING REPORT CARD REQUIREMENTS**

Section 1.74 establishes guidelines for report card regulations including reporting harvest authorized by a report card; however, this section does not include a mechanism for confirmation that data from a report card has been reported. This proposal requires report card holders who submit data online to write the provided confirmation number on their report card and retain the report card until 90 days after the reporting deadline.

When a report card is lost, a licensee may wish to obtain a replacement report card, or may simply need to fulfill the harvest reporting requirement before the reporting deadline. Section 1.74 does not currently provide guidelines for licensees who have lost their report card and need to report their harvest, but do not need to obtain a replacement report card. This proposal updates procedures regarding lost report cards to provide guidelines for obtaining a replacement report card, and also for reporting harvest from a lost report card without obtaining a replacement report card.

#### **Proposal: Amend Section 1.74, Sport Fishing Report Card Requirements**

Amend Section 1.74 to update procedures for reporting online and for lost report cards.

### **Benefits of the Proposed Regulations**

It is the policy of this state to encourage the conservation, maintenance, and utilization of the living resources of the ocean and inland waters under the jurisdiction and influence of the state for the benefit of all the citizens of the State. In addition, it is the policy of this state to promote the development of local California fisheries in harmony with federal law respecting fishing and the conservation of the living resources of the ocean and inland waters under the jurisdiction and influence of the State. The objectives of this policy include, but are not limited to, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence and the maintenance of a sufficient resource to support a reasonable sport use. Adoption of scientifically-based trout and salmon seasons, size limits, and bag and possession limits provides for the maintenance of sufficient populations of trout and salmon to ensure their continued existence.

The benefits of the proposed regulations are concurrence with Federal law, sustainable management of California's trout and salmon resources, and promotion of businesses that rely on recreational sport fishing in California.



## **Regulatory Language**

### **Section 1.74, Title 14, CCR, is amended as follows:**

#### **§ 1.74. Sport Fishing Report Card Requirements.**

(a) Purpose. These regulations are designed to improve recreational fishing effort and catch information in some or all areas where the fisheries operate. Many of these species are of high commercial value, and therefore, additional enforcement mechanisms are needed to improve compliance with existing bag limits and other regulations, and to reduce the potential for poaching.

(b) Report card requirements apply to any person fishing for or taking the following species regardless of whether a sport fishing license is required:

(1) Salmon, in the anadromous waters of the Klamath, Trinity, and Smith river basins. Anadromous waters are defined in Section 1.04 of these regulations.

(2) Steelhead trout.

(3) White sturgeon.

(4) Red abalone.

(5) California spiny lobster.

(c) General Report Card Requirements.

(1) Any person fishing for or taking any of the species identified in this Section shall have in his immediate possession a valid non-transferable report card issued by the department for the particular species. See special exemption regarding possession of report cards for lobster divers in Section 29.91 of these regulations.

(2) All entries made on any report card or tag shall be legible and in indelible ink.

(3) A report card holder fishing with a one, two, or ten-day sport fishing license, may replace the expired fishing license without purchasing a new report card so long as the report card is still valid.

(4) Report cards are not transferable and shall not be transferred to another person. No person shall possess any report card other than his own.

(5) A person may only obtain one abalone report card and one sturgeon report card per report card period.

(6) Any report card holder who fills in all available lines on his steelhead, salmon or lobster report card shall return or report the card to the department pursuant to subsection 1.74(e) prior to purchasing a second card.

(7) Data recording and tagging procedures vary between report cards and species. See specific regulations in sections 5.79, 5.87, 5.88, 27.92, 29.16, and 29.91 that apply in addition to the regulations of this Section.

(d) Report Card Return and Reporting Requirements

(1) Report card holders shall return or report their salmon, steelhead, sturgeon, or abalone report cards to the department pursuant to subsection 1.74(e) by January 31 of the following year.

(A) Any report card holder who fails to return or report his salmon, steelhead, sturgeon, or abalone report card to the department by the deadline may be restricted from obtaining the same card in a subsequent license year or may be subject to an additional fee for the issuance of the same card in a subsequent license year.

(2) Report card holders shall return or report their lobster report cards pursuant to subsection 1.74(e) by April 30 following the close of the lobster season for which the card was issued.

(A) Any report card holder who fails to return or report his or her lobster report card by April 30 following the close of the lobster season specified on the card shall be subject to a nonrefundable non-return fee specified in Section 701, in addition to the annual report card fee, for the issuance of a lobster report card in the subsequent fishing season.

(e) Report Card Return and Reporting Mechanisms:

(1) By mail or in person at the address specified on the card. A report card returned by mail shall be postmarked by the date applicable to that card as specified in subsection 1.74(d)(1) or 1.74(d)(2).

(2) Online through the department's license sales service website by the date applicable to that card as specified in subsection 1.74(d)(1) or 1.74(d)(2).

Report card holders reporting online will be provided a confirmation number upon successful submission. The report card holder must record the provided confirmation number in the space provided on the report card and retain the report card for 90 days after the reporting deadline. Report cards submitted online must be surrendered to the department upon demand.

(3) If a report card is submitted by mail and not received by the department, it is considered not returned unless the report card holder reports his or her report card as lost pursuant to subsection 1.74(f).

~~(f) Lost report cards.~~

~~(1) Any report card holder who loses his report card shall submit an affidavit, signed under penalty of perjury, in person to a department license sales office containing all of the following information:~~

~~(A) A statement containing the report card holder's full name confirming that the originally issued report card cannot be recovered.~~

~~(B) A statement containing the report card holder's best recollection of the prior catch records that were entered on the report card that was lost.~~

~~(C) A statement describing the factual circumstances surrounding the loss of the card.~~

~~(2) An affidavit for a lost report card shall be presented at a department license sales office, by the date applicable to that card specified in subsection 1.74(d)(1) or 1.74(d)(2) to be considered returned.~~

~~(3) Notwithstanding subsection 1.74(c)(5), any report card holder who loses his report card during the period for which it is valid may replace the lost report card by submitting an affidavit as described in subsection 1.74(f)(1) and payment of the report card fee and replacement processing fee specified in Section 701.~~

(A) Based on the information provided in the written affidavit for abalone and sturgeon report cards, the department shall issue only the number of tags that were reported unused on the previously issued report card.

(f) Lost report cards.

(1) Lobster, salmon, and steelhead. Notwithstanding subsection 1.74(c)(5), any report card holder who loses his report card during the report card period for which it is valid may purchase an additional report card by submitting payment to an authorized license agent or department license sales office. Catch information from the lost report card shall not be transferred to the new card. Information from lost lobster, salmon, and steelhead report cards shall be reported as specified in subsection 1.74(f)(3).

(2) Abalone and sturgeon. Notwithstanding subsection 1.74(c)(5), any report card holder who loses his or her report card during the period for which it is valid may purchase a replacement report card. The Department may issue a replacement report card for abalone and sturgeon upon completion of the following:

(A) Submitting an affidavit to any department license sales office containing all the information specified in subsection 1.74(f)(3)(B); and

(B) Submitting payment of the report card fee and the non-refundable replacement-processing fee specified in Section 701.

(C) Department staff shall enter the harvest information from the affidavit to the replacement report card.

(D) Based on the information provided on the affidavit, department staff shall remove tags reported as used and issue only the number of tags that were reported as unused on the lost original report card.

(E) Report card holders shall verify that the harvest information has been accurately transferred from the affidavit to his or her replacement report card.

(F) The replacement report card shall be reported pursuant to the requirement for the original report card as specified in subsection 1.74(d). Note: the original report card should not be reported.

(3) Reporting requirements. Except for lost abalone and sturgeon report cards for which a replacement card was purchased, all lost report cards shall be reported by the harvest report submission deadline date applicable to that card as specified in subsection 1.74(d)(1) or 1.74(d)(2) by one of the following methods:

(A) Online through the department's license sales service website; or

(B) Submitting an affidavit, signed under penalty of perjury, to a department license sales office containing the following information:

1. The report card holder's full name, GO ID#, and a statement confirming that the originally-issued report card is lost and cannot be recovered.

2. A statement containing the report card holder's best recollection of the prior catch records that were entered on the report card that was lost.

3. A statement describing the factual circumstances surrounding the loss of the report card.

Note: Authority cited: Sections 200, 205, 265, 275, 1050, 1053.1, 1055.1 and 7380, Fish and Game Code. Reference: Sections 110, 200, 205, 265, 275, 713, 1050, 1053.1, 1055.1, 7149.8, 7380, 7381 and 7382, Fish and Game Code.

2018 JUL 11 AM 9:30

## Memorandum

Date: July 9, 2018

To: Valerie Termini  
Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Initial Statement of Reasons for Amendments to the Annual Sport Fishing Regulations**

- o Attached please find the Initial Statement of Reasons to amend section 1.74, Title 14, California Code of Regulations; and
- o Attached please find the Initial Statement of Reasons to amend sections 1.53 and 5.00, Title 14, California Code of Regulations.

If you have any questions regarding this item, please contact Kevin Shaffer, Chief, Fisheries Branch, at (916) 327-8841 or by e-mail at [Kevin.Shaffer@wildlife.ca.gov](mailto:Kevin.Shaffer@wildlife.ca.gov).

Attachment

cc: Stafford Lehr, Deputy Director  
Wildlife and Fisheries Division  
[stafford.lehr@wildlife.ca.gov](mailto:stafford.lehr@wildlife.ca.gov)

Kevin Shaffer, Chief  
Fisheries Branch  
[kevin.shaffer@wildlife.ca.gov](mailto:kevin.shaffer@wildlife.ca.gov)

Michelle Selmon, Program Manager  
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Roger Bloom, Program Manager  
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Karen Mitchell  
Fisheries Branch  
Senior Environmental Scientist (Specialist)  
[karen.mitchell@wildlife.ca.gov](mailto:karen.mitchell@wildlife.ca.gov)

CALIFORNIA FISH AND GAME COMMISSION  
RESOLUTION HONORING

# Dr. Mickey E. Heitmeyer

**WHEREAS**, the Waterfowler's Hall of Fame was established in 2006 to recognize those individuals who have made significant contributions to enhancing waterfowl and their habitats in California; and

**WHEREAS**, many wildlife professionals, have dedicated their life's work to management and research to conserve waterfowl and their habitats; and

**WHEREAS**, many sportsmen and other conservationists have served a critical role in conserving our waterfowl resource by preserving, restoring, and enhancing natural habitats, managing agricultural habitats with wildlife in mind, and implementing other land uses specifically designed to benefit the waterfowl resource; and

**WHEREAS**, some sportsmen and other conservationists have significantly benefited the waterfowl resource by advocating legislation and other policies that provide needed resources for nesting and wintering waterfowl populations;

**NOW THEREFORE, BE IT RESOLVED**, that the California Fish and Game Commission hereby recognizes the addition of Dr. Mickey E. Heitmeyer to the Waterfowler's Hall of Fame.

**FURTHER, BE IT RESOLVED**, that the California Fish and Game Commission recognizes Dr. Heitmeyer's substantial contributions as a scientist and education leader in waterfowl ecology and management. He was one of the first waterfowl biologists to champion the importance of waterfowl body condition in winter for their subsequent reproductive success on northern breeding grounds. Dr. Heitmeyer pioneered the use of energetic-based management for determining the quantities and qualities of habitat needed in California to sustain wintering waterfowl numbers and distribution necessary for waterfowl hunting and conservation. He was also instrumental in establishing bridges between wetland managers and rice growers that led to unprecedented cooperation between the agriculture and conservation communities. Dr. Heitmeyer's charismatic personality and exceptional oratory skills propelled him to leadership roles at both California Waterfowl and Ducks Unlimited, where he inspired cooperation among state, federal and private entities to work toward common goals for waterfowl, wetlands and wildlife-friendly agriculture throughout California.

**FINALLY, BE IT RESOLVED**, that the California Fish and Game Commission further recognizes that Dr. Heitmeyer's passion and knowledge was critical in developing science-based management for conserving waterfowl and their habitats in California.

**DATED: OCTOBER 17, 2018**

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Eric Sklar, President

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Anthony C. Williams, Vice President

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Jacque Hostler-Carmesin, Member

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Russell Burns, Member

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Peter Silva, Member

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Melissa Miller-Henson, Acting  
Executive Director



CALIFORNIA FISH AND GAME COMMISSION  
RESOLUTION HONORING

# Jeff Kerry

**WHEREAS**, the Waterfowler's Hall of Fame was established in 2006 to recognize those individuals who have made significant contributions to enhancing waterfowl and their habitats in California; and

**WHEREAS**, many wildlife professionals, have dedicated their life's work to management and research to conserve waterfowl and their habitats; and

**WHEREAS**, many sportsmen and other conservationists have served a critical role in conserving our waterfowl resource by preserving, restoring, and enhancing natural habitats, managing agricultural habitats with wildlife in mind, and implementing other land uses specifically designed to benefit the waterfowl resource; and

**WHEREAS**, some sportsmen and other conservationists have significantly benefited the waterfowl resource by advocating legislation and other policies that provide needed resources for nesting and wintering waterfowl populations;

**NOW THEREFORE, BE IT RESOLVED**, that the California Fish and Game Commission hereby recognizes the addition of Jeff Kerry to the Waterfowler's Hall of Fame.

**FURTHER, BE IT RESOLVED**, that the California Fish and Game Commission recognizes Mr. Kerry as a lifelong hunter and conservationist who represents one of the strongest voices in wetland conservation. Mr. Kerry has served on the boards of the Grassland Resource Conservation District, the Grassland Water District and California Waterfowl. He is an expert on moist-soil management, and he has testified before Congress about the critical importance of Central Valley Project Improvement Act water for the long-term health of grasslands.

**FINALLY, BE IT RESOLVED**, that the California Fish and Game Commission further recognizes Mr. Kerry's understanding of the importance of the waterfowl hunter in providing funding for wetland restoration and protection. That knowledge has played a critical role in the state and federal wildlife agencies appropriating much-needed resources for the long-term protection of grasslands through acquisition of state and federal refuges and wildlife easements on private wetlands habitat.

**DATED: OCTOBER 17, 2018**

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Eric Sklar, President

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Anthony C. Williams, Vice President

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Jacque Hostler-Carmesin, Member

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Russell Burns, Member

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Peter Silva, Member

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Melissa Miller-Henson, Acting  
Executive Director

CALIFORNIA FISH AND GAME COMMISSION  
RESOLUTION HONORING

# Peter Ottesen

**WHEREAS**, the Waterfowler's Hall of Fame was established in 2006 to recognize those individuals who have made significant contributions to enhancing waterfowl and their habitats in California; and

**WHEREAS**, many wildlife professionals, have dedicated their life's work to management and research to conserve waterfowl and their habitats; and

**WHEREAS**, many sportsmen and other conservationists have served a critical role in conserving our waterfowl resource by preserving, restoring, and enhancing natural habitats, managing agricultural habitats with wildlife in mind, and implementing other land uses specifically designed to benefit the waterfowl resource; and

**WHEREAS**, some sportsmen and other conservationists have significantly benefited the waterfowl resource by advocating legislation and other policies that provide needed resources for nesting and wintering waterfowl populations;

**NOW THEREFORE, BE IT RESOLVED**, that the California Fish and Game Commission hereby recognizes the addition of Peter Ottesen to the Waterfowler's Hall of Fame.

**FURTHER, BE IT RESOLVED**, that the California Fish and Game Commission recognizes Mr. Ottesen as an award-winning outdoor writer who, for more than four decades, has produced columns, news stories and photographs about the conservation of wetlands and waterfowl for major daily newspapers, magazines and television documentaries. Mr. Ottesen was a founder of the Outdoor Writers Association of California and was the recipient of the organization's 1995 coveted Writer of the Year award. He has written numerous published articles and is an accomplished author.

**FINALLY, BE IT RESOLVED**, that the California Fish and Game Commission further recognizes Mr. Ottesen's commitment to the state's natural resources as a partner owning more than 2,800 acres of Central Valley and Delta wetlands and uplands – all dedicated as habitat in perpetuity – to benefit more than 350 species of wildlife. He is a trustee for Reclamation District No. 2041, a Bronze Benefactor and former board member of California Waterfowl, a member of The Brotherhood of St. Hubertus, and a Benefactor and Grand Slam Life Sponsor of Ducks Unlimited.

**DATED: OCTOBER 17, 2018**

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Eric Sklar, President

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Anthony C. Williams, Vice President

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Jacque Hostler-Carmesin, Member

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Russell Burns, Member

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Peter Silva, Member

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Melissa Miller-Henson, Acting  
Executive Director



CALIFORNIA FISH AND GAME COMMISSION  
RESOLUTION HONORING

# Thomas Quinn

**WHEREAS**, the Waterfowler's Hall of Fame was established in 2006 to recognize those individuals who have made significant contributions to enhancing waterfowl and their habitats in California; and

**WHEREAS**, many wildlife professionals, have dedicated their life's work to management and research to conserve waterfowl and their habitats; and

**WHEREAS**, many sportsmen and other conservationists have served a critical role in conserving our waterfowl resource by preserving, restoring, and enhancing natural habitats, managing agricultural habitats with wildlife in mind, and implementing other land uses specifically designed to benefit the waterfowl resource; and

**WHEREAS**, some sportsmen and other conservationists have significantly benefited the waterfowl resource by advocating legislation and other policies that provide needed resources for nesting and wintering waterfowl populations;

**NOW THEREFORE, BE IT RESOLVED**, that the California Fish and Game Commission hereby recognizes the addition of Thomas Quinn to the Waterfowler's Hall of Fame.

**FURTHER, BE IT RESOLVED**, that the California Fish and Game Commission recognizes Mr. Quinn as a distinguished and respected wildlife artist, successful dog breeder and trainer, field trialer and author. With his great interest in dog training, he went on to write "The Working Retriever," which presented a unique philosophy on the care and handling of both hunting and field trial dogs. His watercolor paintings reveal a deep understanding of wild animals and their natural habitats.

**FINALLY, BE IT RESOLVED**, that the California Fish and Game Commission further recognizes Mr. Quinn's commitment to conservation as evidenced through his support of both California Waterfowl and Ducks Unlimited. His generous support to numerous conservation efforts reaches beyond California, extending as far as the Netherlands and Spain. Mr. Quinn's long career spans many generations and, through his art, hunters and conservationists will treasure his work for decades to come.

**DATED: OCTOBER 17, 2018**

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Eric Sklar, President

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Anthony C. Williams, Vice President

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Jacque Hostler-Carmesin, Member

---

Russell Burns, Member

---

Peter Silva, Member

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Melissa Miller-Henson, Acting  
Executive Director

CALIFORNIA FISH AND GAME COMMISSION  
RESOLUTION HONORING

# Mark Gregory Steidlmayer

**WHEREAS**, the Waterfowler's Hall of Fame was established in 2006 to recognize those individuals who have made significant contributions to enhancing waterfowl and their habitats in California; and

**WHEREAS**, many wildlife professionals, have dedicated their life's work to management and research to conserve waterfowl and their habitats; and

**WHEREAS**, many sportsmen and other conservationists have served a critical role in conserving our waterfowl resource by preserving, restoring, and enhancing natural habitats, managing agricultural habitats with wildlife in mind, and implementing other land uses specifically designed to benefit the waterfowl resource; and

**WHEREAS**, some sportsmen and other conservationists have significantly benefited the waterfowl resource by advocating legislation and other policies that provide needed resources for nesting and wintering waterfowl populations;

**NOW THEREFORE, BE IT RESOLVED**, that the California Fish and Game Commission hereby recognizes the addition of the late Mark Gregory Steidlmayer to the Waterfowler's Hall of Fame.

**FURTHER, BE IT RESOLVED**, that the California Fish and Game Commission recognizes Mr. Steidlmayer as a lifelong advocate not only for the water and property rights of private land owners, but also for the need to provide more public hunting opportunity. In addition to providing leadership to waterfowl clubs he belonged to, Mr. Steidlmayer also used his knowledge and talents to establish a number of progressively-managed wildlife properties.

**FINALLY, BE IT RESOLVED**, that the California Fish and Game Commission further recognizes Mr. Steidlmayer's commitment for assembling monetary resources for Colusa National Wildlife Refuge and negotiating for its expansion multiple times; Mr. Steidlmayer's persistence, knowledge and trust of the various private and public partners made this all possible.

**DATED: OCTOBER 17, 2018**

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Eric Sklar, President

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Anthony C. Williams, Vice President

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Jacque Hostler-Carmesin, Member

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Russell Burns, Member

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Peter Silva, Member

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Melissa Miller-Henson, Acting  
Executive Director



CALIFORNIA FISH AND GAME COMMISSION  
RESOLUTION HONORING

# Peter Stent

**WHEREAS**, the Waterfowler's Hall of Fame was established in 2006 to recognize those individuals who have made significant contributions to enhancing waterfowl and their habitats in California; and

**WHEREAS**, many wildlife professionals, have dedicated their life's work to management and research to conserve waterfowl and their habitats; and

**WHEREAS**, many sportsmen and other conservationists have served a critical role in conserving our waterfowl resource by preserving, restoring, and enhancing natural habitats, managing agricultural habitats with wildlife in mind, and implementing other land uses specifically designed to benefit the waterfowl resource; and

**WHEREAS**, some sportsmen and other conservationists have significantly benefited the waterfowl resource by advocating legislation and other policies that provide needed resources for nesting and wintering waterfowl populations;

**NOW THEREFORE, BE IT RESOLVED**, that the California Fish and Game Commission hereby recognizes the addition of Peter Stent to the Waterfowler's Hall of Fame.

**FURTHER, BE IT RESOLVED**, that the California Fish and Game Commission recognizes Mr. Stent for demonstrating cutting-edge habitat restoration and wildlife management techniques at a number of showcase properties. Mr. Stent spearheaded creation of the Dennis G. Raveling Endowed Waterfowl Professorship at UC Davis, and then engaged Dr. John M. Eadie, the Raveling Chair, and his students to do extensive research on – among other topics – waterfowl foods in the face of limited water availability. He has also served on the board of directors of the National Audubon Society and California Waterfowl.

**FINALLY, BE IT RESOLVED**, that the California Fish and Game Commission further recognizes that Mr. Stent was the founder and publisher of the online newsletter MAD Duck, which focused on waterfowl conservation and held strong views supporting voluntary restraint and raising questions about the waterfowl hunting season continuing after breeding pairs were formed. Mr. Stent wants hunters, who are a small minority in the state, to do the right thing when hunting so they are seen as a positive force for conservation.

**DATED: OCTOBER 17, 2018**

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Eric Sklar, President

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Anthony C. Williams, Vice President

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Jacque Hostler-Carmesin, Member

---

Russell Burns, Member

---

Peter Silva, Member

---

Melissa Miller-Henson, Acting  
Executive Director



California Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
Director's Office  
P.O. Box 944209  
Sacramento, California 94244-2090  
(916) 653-4094  
<http://www.wildlife.ca.gov>

EDMUND G. BROWN, JR., Governor  
CHARLTON H. BONHAM, Director



July 25, 2018

Mr. Jon Warren  
[REDACTED] Lane  
Anderson, CA 96007

Dear Mr. Warren:

**SUBJECT: JERUSALEM CREEK RANCH PLM LICENSE TERMINATION**

As you may be aware, the California Department of Fish and Wildlife (Department) issued a citation and investigated violations of the Fish and Game Code that occurred on and near the Jerusalem Creek Ranch Private Lands Management Area (PLM) on September 9 and 10, 2017. The Department was notified on September 9, 2017 of hunter trespass on a property adjacent to the Jerusalem Creek Ranch PLM. A Wildlife Officer responded where he found and made contact with an individual who was accessing Jerusalem Creek Ranch PLM through the neighbor's property and doing some work on Jerusalem Creek Ranch PLM. This individual was cited for hunter trespass (Section 2016, Fish and Game Code). In addition, wildlife bait was found in the back of the violator's truck. The Wildlife Officer returned to the area and inspected Jerusalem Creek Ranch PLM on September 10, 2017 for additional information. This visit revealed numerous active bait sites within the PLM property with salt blocks, feeders, cameras, grain, and antler growth supplements on the ground. A large storage container with 25 bags of Grainland Select Premium Feed Grains, and 68 bags of Purina Antler Max was also found on the property.

After the investigation, the Department recommended prosecution of the violator for the additional violation of knowingly feeding big game mammals (Section 251.3, Title 14, California Code of Regulations (CCR)). Your 2017 Private Lands Management License, item 3 under Licensee Responsibilities, provides that you must ensure compliance with all hunting regulations and procedures, and the PLM is responsible for violations that occur on the property. The presence of active bait stations on your property are clear violations of hunting regulations and your PLM License. CCR Title 14 section 601(e) authorizes the Director to temporarily suspend the license for any breach or violation of the terms of the license.

Pursuant to this authority, I am hereby temporarily suspending the Jerusalem Creek Ranch PLM License. Consistent with Title 14 section 601(e), the Department will notify the Fish and Game Commission (Commission) and ask the Commission to revoke the Jerusalem Creek Ranch PLM License. The Commission meeting date for this item has not yet been determined. Once the item is scheduled, you will receive

*Conserving California's Wildlife Since 1870*



Mr. Jon Warren  
July 25, 2018  
Page 2

notification by mail in advance of the meeting and may attend in person to contest our recommendation.

If you have any questions or need further information, please contact the Department's PLM Coordinator, Ms. Victoria Barr at (916) 445-4034.

Sincerely,



Charlton H. Bonham  
Director

ec: Department of Fish and Wildlife

Stafford Lehr, Deputy Director  
Wildlife and Fisheries Division  
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Victoria Barr, PLM Coordinator  
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Jeff Stoddard, Program Manager  
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[Jeffrey.Stoddard@wildlife.ca.gov](mailto:Jeffrey.Stoddard@wildlife.ca.gov)

cc's continued on Page 3

Mr. Jon Warren

July 25, 2018

Page 3

Pete Figura, Senior Environmental Scientist, Supervisor  
Northern Region

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Jennifer Carlson, Environmental Scientist  
Northern Region

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Patrick Sater, Environmental Scientist  
Northern Region

[Patrick.Sater@wildlife.ca.gov](mailto:Patrick.Sater@wildlife.ca.gov)

2018 OCT -2 AM 10:30

## Memorandum

Date: October 2, 2018

To: Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Agenda Item for the October 17-18 Fish and Game Commission Meeting – Private Lands Wildlife Habitat Enhancement and Management (PLM) Area License Termination for Jerusalem Creek Ranch**

The Department recommends permanent revocation of the Jerusalem Creek Ranch Private Lands Management (PLM) license.

The PLM program has been in existence since 1981, and over 1,200,000 acres on over 100 properties have been enrolled. A PLM "is an area of private lands for which the landowner or their designee (hereafter referred to as licensee) has completed and implemented a wildlife habitat enhancement and management plan that actively encourages the propagation, conservation and wise use of the fish and wildlife populations on their land" (CCR Title 14 Section 601). Thousands of site-specific habitat enhancement projects have been completed, and the Fish and Game Commission (Commission) has authorized special hunting privileges, some of which are sold to provide an income source and funding for the habitat improvements. The PLM program was controversial at its beginning but has become a success due to the high compliance with annual habitat enhancements required in annual licenses as well as compliance by operators with all wildlife conservation laws and regulations.

The authority for the PLM program is Fish and Game Code (FGC) sections 3400-3408, and the Commission has adopted a specific regulation in Title 14 (section 601) to implement the program. Of particular importance to the subject of the recommendation is FGC section 3404(b), which authorizes the Commission to revoke the license for violations of any provision of the FGC, regulations adopted pursuant to the FGC, or for any violation of the terms of the license. Additionally, Title 14 section 601(e) authorizes the Department Director to suspend a license for any violation of the terms of the license. Every PLM license issued by the Department requires the licensee to ensure that all regulations and procedures are correctly followed and specifically provides that licensees are responsible for violations that take place on the property.

On July 25, 2018, I temporarily suspended the Jerusalem Creek Ranch PLM License because an individual subsequently identified by the PLM Licensee as the manager of the PLM property was cited for hunter trespass in connection with accessing the PLM property, and he was knowingly feeding big game and maintaining several active bait stations on the PLM property.

On September 9, 2017 the Department was notified of hunter trespass on a property adjacent to the Jerusalem Creek Ranch PLM.

- A Wildlife Officer responded and made contact with the reporting party (RP). The RP explained that a white Chevy pickup truck was parked inside his property. The RP further explained he looked inside the bed of the pickup truck and observed several bags of grain and Purina Antler Max which he photographed with his cell phone. According to the RP, a short time later an individual riding an ATV and carrying a hunting rifle returned to the truck, loaded the ATV onto the trailer behind the truck and left in the direction from which he had come.
- The Wildlife Officer then made contact with the individual in the white truck who stated he was working on the Jerusalem Creek Ranch at the request of the owner. There were no longer bags of bait in the bed of the truck. When asked why he had bait in the back of his truck earlier, the individual stated he was working on a project in Oregon but admitted there was no one in Oregon the officer could call to confirm the project and admitted to hiding the bait "in the pump house on the ranch."
- The individual was cited for hunter trespass (Section 2016, Fish and Game Code).
- On September 10, 2017 the Wildlife Officer returned to Jerusalem Creek Ranch to obtain additional information.
- This visit revealed six active bait sites within the PLM property. These bait sites included different combinations of salt blocks, feeders, cracked corn, grain, antler growth supplements and cameras.
- The first bait station the Wildlife Officer observed was located 50 feet from the road entering towards the only dwelling on the property which serves as the general headquarters of the PLM. This road is the only access point going in and out of the dwelling. The bait station faces the dwelling and has a motion sensor activating light.
- A large storage container with (25) 50 pound bags of Grainland Select Premium Feed Grains and (68) 50 pound bags of Purina Antler Max was found on the property.
- It should be noted that prior to 2016 this PLM was allowed a total of three mineral supplement stations that included selenium to improve wildlife health, and these stations were authorized and included in the PLM license language; however, most of the substances discovered at the Jerusalem Creek Ranch do not meet this definition and are considered bait.



Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission  
October 2, 2018  
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- At the conclusion of the investigation, the Department recommended prosecution of the individual for the additional violation of knowingly feeding big game mammals (Section 251.3, Title 14, CCR).
- The individual ultimately plead guilty to Penal Code section 602(m), entering and occupying real property or structures of any kind without the consent of the owner, the owner's agent, or the person in lawful possession, and was placed on DA probation.

The Jerusalem Creek Ranch PLM license clearly states (Item 3) the licensee must ensure compliance with all hunting regulations and procedures, and the PLM is responsible for violations that occur on the property. The presence of active bait stations on the property are a clear violation of hunting regulations and the PLM license. If you have any questions, please contact David Bess, Deputy Director of the Department's Law Enforcement Division at (916) 653-4094 or by email at [David.Bess@wildlife.ca.gov](mailto:David.Bess@wildlife.ca.gov).

cc: David Bess, Deputy Director  
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Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission  
October 2, 2018  
Page 4

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California Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
Director's Office  
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Sacramento, California 94244-2090  
(916) 653-4094  
<http://www.wildlife.ca.gov>

EDMUND G. BROWN, JR., Governor  
CHARLTON H. BONHAM, Director



July 25, 2018

Mr. Jon Warren

Anderson, CA 96007

Dear Mr. Warren:

SUBJECT: JERUSALEM CREEK RANCH PLM LICENSE TERMINATION

As you may be aware, the California Department of Fish and Wildlife (Department) issued a citation and investigated violations of the Fish and Game Code that occurred on and near the Jerusalem Creek Ranch Private Lands Management Area (PLM) on September 9 and 10, 2017. The Department was notified on September 9, 2017 of hunter trespass on a property adjacent to the Jerusalem Creek Ranch PLM. A Wildlife Officer responded where he found and made contact with an individual who was accessing Jerusalem Creek Ranch PLM through the neighbor's property and doing some work on Jerusalem Creek Ranch PLM. This individual was cited for hunter trespass (Section 2016, Fish and Game Code). In addition, wildlife bait was found in the back of the violator's truck. The Wildlife Officer returned to the area and inspected Jerusalem Creek Ranch PLM on September 10, 2017 for additional information. This visit revealed numerous active bait sites within the PLM property with salt blocks, feeders, cameras, grain, and antler growth supplements on the ground. A large storage container with 25 bags of Grainland Select Premium Feed Grains, and 68 bags of Purina Antler Max was also found on the property.

After the investigation, the Department recommended prosecution of the violator for the additional violation of knowingly feeding big game mammals (Section 251.3, Title 14, California Code of Regulations (CCR)). Your 2017 Private Lands Management License, item 3 under Licensee Responsibilities, provides that you must ensure compliance with all hunting regulations and procedures, and the PLM is responsible for violations that occur on the property. The presence of active bait stations on your property are clear violations of hunting regulations and your PLM License. CCR Title 14 section 601(e) authorizes the Director to temporarily suspend the license for any breach or violation of the terms of the license.

Pursuant to this authority, I am hereby temporarily suspending the Jerusalem Creek Ranch PLM License. Consistent with Title 14 section 601(e), the Department will notify the Fish and Game Commission (Commission) and ask the Commission to revoke the Jerusalem Creek Ranch PLM License. The Commission meeting date for this item has not yet been determined. Once the item is scheduled, you will receive

*Conserving California's Wildlife Since 1870*

Mr. Jon Warren  
July 25, 2018  
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notification by mail in advance of the meeting and may attend in person to contest our recommendation.

If you have any questions or need further information, please contact the Department's PLM Coordinator, Ms. Victoria Barr at (916) 445-4034.

Sincerely,



Charlton H. Bonham  
Director

cc: Department of Fish and Wildlife

Stafford Lehr, Deputy Director  
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cc's continued on Page 3

Mr. Jon Warren  
July 25, 2018  
Page 3

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Jennifer Carlson, Environmental Scientist  
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Patrick Sater, Environmental Scientist  
Northern Region  
[Patrick.Sater@wildlife.ca.gov](mailto:Patrick.Sater@wildlife.ca.gov)

**From:** Jon Warren  
**Sent:** Wednesday, August 15, 2018 2:25 PM  
**To:** Barr, Victoria@Wildlife <Victoria.Barr@wildlife.ca.gov>  
**Subject:** Re: Jerusalem Creek Ranch

Hi Victoria, I received the July 25 termination letter. Has a hearing date been set yet? It was my understanding Dale MacDougal replaced my role as PLM manager last year as well. Am I still the registered manager?

Jon Warren

**From:** "Barr, Victoria@Wildlife" <Victoria.Barr@wildlife.ca.gov>  
**Date:** Tuesday, January 31, 2017 at 11:15 AM  
**To:** Jon Warren < >  
**Subject:** RE: PLM 5 yr renewal

Hi Jon,

The 2017 license fees and the 5-year renewal application are on the right hand side of the PLM webpage at: <https://www.wildlife.ca.gov/Hunting/PLM>

Let me know if you have any other questions.

Victoria

**From:** Jon Warren  
**Sent:** Tuesday, January 31, 2017 8:20 AM  
**To:** Barr, Victoria@Wildlife  
**Subject:** PLM 5 yr renewal

Hi Victoria, I was unable to locate the renewal fee online. Can you assist me?

Jon

# ARREST/INVESTIGATION REPORT

**CONFIDENTIAL**

WPD 6a (10-98)

Page 1

DATE OF INCIDENT / OCCURANCE September 10, 2017		TIME (2400) 0800	CITY/COUNTY/JUDICIAL DISTRICT Shasta County Superior Court - 45670	
<input type="checkbox"/> Arrest Report <input checked="" type="checkbox"/> Formal Complaint		TYPE OF REPORT <input checked="" type="checkbox"/> Self Initiated <input type="checkbox"/> Complaint <input type="checkbox"/> Commercial Fishing <input type="checkbox"/> Recreational Fishing <input checked="" type="checkbox"/> Hunting <input type="checkbox"/> Trapping <input type="checkbox"/> Inland Pollution <input type="checkbox"/> Marine Pollution <input type="checkbox"/> Cal TIP <input type="checkbox"/> Litter		

## Suspect Information

Name Suspect #1 (First, Middle, Last) (S-1) James Dale MacDougall		Sex <input checked="" type="checkbox"/> M <input type="checkbox"/> F	Date of Birth (MM/DD/YY) [REDACTED]	Citation Number AD2029571
Mailing Address (Street, Apt., City, State, Zip Code) [REDACTED] Shasta Lake, Ca 96019				Home Phone [REDACTED]
Physical Address (Street, Apt., City, State, Zip Code) [REDACTED] Shasta Lake, Ca 96019				Business Phone [REDACTED]
Identification:		Suspect Description:		
Type: CDL # [REDACTED]	Hair:	Eyes:	Height:	Weight:
Number: [REDACTED]	Ethnicity:		Other:	
Vehicle Type <input checked="" type="checkbox"/> Auto <input type="checkbox"/> Vessel <input type="checkbox"/> Other	Description (Year, Make, Model, Color)			License Plate Number /VIN [REDACTED]

## Offenses and Charges

COUNT 1	CCR T14 251.3 – Knowingly feeding big game mammals.
COUNT 2	
COUNT 3	
COUNT 4	
COUNT 5	

## Evidence Seized

Evidence Description (Amount, Type, Serial Number, Etc.)	<input checked="" type="checkbox"/> Held <input type="checkbox"/> Returned <input type="checkbox"/> Destroyed <input type="checkbox"/> Other	Photographed?
		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

## Case Synopsis

Please see narrative on page 2.

Preparer's Name and Badge Number Cody Gamble #612	Date September 10, 2017	Reviewer's Name Lt. Richard Wharton #513	Date September 21, 2017
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**NARRATIVE/SUPPLEMENTAL**

WPD 6a (10-98)

Region # 2

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DATE OF INCIDENT / OCCURANCE September 10, 2017		TIME (2400) 0800	CITY/COUNTY/JUDICIAL DISTRICT Shasta County Superior Court - 45670	
X* APPLICABLE <input checked="" type="checkbox"/> Narrative <input type="checkbox"/> Arrest Report <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Formal Complaint		TYPE OF REPORT ("X" APPLICABLE) <input type="checkbox"/> Commercial Fishing <input checked="" type="checkbox"/> Hunting <input type="checkbox"/> Inland Pollution <input type="checkbox"/> Incident Report <input type="checkbox"/> Recreational Fishing <input type="checkbox"/> Trapping <input type="checkbox"/> Marine Pollution <input type="checkbox"/> Litter		
Location/Subject/Incident Name Jerusalem Ranch Platina Rd / James Dale MacDougall			Arresting/Case Officer Cody Gamble #612	Citation Number AD2029571

On September 09, 2017, I received a call from the Fish and Wildlife Dispatch of a possible hunting violation near the town of Ono, in Shasta County. I was informed the landowner of the Bullan Ranch, located off Platina Road, had contacted dispatch due to the fact someone was trespassing on his property. The owner said when he arrived at his ranch; he observed a white Chevy truck (96050B2) parked inside of his property. The truck had a trailer attached behind it. The truck had several California Deer Association stickers on it. A records check on the vehicle showed it was registered to the California Deer Association, out of Sacramento. The owner had explained he was going to lock the vehicle inside of the property and wait for me to arrive. The owner also informed dispatch he had observed several bags of deer bait inside the bed of the vehicle. At approximately 1945 hours, I arrived at the Bullan Ranch.

Upon arrival, I observed two subjects, later identified as the landowners, standing between Platina Road and the locked gate. Inside the locked gate was a white Chevy pickup. I asked the owners to explain to me what had happened. Mr. Charlie Bullan said he and his brother Joe Bullan had come out to their property to dove hunt that evening. Mr. C. Bullan said when they arrived at the property to hunt, they had observed the white Chevy truck parked inside their property. Mr. C. Bullan said no one had permission to be on their property. I asked Mr. C. Bullan if there were any easements through his property. Mr. C. Bullan said there were two other properties that had an easement but none had permission to park on his property. Mr. C. Bullan said they had looked in the bed of the truck and had observed several bags of grain and Purina Antler Max. It should be noted, these items are commonly used to illegally bait deer in California. Mr. C. Bullan said he also observed a box that contained numerous trail cameras in the bed of the truck. Mr. J. Bullan took several photos of the items in the truck bed. Mr. J Bullan then showed me several photos of 50lb bags of grain and Purina Antler Max in the bed of Mr. Macdougall's truck. (2) Of the bags were Grainland Select Premium Feed Grains, and the other (2) were Purina Antler Max. Mr. C. Bullan said they then called the Fish and Wildlife Dispatch to report the illegal trespass. Mr. C. Bullan said approximately an hour after they called the Fish and Wildlife Dispatch, the subject, later identified as **James MacDougall (CDL# [REDACTED])**, returned to his vehicle driving a side-by-side ATV. Mr. Macdougall then loaded the side by side onto the trailer behind his vehicle. Both Mr. J. Bullan and Mr. C. Bullan said Mr. Macdougall was carrying a hunting rifle. Mr. C. Bullan then said Mr. Macdougall approached them and asked what was going on. Mr. C. Bullan said he told Mr. Macdougall he had locked him in the property because he was trespassing and was waiting for the game warden to arrive. Mr. C. Bullan said Mr. Macdougall returned to his vehicle and then drove at a high rate of speed back to the location he had come from. Mr. C. Bullan said approximately 25 minutes later, Mr. Macdougall had returned to the gate in his truck, without his trailer or side by side. Mr. C. Bullan said I had arrived a short time later. It should be noted, the entire property is fenced and gated, and has numerous "No Trespassing" signs along Platina Road and at all entrances in accordance with Fish and Game Code 2016. I then went to talk with Mr. MacDougall.

Preparer's Name and Badge Number Cody Gamble #612	Date September 10, 2017	Reviewer's Name Lt. Richard Wharton #513	Date September 21, 2017
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**NARRATIVE/SUPPLEMENTAL**

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**CONFIDENTIAL**

WPD 6a (10-98)		DATE OF INCIDENT / OCCURANCE September 10, 2017	TIME (2400) 0800	CITY/COUNTY/JUDICIAL DISTRICT Shasta County Superior Court - 45670	
X" APPLICABLE <input checked="" type="checkbox"/> Narrative <input type="checkbox"/> Arrest Report <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Formal Complaint		TYPE OF REPORT ("X" APPLICABLE) <input type="checkbox"/> Commercial Fishing <input checked="" type="checkbox"/> Hunting <input type="checkbox"/> Inland Pollution <input type="checkbox"/> Incident Report <input type="checkbox"/> Recreational Fishing <input type="checkbox"/> Trapping <input type="checkbox"/> Marine Pollution <input type="checkbox"/> Litter			
Location/Subject/Incident Name Jerusalem Ranch Platina Rd / James Dale MacDougall			Arresting/Case Officer Cody Gamble #612		Citation Number AD2029571

Upon introducing myself to Mr. MacDougall, I asked him to tell me what had happened that evening. Mr. Macdougall said he came out to the property earlier in the evening to access the private property he was associated with. I asked Mr. MacDougall the name of the Ranch and who owned it. Mr. MacDougall said the property was called the Jerusalem Ranch and Court King was the owner. Mr. Macdougall then said he did not want to drive his truck and trailer, with the side by side, all the way up to the ranch. He instead decided to offload the side by side and drive it up the road to the property. I asked Mr. MacDougall if he had ever gained permission to trespass onto the property. Mr. MacDougall said "No". Mr. MacDougall said he knew he should not have parked on the property without permission. I asked Mr. MacDougall if he was aware of the property boundaries. He said yes. I asked Mr. MacDougall if he had a gun when he left on the side by side. Mr. MacDougall said he had brought his 204-caliber rifle with him in case he saw a coyote. I asked Mr. MacDougall what he had been doing on his property that evening. Mr. MacDougall said he worked for the California Deer Association, and had been helping the new owner of the property. I asked him what he had been helping the owner with on the property. Mr. MacDougall said he had been up irrigating the ranch. I then asked Mr. MacDougall if he had any deer bait in the back of his pickup. Mr. MacDougall said, "No, I know it's illegal to bait deer in California". I then looked in the back of Mr. MacDougall's truck bed. I found there were no longer any bags of grain or Purina Antler King in his truck bed, as I had previously observed in Mr. J. Bullan's pictures. I asked Mr. MacDougall, why he had bags of deer bait in the bed of his vehicle earlier that evening. Mr. MacDougall said that he had bought the bags around 5 days before on the coast. I again asked Mr. MacDougall why he had deer bait in the bed of his vehicle. Mr. MacDougall said, "Well you know I work for the Deer Association and do all kinds of projects". I asked Mr. MacDougall what kind of projects let him illegally bait deer in California. Mr. MacDougall again stated, "I know it's illegal to bait deer in California, I'm doing projects in Oregon". I asked Mr. MacDougall what projects he was doing in Oregon. Mr. MacDougall said he was doing a tristate deer herd project with Oregon, California and Nevada for the Deer Association. I asked Mr. MacDougall if he could give me the name of a single person in Oregon, who knew he was coming up to bait deer for a tri state project. Mr. MacDougall said "No". I explained to Mr. MacDougall how bad it looked when he had bags of deer bait in the back of his California Deer Association truck. Mr. MacDougall said he understood how that might look bad to the general public. I asked Mr. MacDougall if he had been baiting deer on the property he had just come from. Mr. MacDougall said, "No". I explained to Mr. MacDougall this was not my first day on the job and we both knew there was deer bait on his ranch. Mr. MacDougall again said there was no bait on the ranch. At that time, he did say the previous owners had been baiting but he and the new owner had not been baiting deer. I asked Mr. MacDougall how long ago had the new owner taken over the ranch. He said several months before. I explained to Mr. MacDougall, that I wanted to know where he had placed the bait that was in the back of his vehicle from earlier that evening. Mr. MacDougall said, "I hid it in the pump house on the ranch". I asked Mr. MacDougall why he had hidden the bait if he was going to legally use it in Oregon for a project. Mr. MacDougall said I do not know. I told Mr. MacDougall the reason you drove the trailer back to the ranch and hid the bait, was due to the fact you were told the game warden was on his way out to the property. Mr. MacDougall said "Yeah". I explained to Mr. MacDougall, I would be returning to the property the next

Preparer's Name and Badge Number Cody Gamble #612	Date September 10, 2017	Reviewer's Name Lt. Richard Wharton #513	Date September 21, 2017
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**NARRATIVE/SUPPLEMENTAL**

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Region # 2

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DATE OF INCIDENT / OCCURANCE September 10, 2017	TIME (2400) 0800	CITY/COUNTY/JUDICIAL DISTRICT Shasta County Superior Court - 45670
X* APPLICABLE <input checked="" type="checkbox"/> Narrative <input type="checkbox"/> Arrest Report <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Formal Complaint		
TYPE OF REPORT ("X" APPLICABLE) <input type="checkbox"/> Commercial Fishing <input checked="" type="checkbox"/> Hunting <input type="checkbox"/> Inland Pollution <input type="checkbox"/> Incident Report <input type="checkbox"/> Recreational Fishing <input type="checkbox"/> Trapping <input type="checkbox"/> Marine Pollution <input type="checkbox"/> Litter		
Location/Subject/Incident Name Jerusalem Ranch Platina Rd / James Dale MacDougall		Citation Number AD2029571

morning, to look for illegal baiting activity. I told him now was the time to come clean with me on what I was going to find on the property. Mr. Macdougall said he had not been baiting deer on the property. I explained to Mr. MacDougall that I wanted to see the bait he had hidden in the pump house. Mr. MacDougall said, "You can look in the pump house". I explained to Mr. MacDougall that he had illegally trespassed onto two private properties with his rifle, without written permission. Mr. MacDougall then asked if he would be receiving two citations. I explained to Mr. Macdougall, he would be receiving only one citation for violation of section 2016 of the Fish and Game Code for trespassing onto private property. I seized Mr. MacDougall's Remington 700 .204 - Caliber Rifle (G6580863) as evidence.

As I left Mr. MacDougall for the evening, I explained, I would be returning to his ranch the next morning to look for the bait he had hidden in the pump house.

On September 10, 2017, I returned to the location I had been the previous evening. After arriving at the Bullan Ranch, I drove north through the second property onto the Jerusalem Ranch. As I entered the property, I observed two posted signs that read, "You Are Entering JERUSALEM CREEK RANCH PRIVATE LANDS WILDLIFE MANAGEMENT AREA". Up until that point, I was unaware that the property was in the Department of Fish and Wildlife's Private Lands Management Program. The Departments "PLM" program is listed under the California Code of Regulations Title 14, Section 601:

**Enhancement and Management of Fish and Wildlife and their Habitat on Private Lands.**

**(a) Definition and Scope: A Private Lands Wildlife Habitat Enhancement and Management Area, (Herein after referred to as a Private Wildlife Management Area) is an area of private lands for which the landowner or their designee has completed and implemented a wildlife habitat enhancement and management plan that actively encourages the propagation, conservation and wise use of the fish and wildlife populations on their land. Such areas shall be licensed annually by the department.**

All PLM agreements state: Department Wildlife Officers will be provided access in order to ensure compliance with hunting laws and regulations. I then entered the property. Once on the property, I observed a flat open area that contained the main dwelling, BBQ area, and what appeared to be the detached pump house. Near the pump house was the trailer and side by side, I had observed, through photos, from the night before. I then inspected what appeared to be the pump house. Mr. MacDougall had given me permission to enter to look for the bait he had hidden from the previous evening. On the outside of the structure, I observed several game feeders lying on the ground. On the inside of the building, I found a game feeder with a sack of corn inside. There were also several new in the box, feeder kit assemblies. These assemblies are attached to the bottom of the feeders, and

Preparer's Name and Badge Number Cody Gamble #612	Date September 10, 2017	Reviewer's Name Lt. Richard Wharton #513	Date September 21, 2017
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## NARRATIVE/SUPPLEMENTAL

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DATE OF INCIDENT / OCCURANCE September 10, 2017		TIME (2400) 0800	CITY/COUNTY/JUDICIAL DISTRICT Shasta County Superior Court - 45670		
X" APPLICABLE <input checked="" type="checkbox"/> Narrative <input type="checkbox"/> Arrest Report <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Formal Complaint		TYPE OF REPORT ("X" APPLICABLE) <input type="checkbox"/> Commercial Fishing <input checked="" type="checkbox"/> Hunting <input type="checkbox"/> Inland Pollution <input type="checkbox"/> Incident Report <input type="checkbox"/> Recreational Fishing <input type="checkbox"/> Trapping <input type="checkbox"/> Marine Pollution <input type="checkbox"/> Litter			
Location/Subject/Incident Name Jerusalem Ranch Platina Rd / James Dale MacDougall			Arresting/Case Officer Cody Gamble #612		Citation Number AD2029571

they regulate the time of day the feeders come on and spread bait onto the ground. I also found a white plastic bag from Sportsman's Warehouse. Inside was a 6lb bag of Big & J long-range deer bait. There were also several bottles of Blacktail deer DOE IN HEAT estrus urine. I was unable to find the bait that was in the back of Mr. MacDougall's vehicle from the previous evening. I then drove from the main house and began driving the interior roads on the ranch.

On a road, located North West of the main house (Location #1), I observed an area where the grass had been trampled down from animal activity. At this location, I found two large piles of bait on the ground. One pile was consistent with grain. The other pile was in a pellet form (consistent with Purina Antler Max bait). Both of these piles were consistent with the bait I had observed, through photos, in the back of Mr. MacDougall's truck the night before. In the tree near the bait, I observed an attached Covert trail camera (serial #1608071852708). The camera was aimed at the bait pile. This is a common practice in baiting cases to view pictures / videos of wildlife coming into the bait. I seized random bait samples from each pile. I also seized the trail camera (with an 8GB SanDisk Ultra memory card). The three items seized were labeled Location #1, items 1-3. From Location #1, I observed a game feeder hanging from a tree, approximately 70 yards to the North. I walked to this location.

After arriving at this location (Location #2), I observed a camouflage game feeder hanging from the tree. After inspecting the feeder, I found it contained approximately 25 lbs. of cracked corn. Next to the feeder, on the ground, I found a salt block. Within approximately 15 feet of the salt block, I observed two large piles of bait. Again, one pile was consistent with grain, the other was in pellet form. Both piles appeared to be the same type as location #1. Approximately 20 yards from the baited area, I observed a tree stand. These stands are commonly used to aid in the taking of big game animals. I seized the (1) feeder, (1) salt block, and took a random bait sample from each pile on the ground as well as a random sample of cracked corn from inside the feeder. The five items seized were labeled Location #2, items 1-5. I then left Location #2.

A short time later, I arrived on the Western side of the Ranch (Location #3). Along the side of the road, I observed two large piles of bait on the ground. Again, one pile was consistent with grain, the other pile was in pellet form. Both piles appeared to be the same I had found at Location #1 and #2. I took a random bait sample from each pile on the ground. The two samples seized were labeled Location #3, items 1-2. I then left Location #3, and left the ranch.

At approximately 1310 hours, I returned to the Jerusalem Ranch main house area. At this time, I seized the bag of corn from inside what appeared to be the pump house (Location #4). I also seized the 6lb bag of Big & J long-range deer bait. The two items seized, were labeled Location #4, items 1-2.

Preparer's Name and Badge Number Cody Gamble #612	Date September 10, 2017	Reviewer's Name Lt. Richard Wharton #513	Date September 21, 2017
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**NARRATIVE/SUPPLEMENTAL**

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Region #12 Page 6

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DATE OF INCIDENT / OCCURANCE September 10, 2017		TIME (2400) 0800	CITY/COUNTY/JUDICIAL DISTRICT Shasta County Superior Court - 45670		
X* APPLICABLE <input checked="" type="checkbox"/> Narrative <input type="checkbox"/> Arrest Report <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Formal Complaint		TYPE OF REPORT ("X" APPLICABLE) <input type="checkbox"/> Commercial Fishing <input checked="" type="checkbox"/> Hunting <input type="checkbox"/> Inland Pollution <input type="checkbox"/> Incident Report <input type="checkbox"/> Recreational Fishing <input type="checkbox"/> Trapping <input type="checkbox"/> Marine Pollution <input type="checkbox"/> Litter			
Location/Subject/Incident Name Jerusalem Ranch Platina Rd / James Dale MacDougall			Arresting/Case Officer Cody Gamble #612		Citation Number AD2029571

At approximately 1322 hours, I contacted Mr. MacDougall via the telephone. After Mr. MacDougall answered the phone, I explained to him I had returned to the ranch earlier that morning, as per our conversation the night before. I explained to Mr. MacDougall that I had found numerous bait piles on the property. Mr. MacDougall said that it was not really bait and that a lot of it was old. I explained that the salt blocks appeared to have been out for a while, but all of the other bait I had found, was very recently placed out, due to the amounts that were still on the ground and condition of the bait. Mr. MacDougall became very quiet at this time. I told Mr. MacDougall he should really start being honest with me about the bait. I asked Mr. MacDougall if he had placed the bait on the property. Mr. MacDougall said, "I am the one who put it on the property". Mr. MacDougall again stated, he really was not trying to bait the deer in for hunting purposes. I asked him what he was trying to do then. Mr. MacDougall said he had placed the bait out to try to see what kind of deer were on the property and to see what their habits were. I explained to Mr. MacDougall that when you place bait out, it drastically changes deer movements and behaviors. That is one of the main reasons baiting is illegal in California, and due to his current job working for the California Deer Association, he should be well aware of that. Mr. MacDougall said, "Yeah I know". I asked Mr. MacDougall if anyone else had placed bait out on the property. Mr. MacDougall said no and that he was the only one doing it. I explained to Mr. MacDougall, I had searched the pump house, near the main house, for the bait he had hidden the previous evening but was unable to locate it. Mr. MacDougall said that building was not the pump house, it was actually the generator shed. I asked Mr. MacDougall where the pump house was located. Mr. MacDougall said it was in the sheds buried in the hillside, just north of the main house. I had observed two storage containers buried in the hillside, while travelling to Location #1. I explained the area and sheds to Mr. MacDougall. He said that is where he had hidden the bait he had in his truck. I explained to Mr. MacDougall, that I needed to see the bait he had hidden from the previous evening. Mr. MacDougall then gave me permission to retrieve the bait from the sheds. I then ended the phone conversation with Mr. MacDougall.

As I began to leave the main housing area, I observed a covered wooden structure in the front yard. I walked over to the structure (Location#5), and found that it was a deer feeding station. The wooden box, on the bottom, was filled with a large pile of grain and pellets. Both substances were consistent with what I had found at Locations #1, #2 and #3. I took a random sample of each type of bait. Mounted to the top of the feeder was a motion activated light. This light would activate if anything came near the feeder during nighttime hours. The feeder is clearly visible from inside the house. Therefore, if a deer or any other animal, walked up to the feeder and activated the light, whoever was inside the house could easily see what was at the bait station. In front of the feeder, lying on the ground was a salt block. There were old camera stations set up at this location but did not currently have cameras in them. I seized the (1) salt block, and two random samples of bait from the feeder. The three seized samples were labeled Location #5, items 1-3. I then left Location #5.

I then arrived at the buried storage containers (Location #6), where Mr. MacDougall had told me he had hidden the bait from the previous evening. I first opened the doors on the right storage container. There I found

Preparer's Name and Badge Number Cody Gamble #612	Date September 10, 2017	Reviewer's Name Lt. Richard Wharton #513	Date September 21, 2017
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**NARRATIVE/SUPPLEMENTAL**

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WPD 6a (10-98)		Region #2		Page 7	
DATE OF INCIDENT / OCCURANCE September 10, 2017		TIME (2400) 0800	CITY/COUNTY/JUDICIAL DISTRICT Shasta County Superior Court - 45670		
X* APPLICABLE <input checked="" type="checkbox"/> Narrative <input type="checkbox"/> Arrest Report <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Formal Complaint		TYPE OF REPORT ("X" APPLICABLE) <input type="checkbox"/> Commercial Fishing <input checked="" type="checkbox"/> Hunting <input type="checkbox"/> Inland Pollution <input type="checkbox"/> Incident Report <input type="checkbox"/> Recreational Fishing <input type="checkbox"/> Trapping <input type="checkbox"/> Marine Pollution <input type="checkbox"/> Litter			
Location/Subject/Incident Name Jerusalem Ranch Platina Rd / James Dale MacDougall			Arresting/Case Officer Cody Gamble #612		Citation Number AD2029571

parts to bait stations as well as numerous bags of old bait. I also found discarded bags of cracked corn. These bags appeared to match the cracked corn I had found in the hanging game feeder at Location #2. I seized (2) of the empty bags of cracked corn. In the container on the right, I was unable to find the bags of bait Mr. MacDougall had hidden from the previous evening. I then opened the left storage container. Inside I found several pallets of bait. On the right side of the container, there was one pallet that contained (25) 50lb bags of Grainland Select Premium Feed Grains. These were the exact same brand of grain sacks observed in the bed of Mr. MacDougall's truck. On the left side of the storage container were several more pallets. On those pallets, I found (68) 50lb bags of Purina Antler Max deer bait. These were also the exact same brand observed in the bed of Mr. MacDougall's truck. I seized (1) 50lb bag of Grainland Select Premium Feed Grains, and (1) 50lb bag of the Purina Antler Max deer bait. I seized in place, the remaining (91) bags ((24) bags of Grainland Select Premium Feed Grains, and (67) bags of Purina Antler Max). I labelled the left storage container as official evidence, and placed two evidence seals on the door. One label read, "Seized in place do not remove from location". From this location, I ultimately seized (2) discarded cracked corn bags, (25) 50lb bags of Grainland Select Premium Feed Grains ((1) seized as evidence, (24) seized in place), and (68) 50lb bags of Purina Antler Max deer bait ((1) seized as evidence, (67) seized in place). The three pieces of evidence I seized and took with me, were labeled Location #6, items 1-3. I then left Location #6.

I then returned to the West side of the property. There on a road, I found a large metal game feeder (Location #7). The feeder was very large in size and had (4) gravity fed feeding tubes. In order to fill the feeder, you would have to drive a vehicle next to it and stand in the bed of the vehicle to reach the cover on the top. I would estimate the feeder could hold approximately 500 lbs. of bait. Inspection of the feeder found it had pellets inside of it. These pellets appeared to be the same that I had observed at Locations #1, #2, #3, and #5. I took a random sample of the bait as evidence. Mounted on a tree near the feeder, I observed a Browning Strike Force HD Pro Model BTC-5HDP trail camera (serial #0210036703175HDP). The camera was placed so it would take photos / videos of animals at the bait station. I seized the camera (with memory card) as evidence. Approximately 20 yards away from the bait station, I observed some older bait on the ground. Mounted on a tree near this location, I found a Covert trail camera (serial ##1604071901334). This camera was also placed to take photos / videos of animals at the bait station. I also seized this camera (with memory card) as evidence. Approximately 25 yards from the feeder, I found a tree stand. These stands are commonly used to aid in the taking of big game animals. At this location, I seized (1) random bait sample from the feeder, (1) Browning trail camera (with a 4GB DELKIN DEVICES memory card), and (1) Covert trail camera (16GB PNY Performance memory card). The three pieces of evidence were labeled Location #7, items 1-3. I then left Location #7.

I continued driving on the West side of the property. On a spur road, I observed a game feeder hanging from a tree (Location #8). I walked into the area and observed a salt block on the ground. After lowering the feeder from the tree, I observed it had approximately 20 lbs. of cracked corn inside. I found a mounted Covert trail camera on the tree that the feeder was attached to. The camera was placed to take photos / videos of animals

Preparer's Name and Badge Number Cody Gamble #612	Date September 10, 2017	Reviewer's Name Lt. Richard Wharton #513	Date September 21, 2017
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**NARRATIVE/SUPPLEMENTAL**

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WPD 6a (10-98)		Region #2		Page 8	
DATE OF INCIDENT / OCCURANCE September 10, 2017		TIME (2400) 0800	CITY/COUNTY/JUDICIAL DISTRICT Shasta County Superior Court - 45670		
X* APPLICABLE <input checked="" type="checkbox"/> Narrative <input type="checkbox"/> Arrest Report <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Formal Complaint		TYPE OF REPORT ("X" APPLICABLE) <input type="checkbox"/> Commercial Fishing <input checked="" type="checkbox"/> Hunting <input type="checkbox"/> Inland Pollution <input type="checkbox"/> Incident Report <input type="checkbox"/> Recreational Fishing <input type="checkbox"/> Trapping <input type="checkbox"/> Marine Pollution <input type="checkbox"/> Litter			
Location/Subject/Incident Name Jerusalem Ranch Platina Rd / James Dale MacDougall			Arresting/Case Officer Cody Gamble #612		Citation Number AD2029571

at the bait site. Approximately 10 yards from the feeder, I found two large piles of bait on the ground. Again, one pile was consistent with grain; the other pile was in pellet form. Both piles appeared to be similar to the ones I had found at Locations #1, #2, #3, #5, and #7. I took a random bait sample from each pile on the ground. Approximately, 10 yards from the feeder, I observed a tree stand. These stands are commonly used to aid in the taking of big game animals. At this location, I seized (1) feeder, (1) random sample of the cracked corn inside the feeder, (1) salt block, (1) Covert trail camera (without a memory card), and the (2) random samples of bait from the ground. The six samples seized, were labeled Location #8, items 1-6. I then left the property.

In October 2017, I wrote search warrant (2017-279). The Warrant was to view all data contained in (1) 4GB DELKIN DEVICES memory card found in Browning Strike Force HD Pro Model BTC-5HDP trail camera (serial #0210036703175HDP), (1) 16GB PNY Performance memory card found in Covert trail camera (serial #1604071901334) and (1) 8GB ScanDisk Ultra memory card found in a Covert trail camera (serial #1608071852708). The Honorable Judge Stephen H. Baker signed the warrant on October 18, 2017.

On October 20, 2018, I served the search warrant on all (3) memory cards. Fish and Wildlife Department Employee Louis LeFrak aided me in serving the warrant. Mr. LeFrak is a Staff Information Systems Technician for the Department. During the search of 4GB DELKIN DEVICES memory card, found in Browning Strike Force HD Pro Model BTC-5HDP trail camera (serial #0210036703175HDP), I found (158) JPEG Images. During the search of (1) 16GB PNY Performance memory card, found in Covert trail camera (serial #1604071901334), I found (2207) JPEG Images, (177) Video Clips and (6) TIFF Images. During the search of (1) 8GB ScanDisk Ultra memory card, found in Covert trail camera (serial #1608071852708), I found (1377) JPEG Images, and (1) Video clip. All data retrieved, was saved on an external thumb drive. While reviewing the video clips and photos, I was able to identify Mr. MacDougall in several images. Hundreds of the retrieved photos contained images of wildlife feeding in the illegally baited areas.

A copy of the signed Search Warrant, and a Notice of Service were mailed to the Post Office Box provided by Mr. MacDougall.

I respectfully ask the court, that citation AD2029570, issued to Mr. MacDougall on September 09, 2017, for violation of section 2016 of the Fish and Game Code for hunter trespass onto fenced/posted private property, be combined with citation AD2029571, issued as a formal complaint to Mr. MacDougall for violation of section 251.3 of the California Code of Regulations Title 14 for knowingly feeding big game animals. I would ask the

Preparer's Name and Badge Number Cody Gamble #612	Date September 10, 2017	Reviewer's Name Lt. Richard Wharton #513	Date September 21, 2017
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**NARRATIVE/SUPPLEMENTAL**

WPD 6a (10-98)

Region 2

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DATE OF INCIDENT / OCCURANCE September 10, 2017	TIME (2400) 0800	CITY/COUNTY/JUDICIAL DISTRICT Shasta County Superior Court - 45670
X" APPLICABLE <input checked="" type="checkbox"/> Narrative <input type="checkbox"/> Arrest Report <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Formal Complaint		
TYPE OF REPORT ("X" APPLICABLE) <input type="checkbox"/> Commercial Fishing <input checked="" type="checkbox"/> Hunting <input type="checkbox"/> Inland Pollution <input type="checkbox"/> Incident Report <input type="checkbox"/> Recreational Fishing <input type="checkbox"/> Trapping <input type="checkbox"/> Marine Pollution <input type="checkbox"/> Litter		
Location/Subject/Incident Name Jerusalem Ranch Platina Rd / James Dale MacDougall	Arresting/Case Officer Cody Gamble #612	Citation Number AD2029571

court to file on both charges. I would also respectfully request all items seized in this case be forfeited pursuant to Fish & Game Code section 12157.

Preparer's Name and Badge Number Cody Gamble #612	Date September 10, 2017	Reviewer's Name Lt. Richard Wharton #513	Date September 21, 2017
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DSINQCV

SHASTA COUNTY COURTS

9/17/18 DAA23084B

DOCKET SUMMARY DISPLAY

15:20:05 SAGDA

COURT MC BRANCH RD CASE TYPE CR SUB-TYPE M CRIMINAL MISDEMEANOR  
Case # 17-0006784-002 Status RC Judge FLYNN DANIEL  
Party Name MACDOUGALL, JAMES DALE Prty Status AC Type DF

MSDINF:Other Non-traffic Misd/Ordinance

DISPO DATE.: 12/18/17

DISPOSITION: PROCEEDINGS HELD

CITE

DEF PRES W/ATTY COX-977, DA D VU PRES BEF JDG

RUGGIERO. DEF ARR. ATTY GIVEN COPY OF COMPLAINT. ARR

& ADV OF RIGHTS WAIVED. NOT GUILTY ENTERED AS TO

ALL. CONT W/GTW FOR CSC. DEF ORD PRES.

12/26/17 SETTLEMENT CONF

2/05/18 8:30 GMWCC\*

DISPO DATE.: 02/05/18

DISPOSITION: PROCEEDINGS HELD

SETTLEMENT CONFERENCE

DEF PRES W/ATTY COX, DDA EBERSOLE BEF JDG RYAN. ON

MOT OF DA COMPL AMENDED TO ADD CT 3 PC602(M). NCP CT

3, ON MOT OF DA BAL DISM. JUDGMENT DEFERRED FOR 12

MOS, OBEY ALL LAWS, DA PROB, PROPERLY OBEY EASEMENT

ROLL UP/ROLL DOWN

More...

F13=Parties F14=Charges F16=Others F17=Dockets F18=Ticklers

F3=Exit

F7=Print Docket

F12=Previous

DSINQCV

SHASTA COUNTY COURTS  
DOCKET SUMMARY DISPLAY

9/17/18 DAA23084B  
15:20:23 SAGDA

COURT MC BRANCH RD CASE TYPE CR SUB-TYPE M CRIMINAL MISDEMEANOR  
Case # 17-0006784-002 Status RC Judge FLYNN DANIEL  
Party Name MACDOUGALL, JAMES DALE Prty Status AC Type DF

MSDINF:Other Non-traffic Misd/Ordinance  
AT BULLEN RANCH, RESTITUTION RESERVED FOR CHARLEY &  
JOE BULLEN. CONT'D W/GTW FOR DEJ/DA PROB. DEF ORD  
PRES.

2/05/18 DEJ OTHER GMWCC

DEFERRED JUDGMENT/DA'S PROBATION

2/08/18 DA'S PROB CONTROL DT 2/04/19 8:30 GMWCC\*

DA'S PROBATION CONTROL DATE

ROLL UP/ROLL DOWN

Bottom

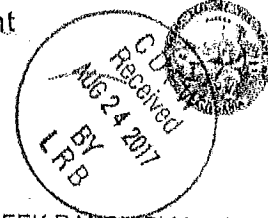
F13=Parties F14=Charges F16=Others F17=Dockets F18=Ticklers  
F3=Exit F7=Print Docket

F12=Previous



## 2017 Private Lands Management License Agreement

PLM: JERUSALEM CREEK RANCH PLM



### PRIVATE LANDS MANAGEMENT (PLM)

Enclosed are the tags and/or seals that have been approved and issued for JERUSALEM CREEK RANCH PLM. Also, enclosed are your PLM License Agreement, log sheets, and other pertinent information you will need to administer your program. Please review your order to ensure you received the correct amount of tags and/or seals.

### LICENSEE RESPONSIBILITIES

1. The PLM is responsible for maintaining an accurate accounting of all tags and/or seals issued under the PLM Program.
2. **Prior to January 4, 2018 return all completed Harvest Report, report card portions of tags, all unissued PLM tags, completed log sheets, exchanged deer tags, and PLM voucher tags to:** Department of Fish and Wildlife, Wildlife Branch, 1812 Ninth Street, Sacramento, California 95814.
3. **The PLM must ensure that all hunting regulations and procedures are correctly followed and enforced. The PLM will be held responsible for any infraction that may take place.**
4. By February 1, 2018 complete and submit an Annual Report to the regional PLM Coordinator.

ATTENTION: Due to the mandatory harvest reporting regulation in Section 708.5(b), Title 14 of the CCR, hunters are required to report their deer tags regardless of success, however, since hunters have exchanged their unused deer tag for your PLM deer tag, please inform them to not submit a harvest report on the deer tag they exchanged. The Department will complete the harvest reporting for the unused deer tag once the Department receives your log sheets and tags at the end of the hunt season.

### TAGS AND SEALS

The licenses and tags are printed on generic waterproof, tear resistant paper. If licenses and tags are exposed to extreme heat, they will darken and become discolored. However, a discolored license or tag is still valid as long as the text and signature are still readable.

Upon receipt of tags and/or seals the PLM must verify the contents to ensure accuracy by completing the following steps:

1. Verify that the tags and/or seals received are the approved tags authorized by the Fish and Game Commission.
2. Write any discrepancies (i.e., missing tag items, seals or any wrong items received) and mail, email or fax a copy, within five (5) business days of receipt, to Mrs. Kelli Hutnick at the Department's LRB at 1740 N. Market Blvd., Sacramento, CA 95834. You may also contact Mrs. Hutnick by telephone (916) 928-8323, email [Kelli.Hutnick@wildlife.ca.gov](mailto:Kelli.Hutnick@wildlife.ca.gov) or by Fax at (916) 419-7587.
3. Retain the Purchase Receipt for your records.

**\*\*IMPORTANT:** Claims of missing items will only be considered if they are reported in writing to the LRB within five (5) business days of receipt.

Please sign and return a copy of this license agreement to the LRB at the above address and retain one copy for your records.

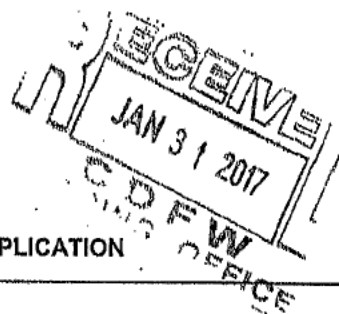
I hereby certify that I have read the terms and conditions of my PLM License Agreement and that I understand and agree to be bound by the terms of said license and the requirements for issuing and reporting all PLM tags and seals.

Name: Tom Warner Title: member

Signed: [Signature] Date: 8-21-17



State of California -- Department of Fish and Wildlife  
**PRIVATE LANDS WILDLIFE HABITAT ENHANCEMENT  
AND MANAGEMENT AREA LICENSE APPLICATION**  
DFW 537 (Rev. 12/12)



☐ INITIAL APPLICATION

☒ RENEWAL APPLICATION

Property Name Jerusalem Creek ranch PLM		
Applicant Name JoN warren	Telephone [REDACTED]	Ext. [REDACTED]
Email (Optional)		
Mailing Address [REDACTED]		Street Address (if different)
City Anderson	State CA	Zip 96007
City	State	Zip
County/Counties of Management Area Shasta		Area Size (Acreage) 720

**Requirements for an Initial or a Renewal Application:**

**Three (3) copies of a management plan which must contain, but is not limited to:**

- A legal description and four (4) original USGS quadrangle maps (or equivalent maps) showing the area's boundaries, access roads, and any public lands within and/or adjacent to the Private Wildlife Management Area (For a Renewal Application: submit these maps only if the legal description is different from the Initial plan);
- An estimate of the wildlife and habitats present within the Private Wildlife Management Area, including an indication of animal distribution and habitat condition based on the California Wildlife Habitat Relationships Database System;
- A statement of management objectives;
- A detailed description of proposed management actions that are intended to achieve the management objectives;
- The county General Plan land use designation for the Private Wildlife Management Area;
- A check in the appropriate amount (see PLM fee list at <http://www.dfg.ca.gov/wildlife/hunting/plm.html>).

**Additional requirements for an Initial Application:**

- A current county assessor's parcel map identifying the area's adjoining landowners;
- A copy of the notice of intent to participate in the program published in a paper of general circulation in the area affected and a copy of the certified letters and applications sent to each adjoining landowner notifying them of intent to participate in the program.

**I certify that all habitat improvements specified in my/our management plan have been completed, and I understand that failure to complete agreed upon activities may result in reduced authorized harvest and/or removal from the program.**

ALL APPLICANTS/OWNERS MUST SIGN BELOW. If more space is needed please use reverse for signature area. If the applicant is not the owner/fee title holder of the property, a signature is also required below by all owners/fee title holders of the property. By signing this license, the owners/fee title holders agree to allow the applicant to fulfill the terms and conditions of the license, and certify that all habitat work will be completed as agreed.

	Jon Warren, Manager	12-27-16
Applicant Signature	Title (owner, manager, etc.)	Date
	Title (owner, manager, etc.)	Date
Applicant Signature	Title (owner, manager, etc.)	Date
	Title (owner, manager, etc.)	Date
Applicant Signature	Title (owner, manager, etc.)	Date
	Title	Date
Owner / Fee Title Holder Signature (If different from Applicant)	Title	Date

**SAN SYSTEMS, INC.**

5558

California Department of Fish &amp; Wildlife

1/31/2017

Fee for JCL Private Lands Wildlife Habitat Management

1,807.00

### Checking B of A

1,807.00

17	MR
DEPARTMENT OF CALIFORNIA FREE PAYMENT MR ITEM Submit to appropriate DFG sales office for issuance	
	
SIC CODE: 102365410 - CALIFORNIA NO ACTIVE ID JERUSALEM CREEK FARMITE N 18651 LOYD LN ANDERSON CA 96007	
Date: 06/09/08 Name: JERUSALEM CREEK FARMITE N Address: 18651 LOYD LN City: ANDERSON State: CA Zip: 96007	Date: 06/09/08 Name: JERUSALEM CREEK FARMITE N Address: 18651 LOYD LN City: ANDERSON State: CA Zip: 96007
Date: 06/09/08 Name: JERUSALEM CREEK FARMITE N Address: 18651 LOYD LN City: ANDERSON State: CA Zip: 96007	Date: 06/09/08 Name: JERUSALEM CREEK FARMITE N Address: 18651 LOYD LN City: ANDERSON State: CA Zip: 96007

[illegible]



# **Jerusalem Ranch**

Proposal for  
The Private Lands Wildlife Habitat Enhancement  
And  
Management Area Program  
2017-2022

Submitted for

**Jon Warren**  
**Anderson, California**  
January 2017

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## INTRODUCTION

This plan has been prepared to partially meet the requirements for licensing the Jerusalem Creek Ranch, in the Private Lands Wildlife Habitat Enhancement and Management Area Program, authorized by Section 601, Title 14, California Code of Regulations, and issued by the California Department of Fish & Wildlife. The plan identifies existing wildlife habitat conditions, and outlines a five-year program to improve the habitat available for wildlife, with specific management aimed at enhancing conditions for the identified species.

The Jerusalem Creek Ranch is an ecologically diverse ranch which provides important habitat for a variety of wildlife species including big game, upland game, non-game, and several sensitive plant and animal species. As part of this plan, a partial list of wildlife species which are found on, or potentially utilizing the area, has been created using the Wildlife Habitat Relationships Database System (WHR) and can be found in Appendix 3.

The short and long-term objectives, outlined in more detail in the text, generally focus on the improvement of the property specifically to benefit wildlife. Additional objectives include developing a consumptive recreational use program including a sustainable harvest program, and decreasing hunter and OHV trespass occurrences. In addition, successful implementation of this plan will demonstrate the importance of this relatively small parcel, as a component, in supporting the critical wildlife habitat throughout the lower elevations of western Shasta County.

Management actions in this five-year plan are directed toward the following groups or species: Columbian black-tailed deer (*Odocoileus hemionus columbianus*) belonging to the deer management unit (DMU) 260 in the California Department of Fish & Wildlife's Deer Assessment Unit (DAU) 3; California quail (*Callipepla californicus*); Mourning dove (*Zenaida macroura*); and wild turkey (*Meleagris gallopavo*). The emphasis on these species is consistent with, and will assist the California Department of Fish & Wildlife in addressing established local wildlife management objectives and goals.

## DESCRIPTION OF AREA

The Jerusalem Creek Ranch is located in western Shasta County, approximately 6.5 miles west of Ono, on the eastern slope of the Yolla Bolly portion of the Klamath Mountains geomorphic province (Figure 1 & 2). The unit is comprised of approximately 728 deeded acres and falls within the Jerusalem Creek and Cottonwood Creek Watersheds. (See Appendix 1 for legal description). Portions of the ranch on the west and north border public access lands operated by Bureau of Land Management (BLM).

The topography of the ranch is typical of these foothill communities with relatively rugged, steep slopes, stemming from a series of ridges mostly lying in an east/west directional plane. Elevations on the ranch range from approximately 1430 to 2980 ft. The fall of the land is generally eastward down slope to the main stem of Cottonwood Creek. Soils are generally shallow, have low water holding capacity, and well drained on sedimentary, metasedimentary and granitic rock base formations.

The climate of the ranch is typical of the upper Sacramento Valley with hot, dry summers and cool to cold, wet winters. The majority of the precipitation comes in the form of rain at the lower elevations and snow at the upper reaches, and falls during the winter months. Some summer precipitation occurs, usually from passing thunderstorms. The average annual precipitation for the area is about 45 inches. The mean annual high temperature is about 70.5 ° F, while the mean annual low temperature is 43.0 ° F. The growing season is considered moderate at approximately 220 days from mid-March to mid-October.

## LAND USE PRACTICES

Human occupation of the area dates back approximately 12,500 years. The Wintu group, a hunter and gatherer society, used the area extensively. During post settlement periods, the entire area has been significantly impacted by human usage through mining, structure building, water regulation, fence construction, timber management, and livestock grazing.

The Jerusalem Creek Ranch has no known prehistoric sites, and has been historically used for grazing domestic livestock with some mining and timber harvest. The current ownership goes back 20+ years and only recreational activities (hiking, hunting, riding, etc.) have occurred during that period. A fire burned the area in the early 1950's. Some road construction has occurred resulting in approximately 1.1 miles of drivable surface. The ranch is zoned {Williamson act with a 40 ac minimum parcel size}. In addition, one artificial seasonal pond has been developed to improve water available for wildlife.

## LAND INVENTORY

The soils on the Jerusalem Creek Ranch are ancient sloping deposits. The soil types are generally from well drained parent materials, mostly gravelly loam to stony loam. Much of the soil contains high amounts of rock fragment. More productive land occurs along the watercourses, where narrow, but deep alluvial soils and a high water table are present. The substrate there is coarse, gravelly soils, more or less permanently moist, and usually well aerated. Plant species throughout the property are spatially distributed based on their ability to tolerate moisture and temperature gradients.

The ranch is a complex of diverse vegetative systems, however in general, can be classified under eight main habitat types. These habitat classifications, as defined within the California Wildlife Habitat Relationships (WHR) System, are described below, including approximate acreages.

**Montane Hardwood (MHW) - 325 Ac.** - This is the most common natural community on the ranch, occurring in a mosaic mix of seral stages and size class conditions. It is composed of a pronounced hardwood tree layer, with infrequent or scattered woody shrub and sparse herbaceous layers. Trees are closely spaced, with crowns that slightly overlap, forming a mainly closed canopy. Mostly later seral stages are present.

Wildlife species characteristic of MHW on the ranch include acorn disseminators as well as those species which utilize acorns as a major food source. Browsers moderately utilize the foliage of several of the hardwood species present, and a significant diversity of reptiles and amphibians use the detritus layer. (For example refer to the WHR list of species currently on file with the DFG).

**Montane Hardwood Conifer (MHC) - 125 Ac.** - This habitat occupies some of the steeper, northerly facing slopes on the ranch. MHC habitat includes both hardwood and conifer components in which neither falls below 33% of the total vegetative cover. On the Jerusalem Creek Ranch, it is typical in that the mosaic-like pattern includes small stands of pure conifers interspersed with small stands of broad leaved trees. Conifers dominating the type include ponderosa pine, Douglas fir, and sugar pine. The hardwood component includes California black oak, and canyon live oak.

MHC on the ranch provides habitat for a wide variety of wildlife species. Mature seral stages are valuable to cavity nesting birds, while mast crops throughout the ranch are an important food source for many species. Variable canopy cover and understory vegetation throughout the area are valuable for a diversity of species as well. Altitudinal and aspect variations result in different species use among similar stages.

**Chamise Redshank Chaparral (CRC) - 105 Ac.** - CRC is a relatively major component of the ranch, occupying a significant acreage. Generally it is a pure stand of chamise on the south xeric slopes, and mixed with other shrubs including *Ceanothus*, or white leaf manzanita, on northerly or easterly aspects. Overall this habitat type is in later seral stages due to a lack of fire or mechanical manipulation. The preferred seral stage for CRC is early, as younger shrubs provide better habitat values, cover, insect production, and herbaceous understory. This plan will address this condition.

Wildlife species associated with it vary depending on seral stage and frequency of fire treatment. Generally, older seral stages have led to declines in birds, mammals, and reptiles. Surveys on similar ranches have indicated that wildlife diversity and densities have reached a peak within the first three years after any fire treatment.

**Ponderosa Pine (PPN) - 55 Ac** - The vegetation of the PPN areas on the ranch are variable as well as structurally diverse. They tend to occur on north and east aspects with deeper soils, resulting in a varied understory. In general they are dominated by ponderosa pine overstory with an occasional mix of black oak or interior live oak. The understory is dependent on canopy closure, but often has moderate stands of shrub and herbaceous understory.

PPN on the Jerusalem Creek ranch has a moderate value for wildlife especially in areas with high snag presence. It provides thermal cover, migration corridors, and diverse roosting, nesting and feeding opportunities. A wide variety of birds, mammals, reptiles and amphibians rely on the PPN habitat on the ranch.

**Blue Oak - Foothill Pine (BOP) - 32 Ac** - BOP occurs primarily on the lower portions of the ranch on rocky, thin-soiled slopes. It occurs in older seral stage, and more open canopy closure. The overstory is primarily blue oak, with lesser amounts of foothill pine.

BOP on the Jerusalem Creek ranch has a high value for a diversity of game and non-game wildlife related mostly to its importance as a year around food resource. Additionally, it provides some cover values, but is very important in providing nesting structure for a wide variety of non-game bird species.

**Montane Chaparral (MCH) - 27 Ac.** - MCH on the Jerusalem Creek Ranch is primarily found on poorly drained, shallow soils. It is dominated by white leaf manzanita, but also has lesser amounts of *Ceanothus*, chemise, and poison oak. Mature stands tend to have little herbaceous growth due to canopy cover by the shrubs foliage. Like CRC, it responds well to fire and mechanical treatment.

Wildlife species associated with it again, vary depending on seral stage and frequency of fire treatment. Forb and herbaceous growth can be very abundant in earlier seral stages and provide valuable wildlife habitat. White leaf manzanita provides ample berries used by wildlife seasonally. Dense stands of MCH are used as escape cover by deer.

**Blue Oak Woodland (BOW) - 25 Ac.** - Blue oak woodland habitat is very similar to BOP but does not have the

presence of foothill pine in the overstory and tends toward less chaparral understory. On the ranch, it occurs on dryer, rocky slopes, and is an open seral stage with an annual grass and herbaceous understory.

Wildlife species associated with it again, are similar to BOP and vary depending on seral stage. Forb and herbaceous growth can provide valuable seasonal wildlife habitat, and decaying holes in the oaks provide critical nesting habitat for woodpeckers and other cavity nesting birds.

Small insignificant amounts of other habitat types are present including annual grass, Klamath Mixed Conifer, and Montane Riparian, and rock. In general, the areas where these are found are overshadowed by primary habitat types listed above in regards to major wildlife use patterns. However, these other habitat types do provide diversity and locally critical edge effect benefits for wildlife.

There is very little water on the ranch. Two year around spring sources exist however they do not run off and water goes underground very near the source. Cottonwood Creek flows through a small portion of the extreme eastern edge of the property.

#### WILDLIFE RESOURCES INVENTORY

A great diversity of wildlife species are associated with the varied habitats previously described and found on the ranch. A complete inventory of potential species found, as modeled using CWHR, has been included in this plan and will be on file at DFW offices in Redding and Sacramento. For purposes of the PLM Program, the ranch wildlife habitat improvement objectives will focus primarily on the specific wildlife outlined in the following paragraphs. However, habitat improvements will consider and benefit a wide variety of vertebrate and invertebrate wildlife species.

##### Columbian Black-tailed Deer

Black-tailed deer will be one of the main focuses of the ranch habitat enhancements. The Department of Fish & Wildlife considers the deer which utilize the Jerusalem Creek Ranch to be of two distinct groups. The first is a resident population which utilizes the area year-round and is considered non-migratory. The second group is of migratory origin and is part of the {Yolla Bolly} Deer Herd. This herd is now managed as part of the Northwestern California Deer Assessment Unit #3 (DAU 3), Deer Management Unit #260 (Yolla Bolly deer herd). The ranch is located in what is considered to be the winter range. In 1983, Loft et. al. estimated that approximately 80 percent of the deer are migratory.

Telemetry studies conducted by the CDFW in the 1980's indicate that deer that winter in the area, summer in the higher mountains to the west and as far north as the Trinity Alps. Currently, there are no estimates of the numbers of migratory deer using the ranch, however the resident component of the ranch has been estimated at 30 animals. The resident component is believed to be stable to slightly decreasing; (based on historical deer observations by sportsmen and landowners on the ranch) however no data is currently available after recent mechanical habitat manipulation.

Deer densities utilizing the ranch are highest during winter months and vary in location dependent on weather events, with deer moving lower during storms. During summer periods, deer tend to be found on the north facing slopes, utilizing the cooler mixed conifer habitats for thermal protection. No herd composition studies have



been performed therefore no definitive age or sex composition data is currently available, however ocular estimates by ranch owners indicate ratios near 20 bucks / 100 does. It is believed that the migratory component of DMU 260 is stable to slightly decreasing. Range condition trends have not been statistically measured; however previous habitat plans have estimated percent of habitat as cover near 70%, and only 30% forage. As no livestock have been on the ranch in its immediate history, heavily browsed forage can be attributed to deer. Using deer body condition and observed fawn production as indices, there is no indication that habitat or forage conditions are a limiting factor in the deer population.

No harvest data is available for the area prior to the current owners managing the ranch, but historic spot kill maps for Shasta County show sporadic harvest in the Jerusalem Creek area. The current owners report the ranch has averaged 1-3 bucks taken annually. While no antlerless harvest is being requested in the early years of this new plan, if deer body or habitat conditions indicate a population / habitat imbalance, the ranch will request a limited antlerless harvest from the DFW.

#### Quail

California quail are found widely throughout the ranch in small populations, especially in the MHW and MRI habitat types. The quail's requirement of a mosaic of low brushy vegetation with grass/ forb openings, in conjunction with water, makes the riparian stringers ideal for foraging and production. Movement patterns of California quail on the Jerusalem Creek ranch suggest that they require about twice the area in the winter months that they need in the summer months, and that production appears to be tied closely to fall rainfall and spring soil moisture. No estimates of current population levels are available.

#### Mourning Dove

Mourning doves are found throughout the ranch but appear in higher concentrations in open seral stages feeding on seeds, forbs and grasses. They can be found in all habitat types on the property, but move toward water twice per day. Dove populations vary seasonally, but increase during fall and winter from northern latitudes. While no specific reproductive data for the ranch exists, doves most likely nest multiple times during spring and summer. Doves avoid dense chaparral dominated habitat, therefore will benefit from mechanical or fire manipulation planned on the ranch. Currently, no estimates of dove populations exist for the property.

#### Wild Turkey

Wild turkeys occur on the ranch, but no specific data exists on the population's size, nor specific sex or age ratios. They are extremely nomadic and due to the smaller size of the ranch probably move on and off the property. During winter months they will be found in larger flocks, breaking into smaller sexually segregated groups during spring and summer. Turkeys require trees and open grassland as key habitat components, especially needing mature trees for night roosts. The habitat mosaic on the ranch currently provides roosting habitat, and proposed habitat manipulations will enhance quality and interspersed turkey feeding habitat. The diverse hardwood and conifer seral stages found on the ranch are a contributing factor in turkeys utilizing the property.

## HISTORIC HARVEST LEVELS

Little data exist documenting historic harvest levels for black-tailed deer, black bear, turkey, dove, or quail prior to participating in the PLM program the last five years. Deer harvest in the prior to the ranch coming under general big game hunting regulations for deer zone B-5, averaged 1-2 buck deer annually. Harvest of other species occurred sporadically. Participating in the PLM program and enhancing useable portions of the land for game species has had positive impact with noticeable increases (based on PLM participants observations) in game wildlife and small game. Black-tailed deer harvest has increased with 2-3 buck deer harvests annually. The ranch has seen 1-2 black bears, 2-3 turkeys, and a handful of doves and quail harvested in recent years.

## MANAGEMENT OBJECTIVES

The intent of the Jerusalem Creek Ranch's long term participation in the PLM Program is to provide quality habitat for a diversity of wildlife resources, while maintaining a sustainable, recreational property. The primary purpose of this management plan is to provide goals which direct actions toward the ranch's intent. To provide a mechanism for accomplishing these goals, the objectives outlined below have been established. Objectives for some secondary wildlife species are not listed or identified because habitat enhancements for the primary species will benefit the secondary species as well.

Deer, quail, doves, and turkeys are the target species for management on the Jerusalem Creek Ranch. The objectives of the habitat improvement projects are to improve the wintering and foraging habitat for deer, improve foraging and nesting cover habitats for quail, improve foraging and maintain nesting habitat for doves, and improve foraging and maintain roosting habitat for turkeys.

Therefore, to facilitate the improvement of these key habitat components for diversity of game and non-game wildlife species, and to provide quality, diversity, and stability in all habitat serial stages, the following habitat improvement projects are to be completed annually over the next 5-year period.

## PROPOSED HABITAT IMPROVEMENT PRACTICES

The following habitat enhancements will be performed over the 5-year license period in order to meet the previously stated goals and objectives. Each project is to be done annually:

- 1) Mechanically treat a minimum of 5 acres decadent *Ceanothus*, or white leaf manzanita brush per year.
- 2) Clear, pile, and burn has been the best method to accomplish versus prescribed burning to accomplish juvenile regrowth. Beginning in year 2, burn previously mechanically treated areas or untreated areas utilizing prescribed fire protocols. A minimum of 5 acres will be burned per year pending burn conditions.
- 3) Maintain two spring sources in years 1-5. This includes removal of Himalayan blackberries around the spring (20') and continued maintenance of water catchments (-natural pond areas we expanded at sources).
- 4) Thin a minimum of 5 acres per year of overgrown interior live oak habitats in years 1-5 to create stump sprouting that will provide wildlife forage. On average, 20% of oaks will be thinned by cutting 1-2 -weaker, branching trunks from multi-trunked trees.

Habitat Enhancement Annual Schedule  
Jerusalem Creek Ranch: 2017- 2022

<u>Habitat Enhancement</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2022</u>
<u>Mechanically Treat Brush</u>	<u>5 ac</u>	<u>5 ac</u>	<u>5 ac</u>	<u>5 ac</u>	<u>5 ac</u>
<u>Burn Treated Brush</u>	<u>5 ac</u>	<u>5 ac</u>	<u>5 ac</u>	<u>5 ac</u>	<u>5 ac</u>
<u>Water source</u> <u>Enhancement</u>	<u>Maintain</u>	<u>maintain</u>	<u>maintain</u>	<u>maintain</u>	<u>maintain</u>
<u>Thinning</u>	<u>5 ac</u>	<u>5 ac</u>	<u>5 ac</u>	<u>5 ac</u>	<u>5 ac</u>

SUGGESTED HARVEST STRATEGY

All hunting on the Jerusalem Creek Ranch will take place under PLM approval and guidelines or under general Department of Fish & Wildlife regulations. Deer will be the only species harvested under PLM licensing.

Columbian black-tailed deer hunting will only be done by individuals possessing an appropriate PLM tag. No antlerless harvest is being requested during the early years for the plan. The proposed seasons and harvest levels for the 2017 – 2022 license period will be as follows:

Deer: open with the archery deer season for the surrounding deer hunt zone (B5) August 1 and run continuously through November 30 annually.

Harvest level year 1-5: 4 buck deer tags to take 3 buck deer

STATEMENTS OF CONSENT

- a. Leased Lands –(Need statement here about any leases on the property)
- b. Roads or Right-of Ways – Implementation of the Jerusalem Creek Ranch management plan will not restrict public access to public lands. No known right of ways exist on the ranch.
- c. Compliance Checks – The Department Wildlife Program personnel will be provided access annually to the plan area at times mutually agreeable to the Department and applicant for the purpose of reviewing implementation of the PLM. During the PLM hunting season, Department Wildlife Officers will be provided access in order to ensure compliance with hunting laws and regulations. Access will be in the form of either a combination lock, keys to gates, or by allowing Department Wildlife Officers to place a lock on the gate during the PLM hunting season.

- d. Record Keeping - Records regarding the Jerusalem Creek Ranch PLM Program will be kept at the Jerusalem Creek Ranch headquarters, 18631 Lloyd Lane, Anderson, California, and will be made available for inspection to the DFW upon request.

## APPENDIX 1

### Jerusalem Creek Ranch - Legal Description

T30N R8W

Section 13: all

Section 18: N1/2 and the SE ¼, and W1/2 of the W1/2 of the SW ¼;

**APPENDIX 4**  
**Habitat Enhancement Annual Schedule**  
**Jerusalem Creek Ranch: 2017- 2022**

<b>Habitat Enhancement</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2022</b>
Mechanically Treat Brush	5 ac	5 ac	5 ac	5 ac	5 ac
Burn Treated Brush	5 ac	5 ac	5 ac	5 ac	5 ac
Water source Enhancement	Maintain	maintain	maintain	maintain	maintain
Thinning	5 ac	5 ac	5 ac	5 ac	5 ac

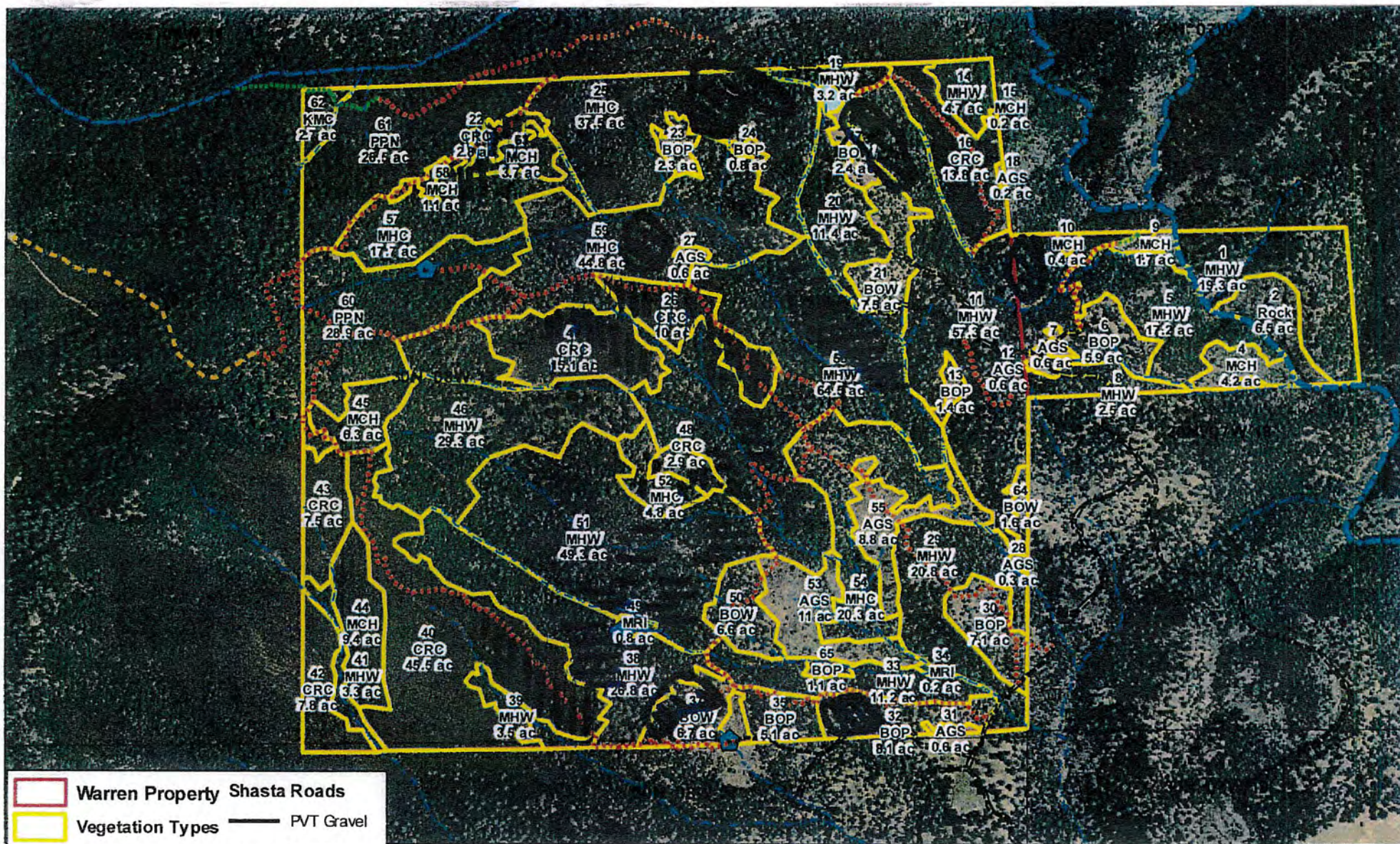


**FIGURE 1 - Jerusalem Creek Ranch Overview**

**FIGURE 2 - Jerusalem Creek Ranch Detail**

**APPENDIX 3 – CWHR Species List**





## Warren Vegetation Types Map 3

1:12,000

0 100 1,000 2,000 3,000 4,000 Feet



Created by  
Jeff Webster  
1/10/12



Commissioners  
Eric Sklar, President  
Saint Helena  
Jacque Hostler-Carmesin, Vice President  
McKinleyville  
Anthony C. Williams, Member  
Huntington Beach  
Russell E. Burns, Member  
Napa  
Peter S. Silva, Member  
Chula Vista

STATE OF CALIFORNIA  
Edmund G. Brown Jr., Governor

Valerie Termini, Executive Director  
1418 Ninth Street, Room 1320  
Sacramento, CA 95814  
(916) 653-4899  
[www.fgc.ca.gov](http://www.fgc.ca.gov)

## Fish and Game Commission



*Wildlife Heritage and Conservation  
Since 1870*

July 7, 2016

Mr. Jon Warren  
Jerusalem Creek Ranch  
P.O. Box 491942  
Redding, CA 96049

Dear Mr. Jon Warren:

At the Fish and Game Commission's June 22-23, 2016, meeting in Bakersfield, your ranch's Private Lands Wildlife Habitat Enhancement and Management Area Plan (PLM) was approved.

Please see the enclosed documents for details about your approved seasons, harvests, and habitat improvements.

Sincerely,

Valerie Termini  
Executive Director

Enclosure

cc: Department of Fish and Wildlife  
Stafford Lehr, Deputy Director, Wildlife and Fisheries Division  
Garry Kelley Acting Branch Chief, Wildlife Branch  
Neil Manji, Northern Region  
Tina Bartlett, North Central Region  
Scott Wilson, Bay Delta Region  
Julie Vance, Central Region  
Leslie MacNair, Inland Deserts Region  
Ed Pert, South Coast Region  
Victoria Barr, Wildlife Branch  
Lai Saechao, License and Revenue Branch  
Kelli Linker, License and Revenue Branch

**PLM AREA LICENSE**  
**ANNUAL RENEWALS, 2016/2017**  
**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<b>NORTHERN REGION</b>		
3D RANCH  DEER ZONE B5  TEHAMA  1,732 ACRES	<p><b>Authorized Harvest:</b> 7 buck deer, forked horn or better and 5 bear</p> <ul style="list-style-type: none"> <li>• Issue 7 buck deer tags for the period of August 15, 2016 through November 30, 2016.</li> <li>• No more than 4 buck deer may be harvested after October 23, 2016.</li> <li>• Issue 5 bear tags for the period of August 15, 2016 through December 25, 2016. The season ending date may be earlier, if the Department determines that the annual quota has been reached.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Mechanically crush 15 acres of decadent brush to improve forage for wildlife.</li> <li>➤ Maintain a total of 7 acres of forage plots planted with legumes and clover by replanting as necessary and irrigating.</li> <li>➤ Maintain 4 water sources to provide water for wildlife by checking for broken pipes and repairing as necessary.</li> <li>➤ Remove at least ¼ mile of unnecessary interior fencing to prevent wildlife entanglement.</li> <li>➤ Improve 2 reservoirs by sealing leaks and dams.</li> </ul>
ALEXANDRE ECODAIRY FARMS PLM  DEL NORTE  1,728 ACRES	<p><b>Authorized Harvest:</b> 2 bull elk and 4 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 2 bull elk tags for the period of September 1, 2016 through December 31, 2016.</li> <li>• Issue 4 antlerless elk tags for the period of October 1, 2016 through December 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Create 5 acres of perennial wetlands by using heavy equipment to excavate areas and modify existing surface drainage.</li> <li>➤ Plant 15 Sitka spruce seedlings adjacent to the wetlands and install an elk-proof fence to protect these young trees.</li> </ul>
AMANN RANCH  MENDOCINO  369 ACRES	<p><b>Authorized Harvest:</b> 1 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 1 bull elk tag for the period of August 1, 2016 through November 30, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Irrigate at least 60 acres of pasture for use by wildlife.</li> <li>➤ Maintain 16 water troughs by ensuring they are holding adequate water for wildlife.</li> <li>➤ Leave unharvested the 2<sup>nd</sup> cutting of hay on 342 acres. This will retain approximately 500 tons of forage accessible to elk.</li> <li>➤ Install 1 rail-type elk fence crossing. The top cross rail will be no higher than 48" above the ground to accommodate adult elk and the bottom cross rail will be no lower than 22" to facilitate crossing by elk calves.</li> </ul>

**PLM AREA LICENSE**  
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**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<p>ASH VALLEY RANCH</p> <p>DEER ZONE X3A</p> <p>LASSEN</p> <p>8,736 ACRES</p>	<p><b>Authorized Harvest:</b> 4 buck deer, forked horn or better and 1 pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 4 buck deer tags for the period August 20, 2016 through November 30, 2016.</li> <li>• Issue 1 buck pronghorn antelope tag for the period of August 6, 2016 through September 30, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove encroaching conifers from a 25 acre aspen stand.</li> <li>➤ Remove at least 2 acres of noxious weeds by grubbing and/or chemical application.</li> <li>➤ Through the use of rotational grazing prescriptions, retain approximately 50% of the forage in Pasture A for wildlife use.</li> </ul>
<p>BIG BLUFF RANCH</p> <p>DEER ZONE B5</p> <p>TEHAMA</p> <p>3,736 ACRES</p>	<p><b>Authorized Harvest:</b> 8 deer of which no more than 5 may be forked horn or better buck deer and 3 may be antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 8 either-sex deer tags for the period of August 15, 2016 through November 30, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain the Red Bank Restoration Project improvements (native vegetation restoration of 30 acres along 3 miles of creek) by repairing any damage to the livestock control fencing and irrigating until plants are fully established.</li> <li>➤ Maintain the water development at Miller Place as needed to provide water for wildlife by repairing any damage to the system.</li> <li>➤ Irrigate 35 acres of permanent pasture for wildlife use.</li> <li>➤ Maintain the wildlife friendly fence below Sunflower Dam to exclude livestock and allow wildlife access to wetlands.</li> <li>➤ Fill a 500 gallon water trough and 3,000 gallon storage tank as needed to provide water for livestock and wildlife away from riparian areas.</li> <li>➤ Participate in the Sunflower Conservation Resource Management Plan which is creating additional wildlife habitat on the surrounding 40,000 acres.</li> </ul>
<p>BIG LAGOON PLM</p> <p>HUMBOLDT</p> <p>109,367 ACRES</p>	<p><b>Authorized Harvest:</b> 3 bull elk and 2 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 3 bull elk tags for the period of August 15, 2016 through October 31, 2016.</li> <li>• Issue 2 antlerless elk tags for the period of October 1, 2016 through October 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ All habitat projects have been completed under the Big Lagoon PLM 5-year management plan (contributing and delivering logs and associated root wads to a stream restoration site). Therefore, no habitat work is required during this license year.</li> </ul>

**PLM AREA LICENSE**  
**ANNUAL RENEWALS, 2016/2017**  
**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
CAPISTRAN RANCH  DEER ZONE B1  MENDOCINO  13,200 ACRES	<p><b>Authorized Harvest:</b> 20 deer of which no more than 15 may be forked horn or better buck deer and 5 may be antlerless deer; 2 bull elk, 2 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 10 either-sex deer tags for the period of August 1, 2016 through November 30, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> <li>• No more than 10 buck deer may be harvested after October 23, 2016.</li> <li>• On or before October 23, 2016, the licensee may request (in writing) up to 10 additional either-sex tags to accomplish the authorized harvest.</li> <li>• Issue 2 bull elk tags for the period of August 1, 2016 through December 1, 2016.</li> <li>• Issue 2 antlerless elk tags for the period of September 15, 2016 through December 1, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Shorten the livestock grazing period to October 15, 2016 through June 20, 2017 (from year- round grazing) to increase residual vegetation for wildlife and, where necessary, manage invasive plants by focused high intensity short term grazing. The stocking rate will be held at 200 cow/calf pairs on the 13,200 acres.</li> <li>➤ Maintain 10 springs by checking the flow and wildlife escape ramps and repairing any damaged parts.</li> <li>➤ Exclude trespass livestock from USFS and BLM grazing allotments by inspecting and repairing the boundary fence.</li> <li>➤ Replace the nesting material in 3 bluebird nest boxes. Boxes will be relocated if not used the previous season.</li> <li>➤ Construct, install, and maintain 3 wood duck nest boxes.</li> <li>➤ Construct a brush pile for wildlife cover and oak seedling protection. The piles will be created using slash from down trees and brush. The piles will be 20 feet in diameter and at least 5 feet high when created. Piles will be located near a routinely used water source.</li> <li>➤ Maintain and monitor 3 approximately 1,000 sq. ft. food plots spread out over the property and in areas where green summer browse is limited. Each food plot is fenced from cattle and wild pigs. Each will have a motion sensing camera to record the day and night deer activity. The annual report will include a table of total number and composition of deer photographed.</li> <li>➤ Using a tractor, create a 6 foot wide and 300 foot long trail through decadent chaparral to provide access and new palatable forage for wildlife.</li> </ul>



**PLM AREA LICENSE**  
**ANNUAL RENEWALS, 2016/2017**  
**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<p>CARLEY RANCH</p> <p>DEER ZONE B1</p> <p>MENDOCINO</p> <p>1,660 ACRES</p>	<p><b>Authorized Harvest:</b> 22 deer of which no more than 15 may be forked horn or better buck deer and 7 may be antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 10 either-sex deer tags for the period of August 1, 2016 through November 30, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> <li>• No more than 7 buck deer may be harvested after October 23, 2016.</li> <li>• On or before October 15, 2016, the licensee may request up to 12 additional either-sex deer tags to accomplish the authorized harvest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ All previously developed water sources (3 springs and 4 guzzlers; guzzlers total 3200 gallons) will be maintained to provide water wildlife. Annual maintenance at water sources includes repairing broken and deteriorating pipes and other components.</li> <li>➤ Cattle grazing will be used to help remove thatch buildup of medusa head and other nonnative grasses. Cattle will be limited to 30 head and grazing will only occur from December through May.</li> <li>➤ Maintain the wildlife-friendly livestock exclusion fencing around developed springs by repairing any damage.</li> <li>➤ Reseed a 5 acre dryland food plot if current alfalfa, chicory, and plantain crop has less than 50% cover.</li> <li>➤ The previously planted 1 acre alfalfa food plot will be irrigated during the dry season. Food plot is fenced with wildlife-friendly fencing to exclude livestock.</li> <li>➤ Brush rake removal of 15 acres of decadent chamise to improve browse and reduce fire hazard.</li> </ul>
<p>CHRISTENSEN RANCH</p> <p>DEER ZONE B1</p> <p>MENDOCINO</p> <p>1,061 ACRES</p>	<p><b>Authorized Harvest:</b> 22 deer of which no more than 15 may be forked horn or better buck deer and 7 may be antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 22 either-sex deer tags for the period of August 1, 2016 through November 30, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> <li>• No more than 7 buck deer may be harvested after October 23, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain a well on the property to fill the numerous water tanks that provide water to troughs for wildlife use.</li> <li>➤ Annually check 6 developed springs and repair any broken water pipes.</li> <li>➤ Irrigate the ¼ acre and the ½ acre <i>Brassica</i> forage plots to provide green forage during summer, and reseed areas that are sparsely vegetated.</li> <li>➤ Plant <i>Brassica</i> seed in the fall by manually seeding and raking in fresh pig rooting areas. The extent of this activity will depend on pig activity but is expected to represent at least 6 sites this year, scattered throughout the ranch.</li> <li>➤ Exclude cattle from the PLM area.</li> <li>➤ Improve fish habitat in Woodman Creek by continuing to work with California Trout and State Agencies on the Woodman Creek Barrier Removal Project. Open access through the PLM property to the project proponents will be provided through 2018.</li> </ul>

**PLM AREA LICENSE**  
**ANNUAL RENEWALS, 2016/2017**  
**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
COTTRELL RANCH  DEER ZONE B1  HUMBOLDT  6,500 ACRES	<p><b>Authorized Harvest:</b> 15 deer of which no more than 10 may be antlerless deer, 1 bull elk, and 1 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 15 either-sex deer tags for the period of July 15, 2016 through December 15, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> <li>• No more than 7 buck deer may be harvested after October 23, 2016.</li> <li>• Buck deer must be forked horn or better.</li> <li>• Issue 1 bull elk tag for the period of August 1, 2016 through December 15, 2016.</li> <li>• Issue 1 antlerless elk tag for the period of September 15, 2016 through December 15, 2016.</li> </ul>	<p>➤ Remove encroaching conifers from at least 40 acres of oak woodlands in sections 25, 28, 29, 30, 31, 32, 33, or 36.</p>
DIAMOND C OUTFITTERS  DEER ZONE B1  HUMBOLDT  3,200 ACRES	<p><b>Authorized Harvest:</b> 17 deer of which no more than 10 may be antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 17 either-sex deer tags for the period of July 15, 2016 through December 15, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> <li>• No more than 7 buck deer may be harvested after October 23, 2016.</li> <li>• Buck deer must be forked horn or better.</li> </ul>	<p>➤ Remove encroaching conifers from at least 20 acres of oak woodlands in Tracts 1, 3, or 4.</p>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<p>FIVE DOT RANCH - HORSE LAKE</p> <p>DEER ZONE X5A</p> <p>LASSEN</p> <p>8,025 ACRES</p>	<p><b>Authorized Harvest:</b> 1 buck deer, forked horn or better and 1 buck pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 1 buck deer tag for the period of September 17, 2016 through November 30, 2016.</li> <li>• Issue 1 buck pronghorn antelope tag for the period of August 6, 2016 through September 20, 2016.</li> <li>• No person shall take more than 1 buck deer annually in the X zones.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Rehabilitate a spring and riparian vegetation on 20 acres by excluding cattle, installing a water storage tank and troughs, and removing juniper from 80 acres surrounding the spring.</li> <li>➤ Livestock grazing of the 300-acre Packard Field will be deferred until after July 1<sup>st</sup> to improve duck and goose brood survival. Grazing will occur between July 2, 2016 and October 2, 2016.</li> <li>➤ Maintain 5 goose nesting platforms at Packard Reservoir and Coon Camp Reservoir as needed.</li> <li>➤ Monitor willow plantings along Pine Creek and Coon Camp Creek and replant new willows if survival of previous year's plantings is less than 80%.</li> <li>➤ Knock seed off bitterbrush plants in the fall so cattle can stomp them into the ground to regenerate them. New bitterbrush growth will be monitored annually.</li> </ul>
<p>FIVE DOT RANCH - TUNNEL SPRINGS</p> <p>DEER ZONE X5A</p> <p>LASSEN</p> <p>2,600 ACRES</p>	<p><b>Authorized Harvest:</b> 1 buck deer, forked horn or better and 2 buck pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 1 buck deer tag for the period of September 17, 2016 through November 30, 2016.</li> <li>• Issue 2 buck pronghorn antelope tags for the period of August 13, 2016 through September 25, 2016.</li> <li>• No person shall take more than 1 buck deer annually in the X zones.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Repair damaged livestock-exclusion fencing with wildlife friendly fencing at Tunnel Springs.</li> <li>➤ Maintain at least 50 percent of the current year's water capacity in 2 reservoirs for wildlife by filling the reservoirs with water.</li> <li>➤ Remove 100 junipers from around Tunnel Springs and the reservoirs.</li> <li>➤ Knock seed off bitterbrush plants in the fall so cattle can stomp them into the ground to regenerate them. New bitterbrush growth will be monitored annually.</li> <li>➤ Maintain the solar panel water pump system that keeps 12 water troughs full to provide water for wildlife.</li> </ul>
<p>FIVE DOT RANCH - WILLOW CREEK</p> <p>DEER ZONE X4</p> <p>LASSEN</p>	<p><b>Authorized Harvest:</b> 7 buck deer, forked horn or better and 2 buck pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 8 buck deer tags to take 7 buck deer for the period of September 17, 2016 through November 30, 2016. Of those tags, 1 shall be provided to an apprentice hunter.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Repair damaged livestock-exclusion fencing around 4 aspen and willow stands totaling 30 acres that provide deer fawning habitat.</li> <li>➤ Crush at least 25 acres of snowbrush to provide new forage at different sites in Sections 21, 22, 27, or 28.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<p>7,200 ACRES</p> <p>FIVE DOT RANCH - WILLOW CREEK CONT.</p>	<ul style="list-style-type: none"> <li>• Issue 2 buck pronghorn antelope tags for the period of August 13, 2016 through September 25, 2016.</li> <li>• No person shall take more than 1 buck deer annually in the X zones.</li> <li>• In no case shall the number of tags issued be used to exceed the authorized harvest.</li> <li>• The number of tag holders actively hunting shall not exceed the number of deer available to harvest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Exclude livestock grazing on 50 acres of native sagebrush vegetation in the Triangle Field for sage-grouse and other sagebrush dependent species.</li> <li>➤ Retain water in reservoirs and ponds at 50% of the current water year's capacity for wildlife by filling them as needed.</li> <li>➤ Leave the 3<sup>rd</sup> cutting of alfalfa on 100 acres for deer and pronghorn antelope use.</li> <li>➤ Allow deer to utilize a 50 acre field of alfalfa and grass.</li> <li>➤ Maintain 4 goose nesting platforms at Round Valley Reservoir.</li> </ul>
<p>FOUR PINES RANCH</p> <p>DEER ZONE B1</p> <p>MENDOCINO</p> <p>2,001 ACRES</p>	<p><b>Authorized Harvest:</b> 12 buck deer, forked horn or better and 4 antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 12 buck deer tags to take forked horn or better buck deer and 4 antlerless deer tags for the period of July 16, 2016 through November 30, 2016.</li> <li>• No more than 6 buck deer may be harvested after October 23, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain 5 previously improved springs and 2 existing ponds.</li> <li>➤ Develop 1 spring in section 1, 7, 11, 12, or 13.</li> <li>➤ Plant ¼ acre forage plot in section 1, 7, 11, 12, or 13 with legumes and vetch for wildlife use.</li> <li>➤ Treat ½ acre of invasive weeds in section 1, 7, 11, 12, or 13, by hand manipulation or herbicides, to allow native vegetation to grow.</li> <li>➤ Remove 100 feet of interior fence to enhance wildlife passage in section 1, 7, 11, 12, or 13.</li> <li>➤ Create ¼ acre browse opening through dense brush in section 1, 7, 11, 12, or 13 to enhance wildlife access to forage.</li> <li>➤ Remove encroaching conifers in ¼ acre of oak woodlands in section 1, 7, 11, 12, or 13.</li> <li>➤ Restrict livestock grazing to no more than 50 head of cattle during the winter and spring.</li> <li>➤ Plant 50 willow shoots at existing water sources; improve existing willow patches by trimming to encourage growth.</li> <li>➤ Create at least 3 new brush piles annually for wildlife cover.</li> </ul>
<p>FULTON RANCH</p> <p>HUMBOLDT</p> <p>2,844 ACRES</p>	<p><b>Authorized Harvest:</b> 1 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 1 bull elk tag for the period of September 1, 2016 through October 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ All habitat projects have been completed under the Fulton Ranch 5-year management plan (removal of encroaching conifers from oak woodlands). Therefore, no habitat work is required during this license year.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<p>HUNTER RANCH</p> <p>DEER ZONE B1</p> <p>HUMBOLDT</p> <p>16,103 ACRES</p>	<p><b>Authorized Harvest:</b> 20 deer of which no more than 5 may be antlerless deer and 1 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 20 either-sex deer tags for the period of July 15, 2016 through November 30, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> <li>• Buck deer must be forked horn or better.</li> <li>• No more than 7 buck deer may be harvested after October 23, 2016.</li> <li>• Issue 1 bull elk tag for the period September 1, 2016 through September 30, 2016.</li> </ul>	<p>➤ All habitat projects have been completed under the Hunter Ranch 5-year management plan. Therefore, no habitat work is required during this license year.</p>
<p>JERUSALEM CREEK RANCH</p> <p>DEER ZONE B5</p> <p>SHASTA</p> <p>726 ACRES</p>	<p><b>Authorized Harvest:</b> 4 buck deer, forked horn or better</p> <ul style="list-style-type: none"> <li>• Issue 4 buck deer tags for the period of August 1, 2016 through November 30, 2016.</li> </ul>	<p>➤ Maintain 2 water sources to provide water for wildlife by checking for broken pipes and repairing as necessary.</p> <p>➤ Plant 5 acres in areas previously treated for brush with a grass/vetch seed mix to provide forage for wildlife.</p> <p>➤ Thin at least 15 acres of dense thickets of stunted live oak trees by severing the trunks at the bottom. The new shoots provide high-quality forage for wildlife.</p>
<p>JS RANCH</p> <p>DEER ZONE C3</p> <p>SHASTA</p> <p>6,500 ACRES</p>	<p><b>Authorized Harvest:</b> 12 buck deer, forked horn or better and 1 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 12 buck deer tags for the period of August 1, 2016 through November 30, 2016.</li> <li>• No more than 6 buck deer may be harvested after October 23, 2016.</li> <li>• Issue 1 bull elk tag for the period of August 1, 2016 through November 30, 2016.</li> </ul>	<p>➤ Maintain ½ mile of riparian livestock exclusion fencing by inspecting and repairing any damage.</p> <p>➤ Inspect and repair check dams in irrigation canals. Water is kept in canals year round and is accessible to wildlife.</p> <p>➤ Mechanically control the spread of extensive blackberry thickets within a 650 acre area. Bramble margins and some interior areas will be cut or crushed.</p> <p>➤ Install water bars on dirt roads adjacent to Cow Creek to prevent sediment erosion.</p> <p>➤ Exclude livestock from 345 acres (bringing the total exclusion area to 1000 acres) from June 1 through October 31.</p> <p>➤ Irrigate 650 acres to provide forage for wildlife during late summer and early fall.</p>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
JS RANCH CONT.		<ul style="list-style-type: none"> <li>➤ Irrigate 50 acres of pasture on the Rock Garden Flats to provide elk forage, and exclude cattle from June 8 to October 1.</li> <li>➤ Remove a minimum of ½ mile of interior fencing to enhance wildlife movement.</li> <li>➤ Add 5 new wood duck boxes and maintain 30 existing wood duck boxes. Check all boxes for use annually on Old Cow Creek and Clover Creek.</li> <li>➤ Retain vegetation for wildlife cover along irrigation canal banks to the extent it does not interfere with ditch maintenance.</li> <li>➤ Prohibit commercial firewood cutting on the property.</li> <li>➤ Maintain a 200 acre fenced area with no human disturbance or cattle grazing for wildlife use year-round.</li> <li>➤ Enhance and maintain 2 ponds by enlarging and repairing spillways and dams and making any other necessary repairs.</li> </ul>
KLAMATH PLM HUMBOLDT  32,594 ACRES	<p><b>Authorized Harvest:</b> 3 bull elk and 2 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 3 bull elk tags for the period of September 1, 2016 through October 31, 2016.</li> <li>• Issue 2 antlerless elk tags for the period of October 1, 2016 through October 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove encroaching conifers from 360 acres of oak woodlands and prairies. All conifer stems less than or equal to 8 inches diameter at breast height will be removed.</li> </ul>
LOOKOUT RANCH  DEER ZONE X1  MODOC  6,880 ACRES	<p><b>Authorized Harvest:</b> 6 buck deer and 1 buck pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 6 buck deer tags for the period of September 1, 2016 through November 30, 2016.</li> <li>• No person shall take more than 1 buck deer annually in the X zones.</li> <li>• Issue 1 buck pronghorn antelope tag for the period of September 1, 2016 through September 30, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Renovate and re-level at least 80 acres of wild rice to improve water storage for waterfowl.</li> <li>➤ Remove western juniper from 3 acres at Moon Pasture.</li> <li>➤ Plant 250 willows in the Buck Pasture draw below the 3<sup>rd</sup> pond and 250 willows in the southwest corner of the marsh.</li> <li>➤ Plant alfalfa and wild rice to establish an additional 10 acres of wildlife food plots.</li> <li>➤ Manage acreage enrolled in Wetland Reserve Program for wildlife.</li> <li>➤ Build at least 5 brush piles in the Moon Pasture to provide escape cover for wildlife.</li> </ul>



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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
MENDIBOURE RANCH  DEER ZONE X5B  LASSEN  8,840 ACRES	<p><b>Authorized Harvest:</b> 3 buck deer, forked horn or better and 1 buck pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 6 buck deer tags to take 3 buck deer for the period of September 17, 2016 through October 16, 2016.</li> <li>• Issue 1 buck pronghorn antelope tag for the period of August 27, 2016 through September 11, 2016.</li> <li>• No person may take more than 1 buck deer annually in the X zones.</li> <li>• In no case shall the number of tags issued be used to exceed the authorized harvest.</li> <li>• The number of tag holders actively hunting shall not exceed the number of deer available to harvest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain aspen and willow livestock exclosure fencing at Ethcheopar Spring, Van Loan Creek, and Big Springs by checking and repairing fencing if needed.</li> <li>➤ Expand the Ethcheopar aspen exclosure to protect suckers outside the existing fence.</li> <li>➤ Maintain 3 aspen and willow livestock exclosures by checking and repairing any damage to the wildlife friendly fencing.</li> <li>➤ Create a 15 acre dryland alfalfa plot for wildlife. Construct a wildlife friendly fence to exclude cattle from the plot.</li> <li>➤ Cut 150 mountain mahogany branches with ripe seeds to recruit young plants.</li> <li>➤ Remove junipers from 5 acres to improve shrub and forb recruitment.</li> </ul>
MILLER-ERIKSEN RANCH  DEER ZONE B1  MENDOCINO  1,000 ACRES	<p><b>Authorized Harvest:</b> 25 deer of which no more than 17 may be forked horn or better buck deer and 8 may be antlerless deer; 1 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 13 either-sex deer tags for the period of July 16, 2016 through November 30, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> <li>• No more than 9 buck deer may be harvested after October 23, 2016.</li> <li>• On or before November 1, 2016, the licensee may request (in writing) up to 12 additional either-sex tags to accomplish the authorized harvest.</li> <li>• The number of deer tag holders actively hunting shall not exceed the number of deer available to harvest.</li> <li>• Issue 1 bull elk tag for the period of August 1, 2016 through November 30, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Plant 200 willow cuttings to provide food and cover for wildlife.</li> <li>➤ Maintain 3 springs to provide additional water for wildlife.</li> <li>➤ Construct 2 new elk fence crossings to provide access for elk.</li> <li>➤ Hand thin at least ½ acre of understory conifer and decadent browse species to provide forage for wildlife.</li> <li>➤ Plant 100 pounds of grass seed mix to provide food and cover for wildlife.</li> <li>➤ Maintain the reduced number of livestock, not to exceed 25 cow/calf pairs.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
PEPPERWOOD SPRINGS RANCH  DEER ZONE B1  HUMBOLDT  22,000 ACRES	<p><b>Authorized Harvest:</b> 30 buck deer, forked horn or better</p> <ul style="list-style-type: none"> <li>Issue 30 buck deer tags to take forked horn or better buck deer for the period of July 15, 2016 through November 30, 2016.</li> <li>No more than 15 buck deer may be harvested after October 23, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove encroaching conifers from at least 40 acres of oak woodlands.</li> </ul>
POTTER VALLEY WILDLIFE MANAGEMENT AREA  MENDOCINO  7,767 ACRES	<p><b>Authorized Harvest:</b> 6 bull elk and 10 antlerless elk</p> <ul style="list-style-type: none"> <li>Issue 2 bull elk tags for the period of August 6, 2016 through December 1, 2016.</li> <li>Issue 5 antlerless elk tags for the period of September 15, 2016 through December 1, 2016.</li> <li>On or before October 12, 2016, the licensee may request (in writing) up to 4 bull tags and 5 additional antlerless tags to accomplish the authorized harvest.</li> <li>The number of tag holders actively hunting shall not exceed the number of elk available to harvest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Irrigate the 5-acre permanent pastures on the Guntly Cold Creek subunit to provide summer forage for wildlife.</li> <li>➤ Maintain the livestock exclusion fence around the 5-acre permanent pasture on the Guntly Cold Creek subunit.</li> <li>➤ Maintain the livestock exclusion fence along 1.4 miles of the Russian River.</li> <li>➤ Maintain the livestock exclusion fence on the 4 acre pond on the Mathews subunit.</li> <li>➤ Continue reduced livestock numbers at 120 cow/calf pairs.</li> <li>➤ Maintain all elk crossings.</li> <li>➤ Maintain 9 springs.</li> <li>➤ Maintain the bull elk wallow.</li> <li>➤ Maintain the new water system which includes a well, 2,000 gallon storage tank, a pump, a generator and a 500 gallon water trough to provide water for elk.</li> <li>➤ Fertilize 10 acres of rangeland pasture to increase forage for wildlife.</li> <li>➤ Maintain the 825 acre livestock exclusion on the Guntly Cold Creek Subunit.</li> </ul>
RAINBOW RIDGE PLM  HUMBOLDT  DEER ZONE B4  20,321 ACRES	<p><b>Authorized Harvest:</b> 15 buck deer, forked horn or better</p> <ul style="list-style-type: none"> <li>Issue 15 buck deer tags for the period of August 1, 2016 through November 30, 2016.</li> <li>No more than 8 buck deer may be harvested after October 2, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove encroaching conifers from at least 20 acres of oak woodlands and prairies.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
RED ROCK RANCH LASSEN DEER ZONE X3B 6,887 ACRES	<p><b>Authorized Harvest:</b> 7 buck deer forked horn or better and 2 buck pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 7 buck deer tags for the period of October 1, 2016 through October 16, 2016.</li> <li>• Issue 2 buck pronghorn antelope tags for the period of August 20, 2016 through August 28, 2016.</li> <li>• No person shall take more than one buck deer annually in the X zones.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain the livestock fencing at 2 springs near Windy Flat to exclude livestock.</li> <li>➤ Maintain a spring box at Windy Flat by checking and repairing any damaged parts.</li> <li>➤ Inspect and make any necessary repairs to the livestock exclusion fencing around 2 aspen and willow stands that provide deer fawning habitat.</li> <li>➤ Remove western juniper from 15 acres in Red Rock Valley and Neuland area to enhance shrub recruitment.</li> <li>➤ Construct a new aspen enclosure in Neuland area to exclude livestock grazing and encourage the development of additional fawning habitat.</li> <li>➤ Use rotational grazing to rest at least 1 meadow for wildlife cover and forage.</li> </ul>
REDWOOD HOUSE RANCH DEER ZONE B1 HUMBOLDT 8,419 ACRES	<p><b>Authorized Harvest:</b> 20 buck deer, forked horn or better and 1 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 20 buck deer tags for the period of the August 20, 2016 through November 30, 2016.</li> <li>• No more than 7 buck deer may be harvested after October 23, 2016.</li> <li>• Issue 1 bull elk tag for the period of September 17, 2016 through October 9, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove encroaching conifers from at least 40 acres of oak woodlands and prairies.</li> </ul>
ROBERTS RANCH DEER ZONE X1 MODOC 2,313 ACRES	<p><b>Authorized Harvest:</b> 2 buck deer, forked horn or better</p> <ul style="list-style-type: none"> <li>• Issue 2 buck deer tags for the period of October 1, 2016 through November 30, 2016.</li> <li>• No person shall take more than 1 buck deer annually in the X zones.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove 200 western junipers (less than 6 inches diameter at breast height) at locations where juniper was removed previously to create more forage for wildlife.</li> <li>➤ In a separate portion of the ranch, remove western junipers from at least 3 acres.</li> <li>➤ Maintain all previously developed springs, levees, and ponds by ensuring that recent earthwork (levees, water control structures and pipes) continue to function as designed.</li> <li>➤ Restrict cattle grazing to a level much reduced from what occurred prior to the current ownership to no more than 50 cow/calf pairs.</li> </ul>

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SCHNEIDER RANCH DEER ZONE B1 MENDOCINO 4,222 ACRES	<p><b>Authorized Harvest:</b> 9 buck deer, forked horn or better</p> <ul style="list-style-type: none"> <li>• Issue 9 buck deer tags for the period of August 1, 2016 through November 30, 2016.</li> <li>• No more than 4 buck deer may be harvested after October 23, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain the 1-acre irrigated forage plot at Marks Place, which provides valuable summer forage and also contributes subsurface water to an additional 8 acres downslope. Maintenance includes weed control, soil management, and ensuring the functionality of the water supply system.</li> <li>➤ Cultivate with tractor equipment and irrigate the 1 acre Cabin food plot, which provides a year round deer feeding area.</li> <li>➤ Create 6 brush piles for wildlife cover. The piles will each be approximately 10 feet in diameter and 6 feet tall and will provide good habitat for both deer and quail.</li> <li>➤ Burn 6 brush piles. The remnant charcoal and ashes are nutrient rich and deer roll in them, perhaps for control of external parasites.</li> <li>➤ Cut/hinge at least 10 smaller sub-canopy oaks so they droop to a point where branches are within reach of deer.</li> <li>➤ Inspect 8 previously improved springs and repair any damaged parts, clear any brush that is intruding on the collection galleries, cleaning out accumulated debris and mud, and ensure the box is structurally sound.</li> <li>➤ Excluding all livestock from the ranch, including regular fence maintenance in order to prohibit trespass cattle from USFS and BLM grazing allotments.</li> </ul>
SL RANCH DEER ZONE X3A MODOC 7,500 ACRES	<p><b>Authorized Harvest:</b> 4 buck deer, forked horn or better and 1 buck pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 4 buck deer tags for the period of August 15, 2016 through November 15, 2016.</li> <li>• Issue 1 buck pronghorn antelope tag for the period of August 1, 2016 through September 30, 2016.</li> <li>• No person shall take more than 1 buck deer annually in the X zones.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Use a combination of chainsaws and herbicides to remove western juniper in a 500 acre area adjacent to the BLM property.</li> <li>➤ Flood 400 acres of wild rice for waterfowl use after harvest.</li> <li>➤ Maintain the livestock exclusion fence around the spring below Likely Mill to to exclude cattle.</li> <li>➤ Maintain 2 springs on Rocky Prairie and 1 pond by ensuring that fencing excludes cattle. Any damaged fences and structures will be repaired as necessary.</li> <li>➤ Maintain the livestock exclusion fencing along the West Side Canal where willows are present. Fences and structures will be repaired as necessary.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
SMITH RIVER PLM  HUMBOLDT  24,949 ACRES	<p><b>Authorized Harvest:</b> 3 bull elk and 6 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 3 bull elk tags for the period of September 1, 2016 through October 31, 2016</li> <li>• Issue 6 antlerless elk tags for the period of October 1, 2016 through October 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Enhance coho salmon habitat by harvesting and delivering 25 large, merchantable trees to a permitted stream restoration site on Rowdy Creek. The trees will be used and installed as in-stream large, woody debris structures.</li> </ul>
SPRING VALLEY RANCH  DEER ZONE A  MENDOCINO  4,860 ACRES	<p><b>Authorized harvest:</b> 24 buck deer forked horn or better, and 4 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 24 buck deer tags for the period of August 1, 2016 through November 30, 2016.</li> <li>• No more than 8 buck deer may be harvested after September 20, 2016.</li> <li>• Issue 4 bull elk tags for the period of August 1, 2016 through November 30, 2016.</li> <li>• On or before October 15, 2016, the licensee may request (in writing) up to 1 additional bull elk tag to complete the authorized harvest.</li> <li>• In no case shall the number of tags issued be used to exceed the authorized harvest.</li> <li>• The number of tag holders actively hunting shall not exceed the number of deer available to harvest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Create 2, 10 ft. x 6 ft. brush piles.</li> <li>➤ Remove 1.5 acres of Scotch Broom and coyote brush by mechanically removing with a tractor and by hand.</li> <li>➤ Remove and manipulate 0.5 acres of blackberries by tractor, by hand, and with the use of herbicide. Treatment areas will be monitored to determine the most effective method of removal and manipulation.</li> <li>➤ Mechanically remove with a tractor and by hand, 0.5 acre of decadent manzanita to improve wildlife forage.</li> <li>➤ Construct one rail-type fence crossing for elk. The top cross rail will be no higher than 48" above the ground to accommodate adult elk and the bottom cross rail will be no lower than 22" to facilitate crossing by elk calves.</li> <li>➤ Repair existing elk crossings as necessary.</li> <li>➤ Inspect and if necessary repair the 9 previously improved water development projects.</li> <li>➤ Develop 1 new spring. The spring will be dug out and collector boxes will be used. Water will be piped to troughs.</li> <li>➤ Remove at least 1,000 feet of woven wire cross fencing to reduce wildlife entanglement.</li> <li>➤ Maintain a 5 acre pond for use by migratory birds and other wildlife, including large mammals. The pond provides year-round water, as well as roosting, feeding, and nesting habitat.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
STACKHOUSE RANCH  SHASTA  DEER ZONE C3  400 ACRES	<p><b>Authorized Harvest:</b> 2 buck deer forked horn or better, or 1 buck deer forked horn or better deer and 1 antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 3 either-sex deer tags for the period of September 1, 2016 through November 30, 2016.</li> <li>• No more than 1 buck deer may be harvested after October 23, 2016.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> <li>• In no case shall the number of tags issued be used to exceed the authorized harvest.</li> <li>• The number of tag holders actively hunting shall not exceed the number of deer available to harvest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Repair incised and leaking headwall of the dam at the lower pond to provide water for wildlife.</li> <li>➤ Add 4 new wood duck boxes at the Lower and Upper Ponds.</li> <li>➤ Plant at least 1-2 willow and alder stems every 8 feet around the edge of the Barn Pond to provide cover for wildlife.</li> <li>➤ Maintain 7 acres of meadow by removing invasive blackberries to provide forage for wildlife.</li> <li>➤ Enhance 43 acres of conifer habitat by spraying to control noxious weeds and blackberries.</li> <li>➤ Retain at least 3 acres of young native shrub and herbaceous vegetation in a 43 acre thinned conifer stand by not treating with herbicides.</li> </ul>
STEWART RANCH  DEER ZONE B1  TRINITY  11,006 ACRES	<p><b>Authorized Harvest:</b> 36 buck deer, forked horn or better and 5 antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 36 buck deer tags for the period of August 1, 2016 through November 30, 2016. Of those tags, 10 shall be provided to apprentice hunters.</li> <li>• Issue 5 antlerless deer tags for the period of September 15, 2016 through November 30, 2016.</li> <li>• No more than 18 buck deer may be harvested after October 23, 2016.</li> <li>• On or before October 15, 2016, the licensee may request (in writing) up to 5 additional buck tags to accomplish the authorized harvest.</li> <li>• In no case shall the number of tags issued be used to exceed the authorized harvest.</li> <li>• The number of tag holders actively hunting shall not exceed the number of deer available to harvest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove encroaching conifers from at least 20 acres of oak woodland.</li> <li>➤ Replant 4 irrigated food plots consisting of clover, chicory, and brassica totaling 10 acres to provide forage for wildlife.</li> <li>➤ Replant 31 acres of dry land forage plots in grain and forbs to provide forage for wildlife.</li> <li>➤ Maintain electric livestock exclusion fencing around all fenced food plots.</li> <li>➤ Install 1 wood duck nest box along Kekawaka Creek.</li> <li>➤ Check use and replace nesting material in 15 wood duck nest boxes.</li> <li>➤ Maintain 8 water sources (ponds and springs) with cattle exclusion fencing by inspecting and repairing any damaged parts.</li> <li>➤ Plant 25 willow or alder stems around 8 water sources if needed to regenerate riparian cover for wildlife.</li> <li>➤ Maintain ½ mile of livestock exclusion fencing along Kekawaka Creek to improve riparian vegetation by inspecting and repairing any damaged parts.</li> </ul>



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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<p>STOVER RANCH</p> <p>HUMBOLDT</p> <p>7,000 ACRES</p>	<p><b>Authorized Harvest:</b> 4 bull elk and 2 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 4 bull elk tags for the period September 1, 2016 through October 31, 2016.</li> <li>• Issue 2 antlerless elk tags for the period October 1, 2016 through October 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove encroaching conifers from at least 80 acres of oak woodlands.</li> </ul>
<p>SUMMER CAMP RANCH</p> <p>DEER ZONE B1</p> <p>MENDOCINO</p> <p>38,502 ACRES</p>	<p><b>Authorized Harvest:</b> 80 buck deer, forked horn or better and 1 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 80 buck deer tags for the period of July 9, 2016 through November 30, 2016.</li> <li>• Issue 1 bull elk tag for the period of July 9, 2016 through November 30, 2016.</li> <li>• No more than 40 buck deer may be taken after October 23, 2016.</li> <li>• On or before October 15, 2016, the licensee may request (in writing) up to 20 additional buck deer tags and 1 additional bull elk tag to accomplish the authorized harvest.</li> <li>• In no case shall the number of tags issued be used to exceed the authorized harvest.</li> <li>• The number of deer tag holders actively hunting shall not exceed the number of deer available to harvest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain 3 irrigated wildlife forage areas, totaling 12 acres.</li> <li>➤ Improve 1 spring by cleaning out and installing an off-site water trough.</li> <li>➤ Exclude livestock from 1 spring by installing at least 300 square feet of wildlife-friendly fencing.</li> <li>➤ Maintain 2 riparian exclusion areas totaling ¾ acre and plant willows.</li> <li>➤ Maintain 13 developed springs.</li> <li>➤ Exclude livestock grazing from mid-June through October.</li> <li>➤ Remove encroaching conifers from at least 10 acres of oak woodlands.</li> <li>➤ Construct a minimum of 20 brush piles within oak woodland habitat.</li> <li>➤ Maintain approximately 7 miles of riparian fencing on the Eel River and repair any damage.</li> <li>➤ Maintain a minimum of 10 miles of road to prevent sedimentation into the Eel River system. Road maintenance will generally include grading roads, pulling inside ditches where they exist, shaping the road surface to promote proper drainage, and maintenance of drainage facilities such as cross drains and culverts.</li> <li>➤ Burn 10 acres of grasslands to rejuvenate vegetation.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
TRAVIS RANCH  DEER ZONE B1  TRINITY  11,907 ACRES	<p><b>Authorized Harvest:</b> 15 deer of which no more than 5 may be antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 15 either-sex deer tags for the period of July 15, 2016 through November 30, 2016.</li> <li>• Buck deer must be forked horn or better.</li> <li>• No antlerless deer shall be harvested before September 15, 2016.</li> <li>• No more than 7 buck deer may be harvested after October 23, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove encroaching conifers from at least 20 acres of oak woodland in Area E.</li> <li>➤ Construct a spring in Area H.</li> <li>➤ Retain at least 5 slash piles for use as wildlife cover.</li> <li>➤ Treat at least 70 acres of yellow star thistle with herbicide and biological controls in Areas J and F.</li> </ul>
WIGGINS RANCH  HUMBOLDT  16,657 ACRES	<p><b>Authorized Harvest:</b> 2 bull elk and 2 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 2 bull elk tags for the period of September 1, 2016 through October 31, 2016.</li> <li>• Issue 2 antlerless elk tags for the period of October 1, 2016 through October 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove encroaching conifers from at least 40 acres of oak woodlands.</li> </ul>
<b>NORTH CENTRAL REGION</b>		
LLANO SECO RANCHO  DEER ZONE C4  BUTTE  14,500 ACRES	<p><b>Authorized Harvest:</b> 25 buck deer, forked horn or better and 10 antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 25 buck deer tags to take forked horn or better buck deer and 10 antlerless deer tags to take 10 antlerless deer for the period of September 1, 2016 through November 30, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Treat 1,150 acres of Yellow Star and Bull Thistle.</li> <li>➤ Fall seeding of vetch, rye grass, and oats in thistle treatment areas.</li> <li>➤ Grow 1,079 acres of dryland wheat.</li> <li>➤ Maintain or replace 50 existing wood duck and barn owl nest boxes.</li> <li>➤ Install 2 pond turtle basking structures in ponds or backwater areas near river.</li> <li>➤ Coordinate with CDFW Deer Program on annual deer surveys and captures for CDFW Sacramento River Deer Herd Survey and Study.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<b>BAY DELTA REGION</b>		
<p>CONNOLLY AND CORRAL HOLLOW RANCH</p> <p>SAN JOAQUIN</p> <p>11,758 ACRES</p>	<p><b>Authorized Harvest:</b> 1 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 1 bull elk tag for the periods of August 1, 2016 through October 1, 2016 and November 15, 2016 through December 15, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Provide 800 acres of grasslands on the Connolly Ranch for exclusive use by elk from July through March.</li> <li>➤ Provide 480 acres of grasslands on the Corral Hollow Ranch for exclusive use by elk.</li> <li>➤ Continue to implement a rotational cattle grazing regime to provide adequate forage for elk.</li> <li>➤ Fell 3 acres of gray pines to provide additional forage for elk and to increase cover for small mammals, birds and reptiles. Trees will be felled outside bird breeding season (March 1 – June 30) and any trees with bird of prey nests shall be avoided altogether.</li> </ul>
<b>CENTRAL REGION</b>		
<p>ALEXANDER RANCH</p> <p>DEER ZONE A</p> <p>MONTEREY</p> <p>786 ACRES</p>	<p><b>Authorized Harvest:</b> 1 bull elk, 2 antlerless elk and 1 buck deer forked horn or better</p> <ul style="list-style-type: none"> <li>• Issue 1 bull elk tag for the period of July 2, 2016 through December 31, 2016.</li> <li>• Issue 2 antlerless elk tags for the period of August 15, 2016 through December 31, 2016.</li> <li>• Issue 1 buck deer tag to take a forked horn or better buck deer for the period July 2, 2016 through November 30, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain existing springs, troughs and reservoirs to provide water for wildlife.</li> <li>➤ Limit cattle stocking rate to 75 animals to enhance and provide habitat and feed for wildlife.</li> <li>➤ Create 5 brush piles for use by wildlife.</li> <li>➤ Burn or brush crush 5 acres of brush to stimulate new forage growth for elk and other wildlife.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<p>AVENALES RANCH</p> <p>SAN LUIS OBISPO</p> <p>11,300 ACRES</p>	<p><b>Authorized Harvest:</b> 4 bull elk, 3 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 2 bull elk tags for the period of July 15, 2016 through December 31, 2016.</li> <li>• Issue 2 antlerless elk tags for the period of September 15, 2016 through December 31, 2016.</li> </ul> <p>Note: Avenales Ranch is not requesting their full allocation of tags.</p>	<ul style="list-style-type: none"> <li>➤ Fence off "Surprise Springs" to protect it from cattle. Upgrade the water lines as needed.</li> <li>➤ Clean out dove nest cones that were installed in Douglas Canyon in 2013 and add 15 more nest cones.</li> <li>➤ Install a new water trough by "Turtle Pond" for wildlife only. Install wildlife access and escape ramps in the trough.</li> <li>➤ Install a new 1500 gal. water storage tank to supply year round water to the "35 canyon" area.</li> <li>➤ Maintain and repair projects as needed that were built in 2011.</li> </ul>
<p>CAMP 5 OUTFITTERS - ROTH RANCH PLM</p> <p>DEER ZONE A</p> <p>MONTEREY AND SAN LUIS OBISPO COUNTIES</p> <p>5,400 ACRES</p>	<p><b>Authorized Harvest:</b> 1 bull elk, 1 antlerless elk, 6 buck deer forked horn or better and 3 antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 1 bull elk tag for the period of July 2, 2016 through December 31, 2016.</li> <li>• Issue 1 antlerless elk tag for the period of August 15, 2016 through December 31, 2016.</li> <li>• Issue 2 buck deer tags for the period of July 9, 2016 through July 31, 2016 (Zone A, Archery) and August 13, 2016 through September 25, 2016 (Zone A, General).</li> </ul> <p>Note: Roth Ranch is not requesting their full allocation of tags.</p>	<ul style="list-style-type: none"> <li>➤ Clear 5 acres of old growth brush to stimulate growth of new forage for wildlife.</li> <li>➤ Re-seed 5 acre cleared area with appropriate range mix.</li> <li>➤ Adapt 1 existing water source to make it more wildlife accessible.</li> <li>➤ Maintain and improve water system.</li> <li>➤ Build 3-5, 100 square foot brush piles to provide cover for wildlife.</li> <li>➤ No grazing allowed in the 40 acre riparian area.</li> <li>➤ Plant 10 acres of barley or other suitable cover crop for wildlife use.</li> <li>➤ No grazing on the Fowler or Roth Ranches.</li> <li>➤ Install 1 elk crossing in the Roth Ranch fence line or where best utilized on the other ranches to facilitate elk movement between properties.</li> </ul>
<p>CARNAZA RANCH</p> <p>SAN LUIS OBISPO</p> <p>8,475 ACRES</p>	<p><b>Authorized Harvest:</b> 3 bull elk and 3 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 3 bull elk tags for the period July 15, 2016 through December 31, 2016.</li> <li>• Issue 3 antlerless elk tags for the period of September 1, 2016 through December 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Plant 100 acres of dryland barley for use by wildlife.</li> <li>➤ Pump water to 5 water troughs on a year-round basis to provide water for wildlife.</li> <li>➤ Plant 10 willows to enhance wildlife habitat.</li> <li>➤ Construct 3 brush piles to enhance habitat for upland game.</li> </ul>

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<p>CARRIZO RANCH</p> <p>SAN LUIS OBISPO</p> <p>11,040 ACRES</p>	<p><b>Authorized Harvest:</b> 3 bull elk; 4 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue up to 3 bull elk tags for the period of July 15, 2016 through December 31, 2016.</li> <li>• Issue up to 4 antlerless elk tags for the period of September 1, 2016 through December 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Plant 10, 1-gallon trees and 10, 1-gallon shrubs in the Big Spring Riparian area to enhance wildlife habitat.</li> <li>➤ Install 1 upland game guzzler.</li> <li>➤ Create 3 brush piles to enhance habitat for upland game.</li> <li>➤ Install 1 new wildlife watering trough.</li> </ul>
<p>CHIMNEY ROCK RANCH</p> <p>DEER ZONE A</p> <p>SAN LUIS OBISPO</p> <p>6,500 ACRES</p>	<p><b>Authorized Harvest:</b> 3 bull elk, 10 buck deer forked horn or better</p> <ul style="list-style-type: none"> <li>• Issue 3 bull elk tags for the period July 1, 2016 through December 31, 2016.</li> <li>• Issue 16 buck deer tags to take no more than 10 forked horn or better buck deer for the period beginning with the opening day of archery season, July 9, 2016 through November 30, 2016. At the request of the licensee on or before October 26<sup>th</sup>, 2016 the licensee may request an addition of 4 deer tags to accomplish the authorized harvest.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Continue with the solar pump project in the "Triangle" pasture to provide water for wildlife.</li> <li>➤ Defer cattle from the "Lake" pasture from mid-spring through mid-summer to allow cover for ground nesting birds to grow out and in turn enhance forage for wildlife.</li> <li>➤ Maintain existing water sources to provide water for wildlife.</li> <li>➤ Construct 10 brush piles for use as cover for wildlife.</li> </ul>
<p>CLARK AND WHITE RANCH</p> <p>SAN LUIS OBISPO</p> <p>5,660 ACRES</p>	<p><b>Authorized Harvest:</b> 3 bull elk and 2 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 1 bull elk tag for the period of July 15, 2016 through December 15, 2016.</li> <li>• Issue 1 antlerless elk tag for the period of August 15, 2016 through December 15, 2016.</li> </ul> <p>Note: Clark and White Ranch is not requesting their full allocation of tags.</p>	<ul style="list-style-type: none"> <li>➤ Plant 1,000 acres of barley for use by elk and other wildlife.</li> <li>➤ Repair 1 dam to increase standing water and enhance riparian/marsh habitats.</li> <li>➤ Install 3 brush piles around existing springs for quail.</li> <li>➤ Plant 1-acre of quail brush near springs for use by upland game.</li> </ul>
<p>D- RAFTER- "L" RANCH, LLC</p> <p>SAN LUIS OBISPO</p> <p>3,156 ACRES</p>	<p><b>Authorized Harvest:</b> 1 bull elk and 1 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 1 bull elk tag for the period July 1, 2016 through December 31, 2016.</li> <li>• Issue 1 antlerless elk tag for the period August 15, 2016 through December 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain brush piles 1-4 by adding new brush to enhance cover for wildlife.</li> <li>➤ Plant 10 acres of barley or other forage mix to enhance cover and forage for wildlife.</li> <li>➤ Install 1 elk crossing in appropriate section of fence behind the ranch house.</li> </ul>

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PLM Area	Proposed Season and Harvest	Habitat Improvement Program
HARTNELL RANCH  DEER ZONE A  MONTEREY  4,600 ACRES	<p><b>Authorized Harvest:</b> One bull elk, 2 antlerless elk and 2 buck deer forked horn or better</p> <ul style="list-style-type: none"> <li>• Issue 1 bull elk tag for the period of July 2, 2016 through December 31, 2016.</li> <li>• Issue 2 antlerless elk tags for the period August 15, 2016 through December 31, 2016.</li> <li>• Issue 2 buck deer tags to take forked horn or better buck deer for the period of July 2, 2016 through November 30, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Burn or brush crush 10 acres to promote new forage growth for wildlife.</li> <li>➤ Maintain existing springs, troughs and reservoirs to provide water for wildlife.</li> <li>➤ Create 8 brush piles for use by wildlife.</li> <li>➤ Limit cattle stocking rate to 250 animals to enhance and maintain habitats for wildlife.</li> <li>➤ Install 1 elk crossing in appropriate location in fence line.</li> </ul>
HEARST RANCH  SAN LUIS OBISPO  5,381 ACRES	<p><b>Authorized Harvest:</b> 2 bull elk and 5 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 2 bull elk tags for the period of July 15, 2016 through December 31, 2016.</li> <li>• Issue 5 antlerless elk tags for the period of September 1, 2016 through December 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Irrigate 152 acres of pasture for year round use by wildlife.</li> <li>➤ Maintain livestock exclusionary fencing on 105 acres (2.5 miles of fencing) of riparian pasture during periods of stream flow to enhance fishery and wildlife habitat.</li> <li>➤ Treat and remove 1-acre of nonnative Scotch Broom to enhance habitat for native plants and animals.</li> <li>➤ Treat and remove 1-acre of nonnative Jubata grass to enhance habitat for native plants and animals.</li> <li>➤ Install 2 upland game guzzlers</li> </ul>
LEWIS RANCH  SAN BENITO  512 ACRES	<p><b>Authorized Harvest:</b> 1 bull elk, 1 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 1 bull elk tag for the period of July 15, 2016 through December 31, 2016.</li> <li>• Issue 1 antlerless elk tag for the period of August 15, 2016 through December 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ No cattle grazing on 512 acres to provide high quality habitat for tule elk, quail and other wildlife.</li> <li>➤ Maintain perennial water in 4 guzzlers, their tanks and troughs for use by wildlife.</li> <li>➤ Maintain 12 brush piles in areas "A", "B" and "C" for use by wildlife.</li> <li>➤ Plant areas 1, 2 and 3 with barley to provide supplemental food for wildlife.</li> <li>➤ Service 3 owl and 3 wood duck nest boxes for the upcoming nesting season.</li> </ul>



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<p>MORISOLI RANCH</p> <p>MONTEREY AND SAN BENITO COUNTIES</p> <p>14,700 ACRES</p>	<p><b>Authorized Harvest:</b> 4 bull elk and 4 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 3 bull elk tags for the period of July 2, 2016 through December 31, 2016.</li> <li>• Issue 3 antlerless elk tags for the period August 15, 2016 through December 31, 2016.</li> </ul> <p>Note: Morisoli ranch is not requesting their full allocation of tags.</p>	<ul style="list-style-type: none"> <li>➤ Build 1 elk crossing.</li> <li>➤ Construct 5 brush piles for use by wildlife.</li> <li>➤ Develop 1 new water source for wildlife.</li> <li>➤ Build and install 1 bird nest box.</li> <li>➤ Plant 10 acres of forage mix for use by wildlife.</li> <li>➤ Clear 5 acres of old growth brush to stimulate new forage growth for use by wildlife.</li> <li>➤ Seed cleared areas with barley/vetch mixture to provide additional forage for wildlife.</li> </ul>
<p>ROOSTERCOMB RANCH</p> <p>DEER ZONE A SOUTH</p> <p>STANISLAUS</p> <p>4,862 ACRES</p>	<p><b>Authorized Harvest:</b> 4 buck deer, forked horn or better and 1 bull elk</p> <ul style="list-style-type: none"> <li>• Issue 4 buck deer tags for the period of August 13, 2016 through November 27, 2016.</li> <li>• Issue 1 bull elk tag for the period of September 10, 2016 through December 31, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Clear up to 20 acres of decadent brush in all areas.</li> <li>➤ Use brush for quail habitat.</li> <li>➤ Reseed Areas C &amp; D with wild rye or grains.</li> <li>➤ Plant 30-40 acres with wild rye or vetch/forage mixes in Areas A &amp; B.</li> <li>➤ Maintain all water sources.</li> <li>➤ Maintain fences and elk crossings.</li> </ul>

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**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<p>TEJON RANCH</p> <p>DEER ZONE D-11</p> <p>KERN AND LOS ANGELES COUNTIES</p> <p>270,000 ACRES</p>	<p><b>Authorized Harvest:</b> 50 buck deer, 5 antlerless deer, 12 bull elk, 3 cow elk, 10 bearded turkeys</p> <ul style="list-style-type: none"> <li>• Issue 40 either sex deer tags including 20 tags for the period of September 24, 2016 through November 6, 2016, harvest quota shall be 25 in the regular season and 25 in the extended season.</li> <li>• On or before October 25, 2016, the licensee may request (in writing) up to 10 either sex deer tags to accomplish the authorized harvest.</li> <li>• Issue 5 antlerless deer tags for the season of September 24, 2016 through December 31, 2016. Harvest quota of 5 antlerless deer.</li> <li>• Issue 10 bearded turkey tags for the season of March 18, 2017 through May 21, 2017.</li> <li>• Issue 12 bull elk tags for the season of September 1, 2016 through December 31, 2016.</li> <li>• Issue 3 cow elk tags for the season of September 1, 2016 through December 31, 2016.</li> <li>• No person shall take more than 1 buck deer or 1 bull elk.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain wildlife guzzlers, use of mechanical means to fill guzzlers.</li> <li>➤ Continue installation of wildlife escape ramps in livestock troughs.</li> <li>➤ Install 1.5 miles of new riparian habitat fencing, cattle grazing management.</li> <li>➤ Maintain netted open top water tanks and spring containments.</li> <li>➤ Install 6 new water troughs and improved livestock water systems.</li> <li>➤ Continue collaboration with the Tejon Conservancy with invasive weed control, feral pig management study (USDA, Tejon Ranch, Tejon Conservancy), additional NRCS rangeland projects.</li> </ul>
<p>TEMBLOR RANCH</p> <p>SAN LUIS OBISPO AND KERN</p> <p>30,000 ACRES</p>	<p><b>Authorized Harvest:</b> 7 bull elk; 12 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 7 bull elk tags for the period of July 15, 2016 through December 31, 2016.</li> <li>• Issue 12 antlerless elk tags for the period of September 1, 2016 through December 31, 2016.</li> <li>• Upon request of the licensee on or prior to November 1, 2016, the licensee may request up to 7 additional bull elk tags and 12 additional antlerless elk tags to accomplish the authorized harvest of not more than 19 elk.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Plant 100 acres of barley at 100 lbs./acre for elk and pronghorn.</li> <li>➤ Install ½ mile of pipeline to provide water for wildlife.</li> <li>➤ Construct 1 holding pond for use by wildlife</li> </ul>

**PLM AREA LICENSE**  
**ANNUAL RENEWALS, 2016/2017**  
**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
TRINCHERO RANCH  SAN BENITO  4,452 ACRES	<p><b>Authorized Harvest:</b> 3 bull elk, 1 antlerless elk</p> <ul style="list-style-type: none"> <li>• Issue 2 bull elk tags for the period of July 15, 2016 through December 31, 2016.</li> </ul> <p>Note: Trinchero Ranch is not requesting their full allocation of tags.</p>	<ul style="list-style-type: none"> <li>➤ Limited cattle grazing on approximately 4,000 acres in Black and Red Mountain pastures from December through May.</li> <li>➤ Chemically control tamarisk in Long Canyon to improve habitat for wildlife.</li> <li>➤ Construct 4-6 brush piles for use by wildlife.</li> <li>➤ Burn 4 old decadent brush piles and reseed the areas with grasses and legumes.</li> </ul>
WORK RANCH  DEER ZONE A  MONTEREY  19,500 ACRES	<p><b>Authorized Harvest:</b> 2 bull elk, 4 antlerless elk, 6 buck deer forked horn or better, and 2 antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 2 bull elk tags for the period of July 2, 2016 through December 31, 2016.</li> <li>• Issue 4 buck deer tags and 4 either sex deer tags to take no more than 6 forked horn or better bucks and 2 antlerless deer for the period of July 2, 2016 through November 30, 2016.</li> </ul> <p>Note: Work Ranch is not requesting their full allocation of tags.</p>	<ul style="list-style-type: none"> <li>➤ Continue to practice holistic range management to maintain high quality habitats for wildlife.</li> <li>➤ Plant 200 acres of barley or appropriate forage crop for wildlife.</li> <li>➤ Maintain all existing water points for use by wildlife.</li> <li>➤ Maintain existing Conservation Reserve Program contracts to maintain high quality habitats for wildlife.</li> <li>➤ Rehabilitate 1 upland bird guzzler.</li> <li>➤ Construct 10 brush piles to provide cover for wildlife.</li> </ul>

**PLM AREA LICENSE**  
**NEW 5-YEAR MANAGEMENT PLANS, 2017-2022**  
**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<b>NORTHERN REGION</b>		
<p>ASH VALLEY RANCH</p> <p>DEER ZONE X3A</p> <p>LASSEN</p> <p>8,736 ACRES</p>	<p><b>Authorized Harvest:</b> 4 buck deer forked horn or better and 1 pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 6 buck deer tags for the period October 7, 2017 through November 30, 2017.</li> <li>• No person shall take more than 1 buck deer annually in the X zones.</li> <li>• In no case shall the number of tags issued be used to exceed the authorized harvest.</li> <li>• The number of tag holders actively hunting shall not exceed the number of deer available to harvest.</li> <li>• Issue 1 buck pronghorn antelope tag for the period of August 5, 2017 through September 30, 2017.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove at least 20 acres of noxious weeds by grubbing and/or chemical application.</li> <li>➤ Through the use of rotational grazing prescriptions, maintain previously completed habitat restoration work.</li> <li>➤ Replace 0.5 mile of perimeter fence with wildlife-friendly fence.</li> </ul>
<p>EL RANCHO RIO FRIO</p> <p>DEER ZONE B5</p> <p>TEHAMA</p> <p>12,682 ACRES</p>	<p><b>Authorized Harvest:</b> 24 buck deer forked horn or better</p> <ul style="list-style-type: none"> <li>• Issue 24 buck deer tags for the period of August 15, 2017 through November 30, 2017.</li> <li>• No more than 12 deer may be harvested after October 22, 2017.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Install 2 10,000-gallon guzzlers to provide additional water for wildlife.</li> <li>➤ Burn 300-500 acres of decadent shrubs (mostly chamise) to enhance deer habitat.</li> <li>➤ Develop a 3-acre irrigated forage plot by first ripping to dislodge brush and then spraying brush sprouts with herbicide. Seed any mechanically disturbed areas with a mix of perennial grasses and annual clovers.</li> </ul>
<p>JERUSALEM CREEK RANCH</p> <p>DEER ZONE B5</p> <p>SHASTA</p> <p>726 ACRES</p>	<p><b>Authorized Harvest:</b> 4 buck deer forked horn or better</p> <ul style="list-style-type: none"> <li>• Issue 4 buck deer tags for the period of August 1, 2017 through November 30, 2017.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain 2 water sources that provide water for wildlife by checking for broken pipes and repairing as necessary.</li> <li>➤ Thin at least 5 acres of dense thickets of stunted interior live oak trees by, on average, cutting 1-2 weaker, branching trunks from multi-trunk trees. The new shoots provide high-quality forage for wildlife.</li> </ul>

**PLM AREA LICENSE**  
**NEW 5-YEAR MANAGEMENT PLANS, 2017-2022**  
**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<p>LOOKOUT RANCH</p> <p>DEER ZONE X1</p> <p>MODOC</p> <p>6,880 ACRES</p>	<p><b>Authorized Harvest:</b> 6 buck deer forked horn or better</p> <ul style="list-style-type: none"> <li>• Issue 6 buck deer tags for the period of August 15, 2017 through November 30, 2017.</li> <li>• No person shall take more than 1 buck deer annually in the X zones.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Renovate and re-level at least 80 acres of wild rice to improve water storage for waterfowl.</li> <li>➤ Thin western juniper from 3 acres at Moon Pasture.</li> <li>➤ Plant 250 willows in the Buck Pasture draw below the 3<sup>rd</sup> pond and 250 willows in the southwest corner of the marsh.</li> <li>➤ Plant 30 acres of millet, chufa, and dwarf corn on the eastside marsh to be left unharvested and ungrazed, 12 acres of wild rice to be left unharvested in Buck Pasture, 10 acres of barley to be left unharvested in Bass Pond, and 15 acres in the pivot corners to provide forage for wildlife.</li> <li>➤ Rotate 200 head of cattle through all of deeded ground. During summer, graze 75% of cattle on private lease ground, then bring cattle back to the ranch in fall to manage crop residue that restricts plant growth and development. Gather cattle and ship to winter pasture.</li> <li>➤ Build at least 5 brush piles (average size of 12 x 8 ft.) in the Moon Pasture to provide escape cover for wildlife.</li> </ul>
<p>WALTON HOMESTEAD FAMILY, LLC</p> <p>DEER ZONE X3A</p> <p>LASSEN</p> <p>5,980 ACRES</p>	<p><b>Authorized Harvest:</b> 5 either-sex deer and 1 buck pronghorn antelope</p> <ul style="list-style-type: none"> <li>• Issue 5 either-sex deer tags for the period of August 19, 2017 through October 29, 2017.</li> <li>• No person shall take more than 1 buck deer annually in the X zones.</li> <li>• Issue 1 buck pronghorn antelope tag for the period of August 1, 2017 through August 27, 2017.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Thin or remove juniper (200-500 acres/yr.) and seed with native grasses and wildflowers. Use residual slash to create wildlife brush piles.</li> <li>➤ Enlarge and deepen the containment basin for Hanna's Spring from the current 3-5 ft. to 5-10 ft. Install water trough downhill from the spring with piping to fill as necessary. Build livestock enclosure around spring and basin with wildlife-friendly fencing, and use solar pumping or gravity flow to give cattle and wildlife water access outside the fence.</li> <li>➤ Enlarge and deepen the containment basin for Horse Meadows Spring from the current 5-10 ft. to 12-15 ft. Install water trough downhill from the spring with piping or solar pumping to fill as necessary. Build an enclosure around the spring and basin with wildlife-friendly fencing.</li> <li>➤ Replace perimeter fencing with wildlife-friendly fencing (200-500 yards/yr.).</li> </ul>

**PLM AREA LICENSE**  
**NEW 5-YEAR MANAGEMENT PLANS, 2017-2022**  
**PROPOSED SEASONS, HARVESTS, AND HABITAT IMPROVEMENTS**

PLM Area	Proposed Season and Harvest	Habitat Improvement Program
<b>NORTH CENTRAL REGION</b>		
DESERET FARMS- BALLARD UNIT  DEER ZONE C-4  BUTTE  2,948 ACRES	<p><b>Authorized Harvest:</b> 2 buck deer forked horn or better and 10 antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 2 buck deer tags and 10 antlerless tags for the period of November 1, 2017 through December 31, 2017. 1 of the antlerless tags must be a Junior tag.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Enhance existing brush piles in upland areas at south end of lake and in island area toward north end of south portion of lake. Five brush piles on the island area, three at northwest portion of lake, and eight at the south end of the lake.</li> <li>➤ Mechanically control star thistle areas.</li> <li>➤ Fix blown out levees from 2017 storm events.</li> <li>➤ Build and install 10 owl boxes.</li> <li>➤ Monitor and replace any plantings that may have died and keep a record of plant survival.</li> <li>➤ Maintain current conditions in riparian areas.</li> <li>➤ Continue feral pig eradication.</li> <li>➤ Monitor wood duck and owl box occupancy.</li> <li>➤ If new orchards are installed construct fencing to reduce depredation.</li> </ul>
DESERET FARMS- WILSON UNIT  DEER ZONE C-4  BUTTE  7,989 ACRES	<p><b>Authorized Harvest:</b> 6 buck deer forked horn or better and 15 antlerless deer</p> <ul style="list-style-type: none"> <li>• Issue 15 antlerless tags and 6 buck deer tags for the period of November 1, 2017 through December 31, 2017. 1 of the antlerless tags must be a Junior tag.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Place fallen tree in pond for western pond turtle basking.</li> <li>➤ Enhance 3 brush piles on the west end of the Gianella Pond and 4 in the open area of the riparian area.</li> <li>➤ Begin removing salt cedar and Himalayan Blackberry in the Gianella Pond.</li> <li>➤ Build and install 8 wood duck boxes</li> <li>➤ Monitor plantings and replace any that may have died and keep a record of plant survival.</li> <li>➤ Maintain current conditions in riparian areas.</li> <li>➤ Continue feral pig eradication.</li> <li>➤ Monitor wood duck and owl box occupancy.</li> <li>➤ If new orchards are installed construct fencing to reduce depredation.</li> </ul>



**California Fish and Game Commission**  
**Stakeholder Engagement on American Bullfrogs and Non-native Turtles**  
*Revised October 5, 2018*

**Purpose**

California Fish and Game Commission (Commission) and California Department of Fish and Wildlife (CDFW) staff recommendation on a process and timeline for stakeholder engagement to identify potential regulatory and statutory changes, funding mechanisms, and strategies for existing wild populations of American bullfrogs and non-native turtles to reduce the impacts on California's native wildlife.

**Possible Participants**

- Environmental / Animal welfare Non-Governmental Organizations
  - Petitioners – Center for Biological Diversity and Save-the-Frogs!
  - Action for Animals
  - Humane Society of the United States
  - Rescue group representative – TBD
- Industry Representatives
  - Live Food Market – TBD
  - Aquaculture – TBD
  - Pet trade – TBD
- Agency Representatives
  - Commission - Executive Director, Wildlife Advisor, and Legal Counsel
  - CDFW - Wildlife Branch, Wildlife Investigations Lab, Fisheries Branch, and Law Enforcement Division
  - California Department of Food and Agriculture (CDFA) - TBD
  - California Department of Public Health (CDPH) - TBD
  - U.S. Fish and Wildlife Service (USFWS) – TBD; Region 1 and Region 8
  - Santa Cruz County and/or City - TBD
  - State of Washington and/or Oregon – Fish and Wildlife departments
- Legislature
  - California Asian and Pacific Islander Legislative Caucus staff
  - Natural Resources Committee staff
  - Joint Committee on Fisheries and Aquaculture staff

**Proposed Process**

- Agency Outreach - Commission staff hold several meetings (2-4) with agency staff to discuss implementation, management, enforcement, and regulatory consistency and compatibility.
  - One or two conference calls with implementing agencies CDFW, USFWS, Santa Cruz, Washington, and Oregon to discuss management strategies, implementation, and enforcement

- One or two meetings with state agencies CDFW, CDFA, CDPH to discuss regulatory consistency and compatibility and enforcement of regulations (Sacramento)
- Stakeholder Outreach - Commission staff hold series of small meetings (2-4) with key stakeholders to solicit input on options, including possible statutory and regulatory changes and management strategies.
  - Invitation only
  - Size – limit to 10-12 people each
  - Locations – Sacramento, Bay Area, Southern California
  - Structure
    - One or two meetings with environmental/animal welfare organizations, CDFW staff, and Commission staff (Sacramento)
    - One to two meetings with industry representatives, California Asian and Pacific Islander Legislative Caucus staff, CDFW staff, and FGC staff (Bay Area and Southern California)
- Legislative Outreach – Commission staff meetings (3) with California Asian and Pacific Islander Legislative Caucus, Natural Resources Committee, and Joint Committee on Fisheries and Aquaculture staff
- Commission and CDFW staff compile meeting outcomes and draft proposal
- Commission and CDFW staff co-host one-day public workshop to present draft proposal
  - Open to all interested parties
  - Location – Bay Area
  - Facilitated by FGC staff
  - Attendance by 1-2 Commissioners
- Commission and CDFW staff prepare and present final proposal to Commission
- Commission action on final proposal

## **Proposed Timeline**

- **Oct-Dec 2018**
  - Identify and confirm stakeholders for small group and agencies meetings
  - Commission and CDFW staff preparation for meetings (logistics, materials, format, etc.)
- **Jan-Apr 2019**
  - Hold stakeholder and agencies meetings
- **May-Oct 2019**
  - Outreach meetings with legislative caucus/committees
  - CDFW and FGC staff draft proposal
  - CDFW and FGC staff preparation for workshop
- **Nov 2019**
  - Public workshop

- ***Dec-Feb 2019***
  - CDFW and FGC finalize proposal
- ***May-June 2019***
  - Staff presentation and possible action on proposal by Commission

**CALIFORNIA FISH AND GAME COMMISSION**  
**LIST OF NON-REGULATORY REQUESTS FROM PREVIOUS MEETING SCHEDULED FOR ACTION ON OCTOBER 17, 2018**  
**Revised 10-12-18**

**FGC** - California Fish and Game Commission   **DFW** - California Department of Fish and Wildlife   **WRC** - Wildlife Resources Committee   **MRC** - Marine Resources Committee

<b>Date Received</b>	<b>Name of Petitioner</b>	<b>Request category (Marine or Wildlife)</b>	<b>Subject of Request</b>	<b>Short Description</b>	<b>FGC Decision</b>	<b>Staff / DFW Recommendations</b>
7/9/2018	Julie Solo	Wildlife	Beavers	Requests (1) Non-lethal management strategies be developed, and (2) change regulations to restrict trapping in "beaver-deficient" areas.	<b>Receipt: 8/22-23/2018</b> <b>Action scheduled: 10/17/2018</b>	<b>10/17/2018</b> <b>FGC:</b> (1) No action recommended at this time. (2) Requestor has been notified to complete and submit petition for regulation change (FGC 1).  <b>DFW:</b> (1) Non lethal management strategies already exist; no action recommended.
7/29/2018 8/23/2018	Gary Brennan Bill Gaines (on behalf of Gary Brennan)	Wildlife	Cañada de San Vicente Land Management Plan	Request for FGC to vote on the Cañada de San Vicente Land Management Plan as soon as possible.	<b>Receipt: 8/22-23/2018</b> <b>Action scheduled: 10/17/2018</b>	<b>10/17/2018</b> <b>DFW/FGC:</b> FGC does not adopt land management plans; it designates a property as a wildlife area or ecological reserve, which may include adopt property-specific regulations that go beyond what is already in Title 14. DFW will address Cañada de San Vicente as part of a larger DFW-lands rulemaking proposal in 2019.
8/22/2018	Noah Oppenheim Pacific Coast Federation of Fishermen's Associations	Wildlife	Bay-Delta Water Quality Control Plan update	Requests that, in order to protect salmon, FGC ensure DFW promulgates strong and protective in-stream flow requirements as part of its settlement agreement discussions with water contractors.	<b>Receipt: 8/22-23/2018</b> <b>8/22/28: Scheduled for informational overview from DFW at the October 2018 FGC meeting</b>	<b>10/17/2018</b> No further action necessary.

Bring Beavers Back!

Dear Fish and Game Commission,

Beavers are a keystone species, playing a critical role in biodiversity and providing direct benefits to surrounding ecosystems as well as fish, wildlife and people. While beavers are native to California, because of a history of over-exploitation, they are missing from many important areas of the state. Bringing back California's beavers is a cost-effective way to help improve our watersheds and our fisheries.

It's time to rethink California's regulations concerning beavers. Please act to develop non-lethal beaver management and impose stricter trapping rules for areas that are identified as beaver-deficient to help promote co-existence with beavers. Beavers are worth a dam!

Sincerely,

Julie Solo

NAME

EMAIL

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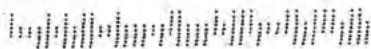
Celebrating 40 Years of  
Forest Protection  
[www.WildCalifornia.org](http://www.WildCalifornia.org)

To:

California Fish and Game  
Commission

P.O. Box 944209

Sacramento, CA 94244-2090







**From:** Gary Brennan

**Sent:** Sunday, July 29, 2018 4:52 PM

**To:** California Fish and Game Commission

**Subject:** Petition to Schedule and Vote on the Cañada de San Vicente Land Management Plan

Dear Ms. Termini,

As the President of the San Diego County Wildlife Federation (SDCWF), a non-profit amalgam of local conservation-oriented clubs and organizations, as well as the local chapters of similar national organizations representing 18,000 sportsmen and women. I am writing the Commission today to petition a vote to approve the Cañada de San Vicente Land Management Plan which was completed in 2016. As one of the SDCWF's mission elements is to maintain a federation of organizations dedicated to the acquisition, maintenance, development, restoration and conservation of wildlife habitat and wildlife resources for public use.

The Cañada de San Vicente Land Management Plan has been waiting approval for since 2016 and still has not been brought up to the commission's consideration. We understand the Cañada de San Vicente Management Plan is not slated for discussion until sometime in 2019. The SDCWF has discussed the Management Plan issue with DFW Region Five management on numerous occasions and the Region Five Office is ready to open the property for the enjoyment of all San Diegans as well as visitors to the area. The Department would like to schedule hunts for veterans and the youth of southern California as soon as this fall hunting season and open the space for general outdoor recreation activities as well.

The SDCWF does not believe in the non-use of our resources so anything the commission can do to expedite the ruling on the management plan would be beneficial to our constituents and member organizations.

Please accept this petition to vote on the Cañada de San Vicente Land Management Plan as soon as possible.

Respectfully Submitted,

*Gary F. Brennan*

President, San Diego County Wildlife Federation

P.O. Box 3886

Ramona, CA 92065

“Look deep into nature, and then you will understand everything better.” — Albert Einstein

CALIFORNIA FISH AND GAME COMMISSION  
STATEMENT OF PROPOSED EMERGENCY REGULATORY ACTION FOR  
READOPTON OF EMERGENCY REGULATIONS

Readoption of Section 29.11  
Title 14, California Code of Regulations  
Re: Purple Sea Urchin

Date of Statement: September 18, 2018

**I. Emergency Regulation in Effect to Date**

The California Fish and Game Commission (Commission) approved an emergency rulemaking, Section 29.11, which became effective on May 10, 2018. The emergency addresses concerns over the impact of purple sea urchin overpopulation along the northern California coast. The emergency rulemaking increased the daily recreational bag limit for purple sea urchins taken through skin or scuba diving off the coast of Mendocino County and Sonoma County to 20 gallons. It also exempts the possession of purple sea urchin from any recreational possession limit.

The rule was originally adopted to catalyze a growing recreational interest in harvesting an overpopulated purple sea urchin and to help restore northern California kelp forests. Adopting Section 29.11 as an emergency rule was necessary due to the speed at which the purple sea urchin were negatively impacting the northern California kelp forests, the primary habitat of the red abalone.

The staff of the California Department of Fish and Wildlife (Department) has also been working with other stakeholders in several restoration efforts. Studies have so far been conducted in Ocean Cove, Sonoma County, and Albion Cove, Mendocino County. On both occasions, roughly 100 recreational divers participated and removed approximately 60,000 purple sea urchins from barren habitats. More studies have been planned, and Department staff will continue to track the effect of these removal events.

**II. Request for Approval of Readoption of Emergency Regulations**

The current emergency rule, Section 29.11, will expire on November 7, 2018, unless it is readopted for an additional 90 days through February 5, 2019. Department and Commission staff are currently working towards a standard rulemaking to adopt provisions similar in scope to the Emergency Section 29.11.

One of the primary goals of the restoration effort is to restore healthy stands of Bull kelp (*Nereocystis luetkeana*) and to study the species' response to urchin removal. Bull kelp is the dominant kelp species in northern California, and is a relatively slow-growing perennial species. Any restoration attempt would yield

observable results only after it has been conducted for over a year, within that time the Department will have the non-emergency Section 29.11 in place.

### **III. Statement of Facts Constituting the Need for Readoption of the Emergency Regulatory Action**

The recreational red abalone (*Haliotis rufescens*) fishery is one of California's most important fisheries, generating millions of dollars in tourism revenue for the northern California coast. Severe environmental conditions over the past several years have triggered a cascade of ecological changes that greatly impacted abalone populations and led to closure of the fishery.

The combination of unprecedented environmental and biological stressors has caused the bull kelp forest, the primary source of food for abalone, to shrink to only 10% of its historical coverage along the coasts of Sonoma and Mendocino counties. The loss of the kelp forest has led to widespread starvation of abalone. In 2016 and 2017, more than 25 percent of the abalones assessed (greater than 6,000 abalone per year) in the nine creel surveys at key fished sites in Sonoma and Mendocino counties had shrunken foot muscles due to starvation. Starved abalones have an increased chance of mortality and severely reduced reproduction further limiting their recovery.

Additionally, the kelp forest recovery is severely hindered due to the increased abundance of purple sea urchin (*Strongylocentrotus purpuratus*). Unlike abalone, sea urchins are generally resilient to food shortage and can survive longer without food, and grazing pressure from surviving sea urchins may prevent kelp recovery even as ocean conditions rebound. The urchin population boom is further exacerbated by the absence of important predatory sea stars (*Pisaster spp.*), which were severely impacted by the onset of the sea star wasting disease in 2013. With the sea star population still recovering from the epidemic, there will be little top-down control on the urchin population in northern coastal waters in the immediate future.

The most recent Department dive survey indicates that the abalone population in northern California remains in a persistently poor state. The poor state of the kelp forest ecosystem is further corroborated by anecdotal observations from recreational divers and commercial divers that have recently visited the area. Red abalone density at the Fort Ross survey site has dropped from 0.2 individuals/m<sup>2</sup> in 2017 to 0.08 individual/m<sup>2</sup> in 2018. Density at the Van Damme survey site only rose marginally from 0.14 individuals/m<sup>2</sup> in 2017 to 0.16 individual/m<sup>2</sup> in 2018, which is still less than 20% of the density of that site at the turn of the century.

#### **Habitat loss critically impacting red abalone has been documented along the north coast by Department staff:**

1. A dramatic decline in sea stars, important sea urchin predators, due to sea star wasting disease 2013-2015.

2. A dramatic decline (greater than 93 percent) of the kelp canopy in Sonoma and Mendocino counties in 2014.
3. A dramatic increase (greater than 60 times) in the density of purple sea urchins since 2014, increasing competition with abalone for food as well as suppressing recovery of kelp beds.
4. Persistent warm seawater conditions in Sonoma and Mendocino counties, particularly in 2014 and 2015.
5. Continued decline in overall average abalone densities in spite of significant take reductions implemented in 2014, ultimate closure of the fishery in 2018.

**Health and reproductive loss critically impacting red abalone has been documented along the north coast by Department staff:**

1. Visual abalone body health scores for abalone taken in the fishery during the spring of 2016 and 2017 show that more than 25 percent of abalone were shrunken in body mass at sites in northern California.
2. Reproductive condition index declined by greater than 50 percent at Van Damme State Park and Fort Ross in 2017, with increasing impact to reproduction evident in shrunken abalone (60 abalone per site).
3. Department staff and the public have observed weak abalone washed up on shore and easy to remove from the rocks as well as many new shells of all size classes, indicating increased natural mortality.
4. Low numbers of larval abalone observed in plankton surveys in Sonoma and Mendocino counties in 2015.
5. Small numbers of newly settled abalone observed in coralline-covered rock samples from Sonoma and Mendocino counties in 2015.
6. Few juvenile (less than 21 millimeters) red abalone observed in artificial reefs in Van Damme State Park since 2015.
7. Preliminary result from 2018 abalone survey shows that abalone densities continue to decline.

## **Prior Commission Actions**

In December 2017, the Commission closed the red abalone fishery for the 2018 season. Since then, the poor condition of the kelp forests has persisted. In August 2018, Commission and stakeholders agreed to potentially extend the closure by another two years. Recovery of the abalone fishery will not be possible without the prompt recovery of the bull kelp forests and the return of sufficient food to support abalone survival and reproduction.

Also in December 2017, the Commission considered alternatives to increasing or removing the take restrictions on the recreational purple sea urchin harvest, with the goal of supporting possible restoration of naturally occurring kelp along the environmentally impacted areas. In April 2018, the Commission adopted the emergency rule to significantly increase take of purple sea urchin and the emergency regulation went into effect on May 10, 2018.

## **Existence of an Emergency and Need for Immediate Action**

The Commission considered the following factors in determining whether an emergency exists: The magnitude of potential harm; the existence of a crisis situation; the immediacy of the need; and whether the anticipation of harm has a basis firmer than simple speculation. All available information points to a highly volatile and adverse condition for northern California kelp forests and the resident abalone populations, and extraordinary measures must continue to help restore important but vulnerable habitat.

## **Proposed Action by the Commission**

The Commission proposes the readoption of Section 29.11 that is the same as previously adopted.

## **IV. Impact of Regulatory Action**

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following determinations relative to the required statutory categories have been made:

- (a) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State: None.
- (b) Nondiscretionary Costs/Savings to Local Agencies: None.
- (c) Programs Mandated on Local Agencies or School Districts: None.
- (d) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code: None.

(e) Effect on Housing Costs: None.

## **V. Readoption Criteria**

### **1) Same as or Substantially Equivalent**

Pursuant to Government Code Section 11346.1(h), a readoption may be approved only if the text is “the same as or substantially equivalent to an emergency regulation previously adopted by that agency.” The language proposed for this rulemaking is the same as the language of the original emergency regulation.

### **2) Substantial Progress**

Government Code Section 11346.1(h) specifies “Readoption shall be permitted only if the agency has made substantial progress and proceeded with diligence to comply with subdivision (e) [of Sections 11346.2 through 11347.3, inclusive].” A rulemaking in compliance with these sections is currently ongoing and scheduled for public hearing and adoption in February, 2019

## **VI. Authority and Reference**

The Commission proposes this emergency action pursuant to the authority vested by sections 200, 205, and 399 of the Fish and Game Code and to implement, interpret, or make more specific sections 200, 205, and 399 of said code.

## **IV. Section 399 Finding**

Pursuant to Section 399 of the Fish and Game Code, the Commission finds that the adoption of this regulation is necessary for the immediate conservation, preservation, or protection of birds, mammals, reptiles, or fish (abalone).



## Informative Digest

The California Fish and Game Commission (Commission) adopted Section 29.11, Purple Sea Urchin, as an emergency rulemaking raising the recreational limit of purple sea urchins taken off the coast of Mendocino and Sonoma Counties, effective on May 10, 2018.

The emergency rule is due to expire on November 7, 2018, if a readoption is not filed. Readoption will extend the regulation for 90 days through February 5, 2019. This is necessary to ensure that the Department can continue to evaluate kelp forest ecosystem restoration efforts. The Department and Commission are currently working towards a standard rulemaking to adopt provisions similar in scope to the Emergency Section 29.11. A public hearing will be scheduled for February, 2019.

### Proposed Regulatory Action:

The regulation temporarily raises the daily bag limit for purple sea urchins taken while skin-diving or SCUBA diving in Sonoma and Mendocino counties to twenty (20) gallons. The proposal would also allow unlimited possession of recreationally taken purple sea urchin.

### Benefits of the Regulation to the State's Environment:

The Commission anticipates benefits to the State's environment by the sustainable management of California's ocean resources. The increased take for the recreational purple sea urchin harvest, with the goal of supporting restoration of naturally occurring kelp along the environmentally impacted areas, is critical to the recovery of the red abalone and the rest of the northern California kelp forest ecosystem.

### Consistency and Compatibility with Existing State Regulations:

The Legislature has delegated authority to the Commission to promulgate sport fishing regulations (Fish and Game Code, sections 200 and 205) as well as authority to promulgate corresponding emergency regulations as necessary (Fish and Game Code, Section 399). No other state agency has the authority to promulgate such regulations. The Commission has conducted a search of Title 14, California Code of Regulations (CCR) and determined that the proposed regulation is neither inconsistent nor incompatible with existing State regulations, and that the proposed regulation is consistent with other sport fishing regulations and marine protected area regulations in Title 14, CCR.

## **Emergency Regulatory Language**

Section 29.11, Title 14, CCR, is added as follows:

### **§ 29.11. Purple Sea Urchin**

(a) The daily bag limit for purple sea urchin taken while skin or SCUBA diving in state waters off Mendocino and Sonoma Counties is twenty (20) gallons.

(b) There is no possession limit for purple sea urchin.

Authority cited: Sections 200, 205 and 399, Fish and Game Code.

Reference: Sections 200, 205 and 399, Fish and Game Code

## **California Fish and Game Commission**

### **Potential Agenda Items for December 2018 Commission Meeting**

The next Commission meeting is scheduled for December 12-13, 2018 in Oceanside. This document identifies potential agenda items for the meeting, including items to be received from Commission staff and the California Department of Fish and Wildlife (DFW).

Note that for 2019 Commission meetings, wildlife and inland fisheries items will be heard on the first day and marine items will be heard on the second day.

#### **Wednesday, December 12: Marine-related and administrative items**

1. Public comment
2. Executive director's report (staff report, legislative update)
3. Tribal Committee
4. Marine Resources Committee
5. Adopt: Groundfish
6. Adopt: Recreational take of red abalone
7. Discuss and adopt: Commercial logbooks
8. Discuss recreational purple sea urchin
9. Discuss California sheephead filleting at sea
10. Notice: Recreational and commercial Pacific herring [fishery management plan (FMP) implementation]
11. Receive and discuss draft Pacific herring FMP and California Environmental Quality Act documentation
12. Discuss next steps in red abalone FMP development and consideration of peer review results
13. Approve box crab experimental gear permit applications
14. Receive annual report on DFW Statewide Marine Protected Areas Program management activities
15. Annual recreational ocean salmon and Pacific halibut regulations – Receive and discuss update on Pacific Fishery Management Council process and timeline, and automatic conformance to federal regulations (pursuant to Section 1.95, Title 14, CCR)
16. Marine items of interest from previous meetings
17. Action on marine petitions for regulation change
18. Action on non-regulatory marine requests from previous meetings
19. Receive DFW informational items (marine)
20. Strategic planning

#### **Thursday, December 13: Wildlife- and inland fisheries-related and administrative items**

21. Public comment
22. Wildlife Resources Committee
23. Adopt: Sport fishing (annual)
24. Notice: Mammal hunting (annual)

25. Notice: Archery equipment and crossbow
26. Notice: Waterfowl (annual)
27. Notice: Klamath-Trinity salmon sport fishing (annual)
28. Notice: Central Valley salmon sport fishing (annual)
29. Notice: Deer/elk tag validation
30. Adopt findings for Humboldt marten listing under the California Endangered Species Act (CESA)
31. Receive CESA petition to list northern California summer steelhead
32. Receive 90-day evaluation for upper Klamath-Trinity rivers spring Chinook salmon
33. Receive, discuss and adopt wild trout waters designations per DFW recommendation
34. Wildlife and inland fisheries items of interest from previous meetings
35. Action on wildlife and inland fisheries petitions for regulation change
36. Action on non-regulatory wildlife and inland fisheries requests from previous meetings
37. Receive DFW informational items (wildlife and inland fisheries)
38. Administrative items (next meeting agenda items, rulemaking timetable, new business)

# California Fish and Game Commission – Perpetual Timetable for Anticipated Regulatory Actions

(dates shown reflect the date intended for the subject regulatory action)

Updated: 10/05/18

ITEMS PROPOSED FOR CHANGE ARE SHOWN IN BLUE FONT

Updated: 10/05/18						ITEMS PROPOSED FOR CHANGE ARE SHOWN IN BLUE FONT										2018										2019										
For FGC Staff Use				REGULATORY CHANGE CATEGORY		ACTION DATE, TYPE AND LOCATION		OCT 16	OCT 17	NOV 14	DEC 12   13		JAN 10	FEB 5	FEB 6   7		MAR 19	APR 17   18		MAY 16	JUN 11	JUN 12   13		JUL 11	AUG 7   8		SEP 5									
QUARTERLY EFFECTIVE	DFWRU ANALYST	FGC ANALYST	LEAD					TC FRESNO	FGC FRESNO	MRC SACRAMENTO	FGC OCEANSIDE	WRC RIVERSIDE	TC REDDING	FGC REDDING	MRC MONTEREY/MARINA	FGC FRESNO/ BAKERSFIELD	WRC SACRAMENTO	TC SACRAMENTO AREA	FGC SACRAMENTO AREA	MRC SAN CLEMENTE	FGC MAMMOTH/ BISHOP	WRC SANTA ROSA														
																							File Notice w/OAL by Notice Published													
																							Title 14 Section(s)													
* OA SF FB	Commercial Use <u>and Possession</u> of Rattlesnakes - <u>Resubmittal</u>					42, 43, 651, 703																														
* / SF	FGC Tribal Take in Marine Protected Areas					632																														
* / SF	FGC Rockport Rocks Special Closure					632(b)(17)																														
MR JS	WLB Sage Grouse Preferential Points and Draw					716																														
* OA JS	MR Incidental Take Allowances for Crabs, other than Genus <i>Cancer</i> , in Trap Fisheries					125.1(c)(3), 126, 126.1																														
* MR ST	HCB Coast Yellow Leptosiphon and Lassics Lupine					670.2																														
OA ST	MR Groundfish					27.30, 27.35, 27.40, 27.45, 27.50, 28.27, 28.55, 52.10, 150.16																														
MS ST	MR Recreational Take of Red Abalone					29.15																														
* MR ST	MR Commercial Logbooks					107, 174 and 176																														
OA JS	FB Sport Fishing (Annual)					1.53, 1.74, 5.00																														
MR DT	MR Recreational Purple Sea Urchin (Emergency)					29.11																														
MR DT	MR <u>Recreational Purple Sea Urchin (Emergency) (1st 90-day extension)</u>					<u>29.11</u>																														
MR DT	MR <u>Recreational Purple Sea Urchin (Regular Rulemaking)</u>					<u>29.06</u>																														
* OA SF/CC	MR <u>Sheephead Fillet</u>					<u>27.65(b)</u>																														
* MR ST	MR Recreational and Commercial Pacific Herring (Fishery Management Plan implementation)					27.60, 28.60, 28.62, 163, 163.1, 163.5, 164																														
MR JS	WLB Mammal Hunting (Annual), if needed					362, 364, 364.1																														
MR JS	LED Archery Equipment and Crossbow					354(f)																														
MR JS	WLB Waterfowl (Annual)					502, 509																														
OA SF/CC	FB Klamath-Trinity Salmon Sport Fishing (Annual)					7.50(b)(91.1)																														
OA SF/CC	FB Central Valley Salmon Sport Fishing (Annual)					7.50(b)(5), (68), (156.5)																														
MR JS	LED Deer/Elk Tag Validation					708.6, 708.11																														
MR JS/CC	WLB Upland (Resident) Game Bird (Annual)					300																														
RULEMAKING SCHEDULE TO BE DETERMINED																																				
* /	MR Kelp and Algae Harvest Management					165, 165.5, 704																														
* /	Possess Game / Process Into Food					TBD																														
* /	OGC American Zoological Association / Zoo and Aquarium Association					671.1																														
	Night Hunting in Gray Wolf Range					474																														
	Shellfish Aquaculture Best Management Practices					TBD																														
* / ST	Fisher					670.5																														
* / ST	Humboldt Marten					670.5																														
* / ST	Northern Spotted Owl					670.5																														
* / ST	Tricolored Blackbird					670.5																														
* /	Ban of Neonicotinoid Pesticides on Department Lands					TBD																														
* /	MR Commercial Pink Shrimp Trawl					120, 120.1, 120.2																														
* /	MR <u>Sheephead</u>					<u>TBD</u>																														
* /	MR Ridgeback Prawn Incidental Take Allowance					120(e)																														

## RULEMAKING SCHEDULE TO BE DETERMINED

*			MR	Kelp and Algae Harvest Management	165, 165.5, 704									V									
*				Possess Game / Process Into Food	TBD																		
*			OGC	American Zoological Association / Zoo and Aquarium Association	671.1																		
				Night Hunting in Gray Wolf Range	474																		
				Shellfish Aquaculture Best Management Practices	TBD			R															
*		ST		Fisher	670.5																		
*		ST		Humboldt Marten	670.5																		
*		ST		Northern Spotted Owl	670.5																		
*		ST		Tricolored Blackbird	670.5																		
*				Ban of Neonicotinoid Pesticides on Department Lands	TBD																		
*			MR	Commercial Pink Shrimp Trawl	120, 120.1, 120.2																		
●			MR	Sheephead	TBD																		
*			MR	Ridgeback Prawn Incidental Take Allowance	120(e)																		

EM = Emergency, EE = Emergency Expires, E = Anticipated Effective Date (RED "X" = expedited OAL review), N = Notice Hearing, D = Discussion Hearing, A = Adoption Hearing, V = Vetting, R = Committee Recommendation, WRC = Wildlife Resources Committee, MRC = Marine Resources Committee, TC = Tribal Committee

## Memorandum

2018 SEP 27 PM 11:30

Date: September 25, 2018

To: Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Request for Changes to the Fish and Game Commission's Timetable for Anticipated Regulatory Actions**

The Department of Fish and Wildlife (Department) requests the following schedule changes to the Fish and Game Commission's (Commission's) 2018 regulatory timetable:

- Move up the TDB rulemaking to amend section 27.65(b)(12) to add California Sheephead to the list of "Fish That May be Filleted". The sport fishing industry, including the Sportfishing Association of California (SAC) have been advocating for the implementation of a fillet length regulation that permits the fish to be filleted at sea, which is preferred by anglers. The Department has completed a study and is ready to proceed with the regulations. The Department would like to advance this long-awaited rulemaking for the next season. As it is a part of the Department's role and mission to consider angler enjoyment of sportfish resources, the proposed regulation would meet angler preferences for transport of cleaned fish.
  - The requested meeting schedule is notice at the October 2018 meeting, discussion at the December 2018 meeting, and adoption at the February 2019 meeting.
- Add a rulemaking to adopt section 29.11 as a standard rulemaking for establishing a recreational purple sea urchin take limit. Conditions in the northern California kelp forests have not improved, and Department scientists must continue to study the effect of urchin removal.
  - The requested meeting schedule is notice at the October 2018 meeting, discussion at the December 2018 meeting, and adoption at the February 2019 meeting.

If you have any questions or need additional information, please contact Regulations Unit Manager, Michelle Selmon at (916) 653-4674 or by email at [Michelle.Selmon@wildlife.ca.gov](mailto:Michelle.Selmon@wildlife.ca.gov).



Melissa Miller-Henson  
Acting Executive Director  
Fish and Game Commission  
September 25, 2018  
Page 2

cc: Stafford Lehr, Deputy Director  
Wildlife and Fisheries Division  
[Stafford.Lehr@wildlife.ca.gov](mailto:Stafford.Lehr@wildlife.ca.gov)

David Bess, Chief  
Law Enforcement Division  
[David.Bess@wildlife.ca.gov](mailto:David.Bess@wildlife.ca.gov)

Craig Shuman, D. Env., Manager  
Marine Region  
[Craig.Shuman@wildlife.ca.gov](mailto:Craig.Shuman@wildlife.ca.gov)

Kevin Shaffer, Chief  
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Wildlife and Fisheries Division  
[Kevin.Shaffer@wildlife.ca.gov](mailto:Kevin.Shaffer@wildlife.ca.gov)

Kari Lewis, Chief  
Wildlife Branch  
Wildlife and Fisheries Division  
[Kari.Lewis@wildlife.ca.gov](mailto:Kari.Lewis@wildlife.ca.gov)

Joshua Morgan, Chief  
License and Revenue Branch  
[Joshua.Morgan@wildlife.ca.gov](mailto:Joshua.Morgan@wildlife.ca.gov)

Michelle Selmon, Program Manager  
Regulations Unit  
Wildlife and Fisheries Division  
[Michelle.Selmon@wildlife.ca.gov](mailto:Michelle.Selmon@wildlife.ca.gov)



California Natural Resources Agency  
**DEPARTMENT OF FISH AND WILDLIFE**  
License and Revenue Branch  
1740 N. Market Blvd  
Sacramento, CA 95834  
www.wildlife.ca.gov  
(916) 928-8322  
Fax (916) 419-7587

EDMUND G. BROWN Jr., Governor  
CHARLTON H. BONHAM, Director



**Certified Mail**

July 19, 2018

Mr. Tyler W. Reese  
[REDACTED] St.  
Ramona, CA. 92065

**SUBJECT: NOTICE OF SUSPENSION OF TRAPPING LICENSE**

Pursuant to Section 467, Title 14, of the California Code of Regulations (Section 467), recreational trappers are required to report their annual take of furs for the preceding trapping season to the Department by July 1, even if the take was zero furs, or their Trapping License will be suspended.

Department of Fish and Wildlife (Department) license records show you did not submit a trapping report by July 1, 2018, for the 2017-2018 trapping year. Therefore, pursuant to Section 467, the Department is hereby suspending your Trapping License.

If you wish to request an appeal before the California Fish and Game Commission (Commission) to reinstate your license, you may submit your request to the Commission by mail at P.O. Box 944209, Sacramento, California 94244-2090, fax at (916) 653-5040, or email at [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).

If you believe this notice was sent in error, please contact Ms. Sally Howard of my staff, at the letterhead address or by telephone at (916) 928-5852 or email [Sally.Howard@wildlife.ca.gov](mailto:Sally.Howard@wildlife.ca.gov).

Sincerely, *Sammy Wong*  
*Sammy Wong, Assistant Branch Chief*  
on behalf of,  
Joshua Morgan, Chief  
License and Revenue Branch

cc: Mr. Mike Yaun  
Fish and Game Commission  
Sacramento, California

Mr. William Caputo  
Department of Fish and Wildlife  
Sacramento, California

Ms. Sally Howard  
Department of Fish and Wildlife  
Sacramento, California

July 20, 2018

Tyler w. Reese

[REDACTED] st

Ramona ca 92065

To: ca fish and game commission

Hello my name is tyler reese and I am/was a licensed trapper. My license has been suspended as of July 19 2018 due to non report of annual take(section 457, title 14). I had zero to report for the license coverage period as I have not done any trapping during this period. I have repeatedly shown due diligence on my licensing and reporting on all license requirements for years as a licensed trapper, hunter, fisherman. This year was a honest mistake. I did not receive my renewal packet from the dept. as mail theft is rampant in my rural town and due to being gainfully employed as a construction safety professional for a large company, raising a family, coaching 3 sports, and just being generally very busy with life, I did not think about reporting until I was looking at a calander on July 5<sup>th</sup> and remembered that I had to do so by the first. I immediately called sally howard as to rectify the problem. But she couldn't help. I request that you reinstate my license and allow me to pay my renewal fees as to keep my license active in case I would like to restart my neusance wildlife services in the future. I am sorry for the inconvenience this has caused both myself and the dept. and the commission, but I whole hartedly forgot until it was to late. Hopefully the commission has a understanding of real life struggles and crazy agendas, and can fulfill my request asap.

Thank you,

Tyler w reese

[REDACTED]

[REDACTED]@ [REDACTED]



State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
Office of the General Counsel  
P.O. Box 944209  
Sacramento, CA 94244-2090  
[www.wildlife.ca.gov](http://www.wildlife.ca.gov)

EDMUND G. BROWN JR., Governor  
CHARLTON H. BONHAM, Director



September 18, 2018

California Fish and Game Commission  
P.O. Box 944209  
Sacramento, CA 94244-2090

Re: Department's Non-Participation *In the Matter of Tyler Reese*

Dear Commissioners:

The purpose of this letter is to inform you that the Department of Fish and Wildlife ("Department") will not be participating in a hearing regarding Tyler Reese's request to reinstate his trapping license ("Reinstatement Request"), and does not object to this Reinstatement Request.

Mr. Reese's trapping license was suspended pursuant to California Code of Regulations, title 14, section 467, for failing to submit a trapping report by July 1, 2018<sup>1</sup>. A licensee whose license is suspended may ask the Fish and Game Commission to reinstate it. After the deadline, Mr. Reese submitted a trapping report for the past year.

Please note that if Mr. Reese fails to timely submit a trapping report in a future year, the Department may object to a future Reinstatement Request made by him.

If you have any questions please contact me at the address above or by telephone number (916) 651-7646, or e-mail at [David.Kiene@wildlife.ca.gov](mailto:David.Kiene@wildlife.ca.gov).

Sincerely,

DAVID KIENE  
Senior Staff Counsel

Cc: Tyler Reese

---

<sup>1</sup> C.C.R., tit. 14, § 467 states, "All holders of trapping licenses must submit to the department a sworn statement or report by July 1 of his/her annual take of fur for the preceding trapping season. Statement or report shall show the number of each kind of furbearing mammals and nongame mammals taken, number sold, county in which furs were taken and the names and addresses of the persons to whom furs were shipped or sold. If the annual report is not received by July 1 following the most recent trapping year, or if it is not completely filled out, the trapper's license will be suspended. The commission shall be notified of any suspension and, subsequently, may revoke or reinstate applicant's license renewal application after written notice is given to the applicant and after he has been afforded an opportunity to be heard."



California Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
License and Revenue Branch  
1740 N. Market Blvd  
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(916) 928-8322  
Fax (916) 419-7587

EDMUND G. BROWN Jr., Governor  
CHARLTON H. BONHAM, Director



**Certified Mail**

July 19, 2018

Mr. Christopher P. Giannini

San Gregorio, CA. 94074

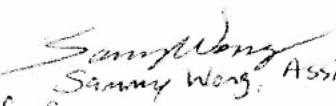
**SUBJECT: NOTICE OF SUSPENSION OF TRAPPING LICENSE**

Pursuant to Section 467, Title 14, of the California Code of Regulations (Section 467), recreational trappers are required to report their annual take of furs for the preceding trapping season to the Department by July 1, even if the take was zero furs, or their Trapping License will be suspended.

Department of Fish and Wildlife (Department) license records show you did not submit a trapping report by July 1, 2018, for the 2017-2018 trapping year. Therefore, pursuant to Section 467, the Department is hereby suspending your Trapping License.

If you wish to request an appeal before the California Fish and Game Commission (Commission) to reinstate your license, you may submit your request to the Commission by mail at P.O. Box 944209, Sacramento, California 94244-2090, fax at (916) 653-5040, or email at [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov).

If you believe this notice was sent in error, please contact Ms. Sally Howard of my staff, at the letterhead address or by telephone at (916) 928-5852 or email [Sally.Howard@wildlife.ca.gov](mailto:Sally.Howard@wildlife.ca.gov).

Sincerely,   
on behalf of, *Sammy Wong, Assistant Branch Chief*  
Joshua Morgan, Chief  
License and Revenue Branch

cc: Mr. Mike Yaun  
Fish and Game Commission  
Sacramento, California

Mr. William Caputo  
Department of Fish and Wildlife  
Sacramento, California

Ms. Sally Howard  
Department of Fish and Wildlife  
Sacramento, California

**Yaun, Michael@FGC**

---

**From:** [REDACTED]  
**Sent:** Tuesday, August 7, 2018 1:08 PM  
**To:** FGC  
**Cc:** Howard, Sally@Wildlife  
**Subject:** Reinstate trappers lic. #TP-10168

California Fish and Game Commission

I'm making a request for you to reinstate my trappers lic. I filed my report late this year by mistake. I didn't realize that I didn't turn it in and by the time I did it was late. I really try to follow all the rules and I know this is an important rule. I did not trap any animals last year so that is probably why it slipped my mind. I have put an alert on my phone now so this will not happen again. I apologize for not getting this in.

Thank you for reviewing my case and I hope to hear from you soon with good news.

Thank you

Chris Giannini





State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
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[www.wildlife.ca.gov](http://www.wildlife.ca.gov)

EDMUND G. BROWN JR., Governor  
CHARLTON H. BONHAM, Director



September 18, 2018

California Fish and Game Commission  
P.O. Box 944209  
Sacramento, CA 94244-2090

Re: Department's Non-Participation *In the Matter of Christopher Giannini*

Dear Commissioners:

The purpose of this letter is to inform you that the Department of Fish and Wildlife ("Department") will not be participating in a hearing regarding Christopher Giannini's request to reinstate his trapping license ("Reinstatement Request"), and does not object to this Reinstatement Request.

Mr. Giannini's trapping license was suspended pursuant to California Code of Regulations, title 14, section 467, for failing to submit a trapping report by July 1, 2018<sup>1</sup>. A licensee whose license is suspended may ask the Fish and Game Commission to reinstate it. After the deadline, Mr. Giannini submitted a trapping report for the past year.

Please note that if Mr. Giannini fails to timely submit a trapping report in a future year, the Department may object to a future Reinstatement Request made by him.

If you have any questions please contact me at the address above or by telephone number (916) 651-7646, or e-mail at [David.Kiene@wildlife.ca.gov](mailto:David.Kiene@wildlife.ca.gov).

Sincerely,

DAVID KIENE  
Senior Staff Counsel

Cc: Christopher Giannini

---

<sup>1</sup> C.C.R., tit. 14, § 467 states, "All holders of trapping licenses must submit to the department a sworn statement or report by July 1 of his/her annual take of fur for the preceding trapping season. Statement or report shall show the number of each kind of furbearing mammals and nongame mammals taken, number sold, county in which furs were taken and the names and addresses of the persons to whom furs were shipped or sold. If the annual report is not received by July 1 following the most recent trapping year, or if it is not completely filled out, the trapper's license will be suspended. The commission shall be notified of any suspension and, subsequently, may revoke or reinstate applicant's license renewal application after written notice is given to the applicant and after he has been afforded an opportunity to be heard."

BEFORE THE  
FISH AND GAME COMMISSION  
STATE OF CALIFORNIA

In the Matter of the Statement of Issues Against:

GREGORY JANIS,

Respondent.

Case No. 15ALJ06-FGC

OAH No. 2018070557

**PROPOSED DECISION**

Administrative Law Judge Coren D. Wong, Office of Administrative Hearings, State of California, heard this matter on August 30, 2018, in Sacramento, California.

David Kiene, Staff Counsel, represented complainant Joshua Morgan, Chief of the License and Revenue Branch, Department of Fish and Wildlife (Department), State of California.

Respondent Gregory Janis represented himself, and appeared by telephone from Henderson, Nevada.

Evidence was received, the record was closed, and the matter was submitted for decision on August 30, 2018.

**SUMMARY**

Mr. Janis seeks to transfer his Sea Cucumber Dive Permit to Connor Rhoads. It is undisputed Mr. Janis has landed no sea cucumbers under his Permit, and therefore does not satisfy the minimum number of landings requirement for transferring a sea cucumber dive permit. However, he seeks a "hardship" exception to that requirement based on health complications from which he suffers and which resulted in numerous hospitalizations. The statutory scheme providing for the transfer of sea cucumber dive permits does not provide any exceptions to the minimum number of landings requirement. Therefore, Mr. Janis's request to transfer his Permit to Mr. Rhoads must be denied.

## FACTUAL FINDINGS

### *Background*

1. At the end of 2013, Mr. Janis purchased a Sea Cucumber Dive Permit (Permit) with a \$30,000 loan. His brother had been a commercial sea cucumber diver for 20 years, and Mr. Janis intended to join him. The Department transferred the Permit into Mr. Janis's name on January 24, 2014.

2. Mr. Janis suffered severe health complications shortly after acquiring the Permit, which rendered him no longer able to join his brother as a commercial sea cucumber diver. Mr. Janis contacted the Department on February 6, 2014, and requested that his Permit be transferred to a third brother.

3. On May 9, 2014, the Department sent Mr. Janis correspondence denying his request to transfer his Permit to his brother, "because he did not possess a SCDP for four permit years or land at least 100 pounds of sea cucumbers in each of those permit years." The Department's denial was based on the following findings:

Department license records showed that Gregory Janis last held a valid SCDP during the 2013-2014 permit year. That permit expired on March 31, 2014.

Neil Janis does not possess a valid California Commercial Fishing License.

Department license records show that a 2013-2014 SCDP was transferred to Gregory Janis on January 27, 2014.

4. On December 24, 2014, Mr. Janis submitted to the Department a request to transfer his Permit to Connor Rhoads. On March 3, 2015, the Department sent Mr. Janis correspondence denying his request, "because he did not possess a SCDP for four permit years or land at least 100 pounds of sea cucumbers in each of those permit years." The Department's denial was based on the following findings:

Department license records show that Gregory Janis has a valid 2014-2015 SCDP and Sea Urchin Crewmember Permit.

Department landing records show no record of receipt number Z593056 on file.

5. On May 14, 2015, the Department received Mr. Janis's appeal of its denial of his request to transfer his Permit to Mr. Rhoads. On August 3, 2018, complainant signed the Statement of Issues, which seeks to deny Mr. Janis's request to transfer his Permit to Mr. Rhoads.

### *Evidence at Hearing*

6. Mr. Janis did not dispute the factual bases for the Department's denial of his request to transfer his Permit to Mr. Rhodes. He explained he was unable to make any landings under his Permit due to health complications which resulted in his hospitalization for several days on multiple occasions throughout 2014.

7. Instead, Mr. Janis requested a "hardship" exception to the minimum number of landings requirement for transferring a sea cucumber dive permit based on his health complications. He cited no authority for such an exception.

### *Discussion*

8. It is undisputed Mr. Janis has never landed any sea cucumbers under his Permit. It is also undisputed he suffers severe health complications, which resulted in his hospitalization for several days on multiple occasions during 2014. Unfortunately, there is no exception to the requirement that he "has previously held a valid sea cucumber permit for any four permit years and landed at least 100 pounds of sea cucumbers in each of those permit years" in order for him to be able to transfer his Permit to another person. Therefore, Mr. Janis's request to transfer his Permit to Connor Rhoads is denied.

## LEGAL CONCLUSIONS

### *Applicable Burden/Standard of Proof*

1. Mr. Janis has the burden of proving he meets the eligibility requirements for transferring his Permit, and he must do so by a preponderance of the evidence. (*Coffin v. Alcoholic Beverage Control Appeals Board* (2006) 139 Cal.App.4th 471, 476 [the party against whom a statement of issues is filed bears the burden of proof regarding the issues raised in the pleading]; see Evid. Code, § 115 ["Except as otherwise provided by law, the burden of proof requires proof by a preponderance of the evidence"].) This evidentiary standard requires Mr. Janis to produce evidence of such weight that, when balanced against evidence to the contrary, is more persuasive. (*People ex rel. Brown v. Tri-Union Seafoods, LLC* (2009) 171 Cal.App.4th 1549, 1567.) In other words, he need only prove it is more likely than not that he meets the eligibility requirements for transferring his Permit. (*Lillian F. v. Superior Court* (1984) 160 Cal.App.3d 314, 320.)

### *Applicable Law*

2. A valid sea cucumber permit is required in order for a person to take, possess aboard a boat, or land for commercial purposes sea cucumbers. (Fish & G. Code, § 8405, subd. (a).) A sea cucumber permit may be transferred "if the permittee has previously held a valid sea cucumber permit for any four permit years and landed at least 100 pounds of sea

cucumbers in each of those permit years, as documented by landing receipts with the name of the permittee shown on the receipts.” (Fish & G. Code, § 8405.2, subd. (a).)

.3. The Legislature did not provide for a hardship exception to the minimum number of landings requirement when it enacted Fish and Game Code section 8405.2, subdivision (a), and none can be read into it. (See *In re Miller* (1947) 31 Cal.2d 191, 199 [“Words may not be inserted in a statute under the guise of interpretation”].)<sup>1</sup>

### *Conclusion*

4. Mr. Janis’s request to transfer his Sea Cucumber Dive Permit to Connor Rhoads must be denied for the reasons explained in Factual Finding 8.

### ORDER

Respondent Gregory Janis’s request to transfer his Sea Cucumber Dive Permit to Connor Rhoads is DENIED.

DATED: September 14, 2018

DocuSigned by:

*Coren D. Wong*

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COREN D. WONG

Administrative Law Judge

Office of Administrative Hearings

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<sup>1</sup> At hearing, Mr. Janis asked why the Legislature did not provide for any exceptions to the minimum number of landings requirement. The legislative history for Fish and Game Code section 8405.2, subdivision (a), seems to indicate the Legislature’s intent in enacting the statute was to protect sea cucumbers from overfishing. (See Sen. Com. on Natural Resources and Wildlife, Analysis of A.B. No. 2628 (1995-1996 Reg. Sess.) June 11, 1996 [“According to a report prepared by a Department of Fish and Game biologist, sea cucumbers have a relatively short lifespan, a low maximum weight, a low age at first maturity, and a relatively high natural mortality. Species with these traits tend to have a low maximum yield and are particularly vulnerable to overfishing”].)