California Fish and Game Commission
Meeting Binder

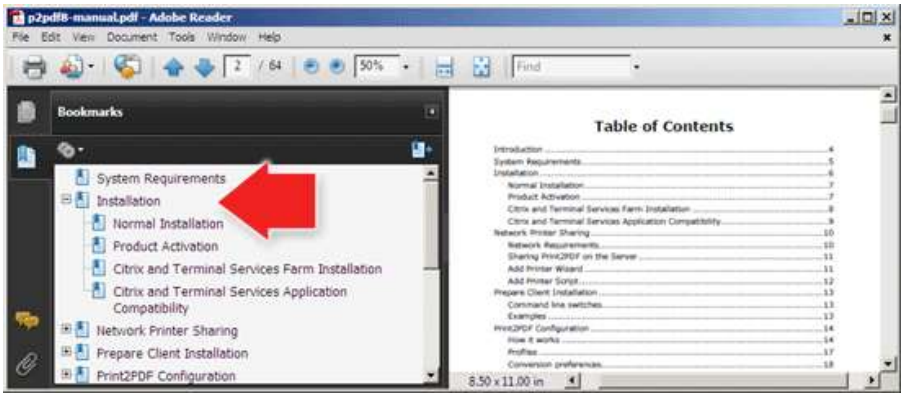
October 14, 2020
Webinar/Teleconference

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 TELECONFERENCE MEETING

- This year marks the beginning of the 150th year of 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 the Bagley-Keene Open Meeting Act and these proceedings are being recorded and broadcast.

- In the unlikely event of an emergency, please note the location of the nearest emergency exits at your location.

- Items may be heard in any order pursuant to the determination of the presiding commissioner.

- The amount of time for each agenda item may be adjusted based on time available and the number of speakers.

- We will ask how many speakers we have before taking public comment; please be prepared and listen closely for your name or phone number to be called.

- 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, 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 on the Commission's website.

- **Reminder!** Please silence your mobile devices and computers to avoid interruptions.

INTRODUCTIONS FOR FISH AND GAME COMMISSION MEETINGS

Fish and Game Commission

Eric Sklar	President (Saint Helena)
Samantha Murray	Vice President (Del Mar)
Jacque Hostler-Carmesin	Member (McKinleyville)
Vacant	Member
Peter Silva	Member (Jamul)

Commission Staff

Melissa Miller-Henson	Executive Director
Rachel Ballanti	Deputy Executive Director
Mike Yaun	Legal Counsel
Susan Ashcraft	Marine Advisor
Ari Cornman	Wildlife Advisor
Sherrie Fonbuena	Analyst
Cynthia McKeith	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	Deputy Director, Office of Legislation and External Affairs
Scott Gardner	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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_____

STATE OF CALIFORNIA
Gavin Newsom, Governor

Fish and Game Commission

Melissa Miller-Henson
Executive Director
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Sacramento, CA 94244-2090
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Celebrating 150 Years of
Wildlife Heritage and Conservation!

REVISED* MEETING AGENDA
October 14, 2020, 9:00 AM

Webinar and Teleconference

The California Fish and Game Commission is conducting this meeting by webinar and teleconference to avoid a public gathering and protect public health during the COVID-19 pandemic, consistent with Executive Order N-33-20.

Pursuant to Executive Order N-29-20, commissioners may participate in meetings remotely. The public may provide public comment during the public comment periods, and otherwise observe remotely consistent with the Bagley-Keene Open Meeting Act.

***This agenda is revised to add potential action under item 3 related to an administrative kelp bed and to add potential action for two appeals under executive session.**

The meeting will be live streamed; visit www.fgc.ca.gov the day of the meeting. To provide public comment during the meeting, please join via Zoom Webinar or by telephone. Please click here for instructions on how to join the meeting.

Note: See important meeting deadlines and procedures, including written public comment deadlines, starting on page 8. 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. General public comment for items not on agenda
Receive public comment regarding topics within the Commission's authority that are not included on the agenda.
Note: 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. Executive director's report

Receive updates from the executive director and possible action.

(A) Consider request to allow research under a Department-issued scientific collecting permit in Administrative Kelp Bed 3 in San Diego County, leased by KNOCEAN Sciences

CONSENT ITEMS

Note: Items on the consent calendar are expected to be routine and non-controversial. After public comment, the Commission will consider approving items on the consent calendar in a single vote without discussion. The presiding commissioner may choose to remove any item from the consent calendar and allow a separate discussion and potential action on that item in response to a request by a Commission member, staff, or interested person.

4. Recreational and commercial groundfish

Consider adopting proposed changes to regulations for the recreational and commercial take of federal groundfish and associated species.
(Amend sections 27.30, 27.35, 27.45, 28.27, 28.28, 28.54, 28.55, 28.65, and 150.16, Title 14, CCR)

5. Recreational purple sea urchin emergency (second 90-day extension)

Consider adopting a second 90-day extension of the emergency regulations concerning recreational take of purple sea urchin at Caspar Cove, Mendocino County.
(Amend Section 29.06, Title 14, CCR)

Staff is expected to recommend this item be removed from the agenda.

6. Wild Trout Waters

Receive Department recommendation and consider adopting proposed amendments to the Commission's Designated Wild Trout Waters policy.
(Pursuant to Section 1727, Fish and Game Code)

7. Department informational items

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

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

8. Tribal Committee

Discuss referred topics and consider revisions to topics and timing. Consider approving draft agenda topics for next committee meeting.

(A) Committee work plan
(B) Next committee meeting

9. Marine Resources Committee

Discuss referred topics and consider revisions to topics and timing. Consider approving draft agenda topics for next committee meeting.

(A) Committee work plan

(B) Next committee meeting

10. Recreational red abalone

Discuss proposed changes to the recreational red abalone fishery closure sunset date regulation.
(Amend 29.15 Title 14, CCR)

11. Recreational crab

Discuss proposed changes to recreational crab regulations intended to provide additional whale and turtle protections in the trap fisheries.
(Amend sections 29.80, 29.85, and 701, Title 14, CCR)

12. Recreational sea urchin

Discuss proposed changes to regulations concerning recreational take of sea urchin at Caspar Cove, Mendocino County, and Tanker Reef, Monterey County.
(Amend sections 29.05 and 29.06, Title 14, CCR)

13. Petitions for regulation change

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 #2020-007 AM1: Amend marine protected area regulations to allow surfboard fishing at the South La Jolla State Marine Reserve

II. Petition #2020-008: Suspend or reduce elk hunting in the Northwestern Elk Hunt Area due to disease

III. Petition #2020-010: Change the limit of wild rainbow and brown trout on the North Fork of the Stanislaus River and Beaver Creek to zero

(B) Action on pending regulation petitions referred to staff or the Department for review – *None scheduled at this time*

14. 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

(B) Action on pending non-regulatory requests referred to staff or the Department for review

15. Wildlife Resources Committee

Receive summary and consider approving recommendations from September 17, 2020 committee meeting. Discuss referred topics and consider revisions to topics and timing.

(A) Previous committee meeting report

(B) Committee work plan

16. Simplification of statewide inland sport fishing

Consider adopting proposed changes to inland sport fishing regulations.
(Add sections 5.84, 5.89, 7.40, and amend sections 3.00, 4.00, 5.00, 5.41, 5.85, 7.00, 7.50, and 8.10, Title 14, CCR)

17. Kenwood marsh checkerbloom

Receive overview of the Department's five-year status review of Kenwood marsh checkerbloom (*Sidalcea oregana* ssp. valida), which is listed as an endangered species under the California Endangered Species Act (CESA).
(Pursuant to Section 2077, Fish and Game Code)

18. Mohave desert tortoise

Consider and potentially act on the petition, Department's evaluation report, and comments received to determine whether changing the status of the Mohave desert tortoise (also known as Agassiz's desert tortoise; *Gopherus agassizii*) from threatened to endangered status under CESA may be warranted.
Note: If the Commission determines listing may be warranted, a one-year status review will commence before the final decision on listing is made.
(Pursuant to sections 2074 and 2074.2, Fish and Game Code)

19. Commission administrative items

Consider approving agenda topics for the next Commission meeting, changes to the rulemaking timetable, and whether there is any new business to be added to a future meeting agenda.

(A) Next meeting – December 9-10, 2020, webinar/teleconference
(B) Rulemaking timetable updates
(C) 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 actions taken during closed session.

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

- I. Dennis Sturgell v. California Department of Fish and Wildlife, and California Fish and Game Commission (revocation of Dungeness crab vessel permit No. CT0544-T1)
- II. Aaron Lance Newman v. California Fish and Game Commission (revocation of hunting and sport fishing privileges)
- III. Almond Alliance of California et al. v. California Fish and Game Commission and California Department of Fish and Wildlife (bumble bees California Endangered Species Act determination)

(B) Possible litigation involving the Commission

(C) Staffing

(D) Deliberation and action on license and permit items

- I. Consider the appeal filed by Robert Silva in Agency Case No. 20ALJ06-FGC regarding his request to renew his lobster operator permit
- II. Consider the appeal filed by Nicholas Perrone in Agency Case No. 20ALJ08-FGC regarding his request to renew his salmon vessel permit

California Fish and Game Commission
Meeting Schedule

Note: As meeting dates and locations can change, please visit www.fgc.ca.gov for the most current list of meeting dates and locations.

Meeting Date	Commission Meeting	Committee Meeting
November 9		**Tribal** Webinar/teleconference
November 10		**Marine Resources** Webinar/teleconference
December 9 - 10	Webinar/teleconference	
January 12, 2021		**Wildlife Resources** Webinar/teleconference
February 10-11, 2021	Webinar/teleconference	
March 16, 2021		**Marine Resources** Webinar/teleconference
April 13, 2021		**Tribal** Webinar/teleconference
April 14-15, 2021	Webinar/teleconference	
May 11, 2021		**Wildlife Resources** Webinar/teleconference
May 11, 2021	Webinar/teleconference	
June 16-17, 2021	Webinar/teleconference	
July 20, 2021		**Marine Resources** Sacramento
August 17, 2021		**Tribal** Sacramento
August 18-19, 2021	Sacramento	
September 16, 2021		**Wildlife Resources** Sacramento
October 13-14, 2021	Sacramento	
November 9, 2021		**Marine Resources** Sacramento
December 14, 2021		**Tribal** Sacramento
December 15-16, 2021	Sacramento	

OTHER MEETINGS OF INTEREST

Association of Fish and Wildlife Agencies

- September 12-15, 2021, Providence, RI

Pacific Fishery Management Council

- November 13-20, Garden Grove, CA
- March 3-10, 2021, Seattle, WA
- April 6-13, 2021, San Jose, CA
- June 22-29, 2021, Vancouver, WA
- September 8-15, 2021, Spokane, WA
- November 15-22, 2021, Costa Mesa, CA

Pacific Flyway Council

- March 9, 2021, Grand Rapids, MI
- August or September 2021, TBD

Western Association of Fish and Wildlife Agencies

- January 7-10, 2021, Santa Ana Pueblo, NM
- July 18-23, 2021 Santa Fe, NM

Wildlife Conservation Board

- November 18, Sacramento, CA
- 2021 TBD

Important Commission Meeting Procedures Information

Welcome to a Meeting of the California Fish and Game Commission
This year marks the beginning of the 151st 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 Department's Equal Employment Opportunity (EEO) Office at (916) 653-9089 or EEO@wildlife.ca.gov. Accommodation requests for facility and/or meeting accessibility and requests for American Sign Language (ASL) Interpreters should be submitted at least two weeks prior to the event. Requests for Real-Time Captioners should be submitted at least four weeks prior to the event. These timeframes are to help ensure that the requested accommodation is met. If a request for an accommodation has been submitted but is no longer needed, please contact the EEO Office immediately.

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, to sign up on our electronic mailing lists.

Submitting Comments on Agenda Items
The public is encouraged to comment on any agenda item. Verbal comments are only accepted during meetings. Written comments may be submitted by one of the following methods: E-mail to fgc@fgc.ca.gov; mail to California Fish and Game Commission, P.O. Box 944209, Sacramento, CA 94244-2090; or deliver (with an appointment during the COVID-19 pandemic) to California Fish and Game Commission, 1416 Ninth Street, Suite 1320, Sacramento, CA 95814. Materials provided to the Commission may be made available to the general public.

Written Comment Deadlines
The ***Written Comment Deadline*** for this meeting is **5:00 p.m. on October 1, 2020**. Written comments received at the Commission office by this deadline will be made available to Commissioners prior to the meeting.

The ***Supplemental Comment Deadline*** for this meeting is **noon on October 9, 2020**. Comments received by this deadline will be made available to Commissioners at the 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 https://fgc.ca.gov/Regulations/Petition-for-Regulation-Change. To be received by the Commission at this meeting, petition forms must have been delivered by the **Supplemental Comment Deadline**. Petitions received at this meeting will be scheduled for consideration at

the next regularly-scheduled business meeting, unless the petition is rejected under staff review pursuant to subsection 662(b), Title 14, CCR.

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 **Supplemental Comment Deadline** (or heard during general public comment at the meeting) will be scheduled for receipt at this meeting and scheduled for consideration at the next regularly-scheduled business meeting.

Speaking at the Meeting
To speak on an agenda item, please "raise" your hand either through the Zoom function or by pressing *9 once on your phone when prompted at the beginning of the agenda item.

1. Speakers will be called one at a time; please pay attention to 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. 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 ***Supplemental 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.
    b. An individual requiring an interpreter is entitled to at least twice the allotted time pursuant to Government Code Section 11125.7(c).
    c. An individual may receive additional time to speak to an agenda item at the request of any commissioner.

Visual Presentations/Materials
All electronic presentations must be submitted by the ***Supplemental 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.
2. All electronic formats must be Windows PC compatible.

STAFF SUMMARY FOR OCTOBER 14, 2020

2. GENERAL PUBLIC COMMENT

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

Receive public comment regarding topics within FGC authority that are not included on the agenda.

Summary of Previous/Future Actions

- **Today receive requests and comments** — Oct 14, 2020; Webinar/Teleconference
- Consider granting, denying, or referring — Dec 9-10, 2020; Webinar/Teleconference

Background

This item is to provide the public an opportunity to address FGC on topics not on the agenda. Staff may include written materials and comments received prior to the meeting as exhibits in the meeting binder (if received by written comment deadline), or as supplemental comments at the meeting (if received by the supplemental comment deadline).

Public comments are generally categorized into three types under general public comment: (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 or take action on 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 regular FGC meeting, following staff evaluation (currently Dec 9-10, 2020).

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 2-5.
2. Informational comments are provided as exhibits 6-19.
3. A request for non-regulatory action is summarized in Exhibit 20, and the original request is provided in exhibit 21.

Recommendation

***FGC staff*:** Consider whether to add any future agenda items to address issues that are raised during public comment.

Exhibits

1. Summary of new petitions for regulation change received by Oct 1, 2020 at 5:00 p.m.
2. Petition #2020-011 AM 1: Set precautionary commercial coonstripe shrimp trap fishing regulations, received Aug 12, 2020
3. Petition #2020-012 AM 1: Protect great white shark nursery grounds at Padaro Beach, Carpenteria, received Sep 1, 2020
4. Petition #2020-013: Removal of aquatic invasive species, received Sep 18, 2020 (Note: This petition was withdrawn by the petitioner on Oct 6, 2020.)
5. Petition #2020-014 AM 1: Recreational and research take of *Sargassum horneri*, received Sep 19, 2020
6. Email from Paul Weakland forwarding an article on depredation of sea lions by Washington, Oregon, Idaho, and Native American tribes, received Aug 15, 2020
7. Email from Marilyn Jasper bringing attention to short time allotments for public comment at FGC and WRC meetings and the challenges associated with time limits that change between agenda items in the same meeting, received Aug 20, 2020
8. Email from Carissa Pastor concerning urban coyote predation on house pets in the Torrance area, received Sep 1, 2020
9. Email from Mary Mote forwarding a letter to a lawyer concerning urban coyote predation on house pets in the Long Beach area, received Sep 1, 2020
10. Email from Harvey Sherback proposing a photovoltaic canal cover project, received Sep 2, 2020
11. Letter from Blaine Bonacci with questions and concerns about the cost and duration of fishing licenses, especially for those who are elderly and have lowered income, and a specific question about the legality of custom gear he is using, received Sep 4, 2020
12. Email from Eric Mills bringing attention to a recent article in Orion Magazine and recommending subscription to the magazine, received Sep 4, 2020
13. Email from Konstantin Karpov submitting to FGC comments previously provided to MRC regarding the Red Abalone Fisheries Management Plan; received Sep 11, 2020
14. Email from Mike Radis bringing attention to an individual displaying a giraffe on their property in the Malibu area without county or state permits, received Sep 14, 2020
15. Email from Ray Kennedy requesting not to delay or cancel lobster season, explaining that marketing concerns should be left to individual fishermen, and expressing support for a lobster tailing fishery, received Sep 23, 2020
16. Email from Paul Weakland forwarding a documentary, *World's Largest Floating Fish Factory*, received Sep 23, 2020
17. Email from Meyer Ranch expressing dissatisfaction with regulations promulgated by FGC, received Sep 28, 2020
18. Email from Eric Mills forwarding an essay by Terry Williams and encouraging participation in the upcoming election, received Sep 30, 2020
19. Email from Eric Mills containing a letter to the Castro Valley Forum editor criticizing live animal food markets and encouraging others to write the director of DFW and the secretary for Natural Resources, received Oct 1, 2020

20. Summary of requests for non-regulatory action received by Oct 1, 2020 at 5:00 p.m.
21. Email and application from Jeff Maassen to commercially harvest *Sargassum horneri* consistent with commercial kelp regulations, per Section 165(f), received Oct 1, 2020

Motion/Direction (N/A)

STAFF SUMMARY FOR OCTOBER 14, 2020

3. EXECUTIVE DIRECTOR'S REPORT

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

Receive updates from the executive director and possible action.

(A) Consider request to allow research under a DFW-issued scientific collecting permit in Administrative Kelp Bed No. 3 in San Diego County, leased by KNOCEAN Sciences

Summary of Previous/Future Actions (N/A)

Background

Justice, Equity, Diversity and Inclusion

The world is evolving in response to the social unrest and demands for greater equity and diversity, and FGC is no exception; FGC's core values compel us to respond, adapt, be more transparent, innovate, collaborate, and continuously improve in our efforts to engage and support a broad and diverse constituency. FGC executive staff has continued weekly learning sessions to expand our understanding of justice, equity, diversity and inclusion (JEDI) issues, and recently expanded the learning sessions to the full team. Consistent with FGC's direction, staff is scoping and drafting a plan for determining the elements of a JEDI plan and how best to engage commissioners, stakeholders, DFW, and the public; staff expects to have a draft plan for FGC consideration at the Dec 2020 FGC meeting.

In recognition of the changing times, and acknowledgment the 150-year history of our organizations, President Sklar and DFW Director Bonham recently co-authored a column for the latest issue of *Outdoor California* (Exhibit 1).

Decision-Making and Priorities

The number of topics coming before the three FGC committees has increased in recent years, contrasted against the reality of diminished staff capacities and increasing biological and administrative challenges. Yet, "What is important is seldom urgent and what is urgent is seldom important." Made famous by Dwight D. Eisenhower, though admittedly not his own words, the concept is a familiar one, especially during times when staffing and resources are limited.

The sense of importance and urgency is typically magnified when a topic is considered in isolation; when stacked with a full suite of potential topics, the magnification may diminish. As noted in Aug 2020, to help identify the most important workload, FGC staff is developing a tool to differentiate between those topics that are most important and urgently needed or those that are more conditional by applying a series of criteria. Sample criteria might include:

- Status of, and risk to, wildlife populations and other natural resources;
- regulatory deadlines, harvesting seasons, or other time-sensitive considerations;
- the estimated amount of time and work necessary to resolve the issue; and
- FGC and DFW staff capacities.

Staff suggests that committee priorities be reexamined during the respective committee update at each FGC meeting and seeks FGC input on potential criteria for such examination. Using input received today, a more fully developed proposal will be presented at the Dec 2020 FGC meeting.

FGC Delegations and Administrative Kelp Bed No. 3

Delegations

At its Jun 2020 meeting, FGC approved a number of delegations to its executive director related to regulations, adjudicatory matters, ongoing and pending litigation, the California Environmental Quality Act, contracts and procurement, interagency and external affairs, and general administration.

Your executive director took two significant actions in Aug and Sep 2020 under FGC's delegations, both related to the California Environmental Quality Act (CEQA):

1. Filed a negative declaration for the proposed changes to inland sport fishing regulations with the Office of Planning and Research State Clearinghouse (SCH # 2020090186) on Sep 9, 2020 for a 30-day public review; the notice was also provided to county clerks for public posting and posted on the FGC website.
2. Determined that the proposed recreational and commercial groundfish regulation changes are exempt from CEQA, pursuant to the statutory exemption in California Fish and Game Code Section 7078(e), and filed a notice of exemption with the Office of Planning and Research State Clearinghouse.

Authorization for Research in Leased Administrative Kelp Bed No. 3

FGC has authority to lease to any person the exclusive privilege to harvest kelp in any kelp bed, defined administratively in regulation (California Fish and Game Code Section 6700, and Title 14 Section 165.5). Standard lease terms define the use for which harvest is authorized in the bed, and require that a lessee obtain written FGC consent before using or permitting the lease area to be used for any other purpose.

DFW has approached FGC regarding a researcher at SeaWorld, San Diego, who seeks to harvest giant kelp under a scientific collecting permit (SCP) in an area that overlaps with Administrative Kelp Bed No. 3, which is leased to KNOCEAN Sciences, Inc. While DFW has authority to issue SCPs (pursuant to California Fish and Game Code sections 1002 and 1002.5, and Title 14 Section 650), DFW cannot issue the SCP until FGC provides written consent.

DFW has determined that the proposed harvest would not pose a resource concern and has obtained written consent from lessee KNOCEAN Sciences, Inc. for the use. Consistent with the lease terms, DFW seeks FGC written consent in order to enable DFW to approve collection under the SCP (see Exhibit 3 for DFW memo, kelp bed 3 lease, and email correspondence).

Staff has identified this situation as a further example of a delegable task, considered administrative in light of the oversight provided by DFW in issuing SCPs that normally do not engage FGC. The Jun 2020 FGC-approved delegations list related to contracts and procurement does not include providing authorization required under specific lease terms.

FGC may wish to consider granting the executive director authority to provide written FGC consent in the future through an action to revise the list of delegations; staff will bring proposed amendments to the Dec 2020 FGC meeting for initial consideration.

Staffing

With the long-term assignment of one of our regulatory analysts to COVID-19 tracing and a general reduction of staff time due to the personal leave program, staff continues to be challenged to address priority issues and be prepared to effectively take up sudden or unexpected additions to our workload. A good example of this is the hastily-scheduled stand-alone FGC meeting to take up the candidacy status of western Joshua tree. The ensuing emergency take provision created an additional workload, not only for FGC and FGC staff, but also DFW and its staff. To be better prepared to address such incidents, increasing capacity is a priority.

Efforts have begun to recruit for a seasonal clerk; this position will help staff in a wide array of basic clerical and administrative tasks, from records management and filing of documents to preparing and posting items to the FGC webpage. Staff expects to hold interviews in the coming weeks.

Staff participated in interviews for next year's California Sea Grant State Fellow. After a robust initial screening process, staff conducted numerous encouraging interviews. This is the fourth year that FGC has participated in the program and this year's candidate pool continues to impress. The fellow is expected to start in early 2021.

Staff recently received good news that DFW identified a vacant position for the long-awaited tribal advisor and liaison position. Efforts are underway to transfer the position and associated funding to FGC so that recruitment efforts can begin as soon as possible.

Legislative Matters

DFW provided a report on state bills of interest to DFW during the last legislative session, including the final status of each (Exhibit 4). FGC staff identified state legislation that may affect FGC's resources and workload or be of interest, but relies heavily on colleagues at DFW to monitor and track legislation.

Sep 30 was the last day for Governor Newsom to sign or veto bills passed by the California State Legislature. In the final days of session, only a single bill in FGC's list of interest passed and was then signed by Governor Newsom, AB 1949 (*Boerner Horbath*) *Fisheries: California Ocean Resources Enhancement and Hatchery Program.* The legislature adjourns Nov 30 and will convene the 2021-22 session on Dec 7.

Significant Public Comments

1. Concerns with AB 1175 related to a ban on importing or possessing certain African species (often referred to as trophy hunting) are shared through a CalMatters article, *Ban on Hunting Trophies Risks Funding for Healthy African Ecosystems* (Exhibit 4). Note that AB 1175 did not reach the governor's desk.

Recommendation

FGC staff: Approve the request to allow giant kelp harvest for research purposes by Sea World, San Diego under a DFW-issued SCP in Administrative Kelp Bed 3 in San Diego County, and direct staff to provide written authorization.

Exhibits

1. Column by FGC President Sklar and DFW Director Bonham, *Outdoor California,* published Sep 2020
2. *Staff Report on Staff Time Allocation and Activities*, dated Oct 5, 2020
3. DFW memo and attachments regarding allowing research take in Administrative Kelp Bed No. 3, received Oct 7, 2020
4. DFW final legislative report for the 2019-20 session, dated Oct 1, 2020
5. Email and attachment from Kathy Lynch, Lynch & Associates, received Aug 27, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission approves the request for KNOCEAN Sciences, Inc. to allow giant kelp removal by SeaWorld, San Diego in Administrative Kelp Bed No. 3 for purposes prescribed through a scientific collecting permit issued by the California Department of Fish and Wildlife.

4. RECREATIONAL AND COMMERCIAL GROUNDFISH (CONSENT)

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

Consider adopting proposed changes to regulations for the recreational and commercial take of federal groundfish and associated species.

Summary of Previous/Future Actions

- Notice hearing — Jun 24-25, 2020; Webinar/Teleconference
- Discussion hearing — Aug 19-20, 2020; Webinar/Teleconference
- **Today's adoption hearing** — **Oct 14, 2020; Webinar/Teleconference**

Background

FGC biennially adopts recreational and commercial fishing regulations for federal groundfish and associated species as necessary for consistency with federal rules that go into effect Jan 1 of odd-numbered years.

At its Jun 2020 meeting, the Pacific Fishery Management Council recommended recreational fishing regulations for federally-managed groundfish species for the 2021-2022 seasons, which are expected to go into effect Jan 1, 2021. DFW is proposing regulatory changes that would make recreational regulations for state waters consistent with federal regulations. In addition, DFW is proposing modifications to the state-defined commercial trip limit for cabezon and greenling to stay within federally-established commercial harvest limits.

Proposed Regulations

The proposed regulations will adjust allowable depths in three groundfish management areas; adjust bag limits for five species; update method of take for one species; and increase the commercial trip limits for two species. The detailed proposed changes are provided in the initial statement of reasons (ISOR; Exhibit 2).

Significant Public Comments (N/A)

Recommendation

FGC staff: Under a motion to adopt the consent calendar, adopt the proposed recreational and commercial groundfish regulations as recommended by DFW.

DFW: Adopt the regulations as proposed in the ISOR (Exhibit 2)

Exhibits

1. DFW memo transmitting ISOR, received Jul 23, 2020
2. ISOR
3. Economic and fiscal impact statement (STD 399)
4. DFW email in lieu of a pre-adoption statement of reasons, received Oct 1, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission adopts the staff recommendations for items 4-6 on the consent calendar.

STAFF SUMMARY FOR OCTOBER 14, 2020

5. RECREATIONAL PURPLE SEA URCHIN EMERGENCY (SECOND 90-DAY EXTENSION) (CONSENT)

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

Consider adopting a second 90-day extension of the emergency regulations concerning recreational take of purple sea urchin at Caspar Cove, Mendocino County.

FGC staff recommends this item be removed from the agenda.

Summary of Previous/Future Actions

• Adopted emergency regulations	Feb 21, 2020; Sacramento
• Adopted extension of emergency regulations	Aug 19-20, 2020; Webinar/Teleconference
• **Today's potential emergency re-adoption**	**Oct 14, 2020; Webinar/Teleconference**

Background

At its Feb 2020 meeting, FGC adopted emergency regulations to remove the recreational bag limit for purple sea urchin at Caspar Cove, Mendocino County. The action was taken in response to poor conditions of northern California kelp forests. FGC adopted the emergency regulation to explore and evaluate whether intensified removal of purple sea urchin may promote the recovery of kelp and the associated species that kelp supports.

The original emergency action was set to expire on Sep 14, 2020. Staff developed a plan to request two subsequent 90-day extensions to allow the urchin removal work to continue for up to a year under the emergency regulation. Efforts are also underway to make this rulemaking permanent (Agenda Item 12 for this meeting).

FGC approved the first of two expected extensions at its Aug 2020 meeting; a second extension was planned for today's meeting. Due to Governor Newsom's Executive Orders N-40-20 and N-66-20, the original emergency has been extended by 120 days, and a second readoption of the emergency action is therefore unnecessary as staff expects the permanent rulemaking to be approved and effective before the emergency expires.

Significant Public Comments (N/A)

Recommendation

***FGC staff*:** Remove this item from the agenda.

Exhibits (N/A)

Motion/Direction

Not applicable if removed from the agenda under item 1.

6. WILD TROUT WATERS (CONSENT)

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

Receive DFW recommendation and consider adopting proposed amendments to FGC's Designated Wild Trout Waters policy.

Summary of Previous/Future Actions (N/A)

Background

California Fish and Game Code Section 7260(c), grants FGC the authority to designate Heritage Trout Waters recognizing the beauty, diversity, historical significance, and special value of California's native trout. Designations are limited to waters that support populations that best exemplify indigenous strains of native trout within their historic drainages and that provide anglers with an opportunity to catch native trout in a manner consistent with their conservation. Any stocking of heritage trout waters shall meet the criteria established by Chapter 7.2, commencing with Section 1725, of the California Fish and Game Code.

California Fish and Game Code Section 1727(b) requires that DFW annually submit to FGC a list of no less than 25 miles of stream or stream segments and at least one lake deemed suitable for designation as wild trout waters. Fish and Game Code, Section 1727(c) allows the Commission to remove designated Wild Trout Waters from the wild trout program, but mandates that an equivalent number of miles are added.

DFW proposes removing:

1. East Fork Carson River, from Hangman's Bridge near Markleeville downstream to the Nevada state line (Alpine County).

Rationale for the removal can be found in Exhibit 1.

DFW proposes additing three new waters:

1. Tuolumne River from Wards Ferry Bridge (Don Pedro Reservoir) upstream to the boundary of Yosemite National Park, excluding tributaries (Tuolumne County);
2. Wolf Creek from Forest Service Road 062 crossing to Wolf Creek Lake (Mono County); and
3. Butte Lake (Lassen County).

Exhibit 1 provides more detail on the proposed changes. Exhibit 2 is the Wild Trout Waters Policy text with proposed amendments, and Exhibit 3 provides maps of the proposed waters.

Significant Public Comments (N/A)

Recommendation

***FGC staff*:** Under a motion to adopt the consent calendar, approve amendments to the Commission Designated Wild Trout Waters policy as described in this staff summary and the DFW proposal.

DFW: Approve the recommended amendments.

Exhibits

1. DFW memo, received Oct 7, 2020
2. Proposed policy text, received Oct 7, 2020
3. Maps of waters for removal and designation, received Oct 7, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission adopts the staff recommendations for items 4-6 on the consent calendar.

STAFF SUMMARY FOR OCTOBER 14, 2020

7. 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) Marine Region
(D) Wildlife and Fisheries Division, and Ecosystem Conservation Division

Summary of Previous/Future Actions (N/A)

Background

Verbal reports are expected at the meeting for items (A) through (D). A DFW news release of interest is provided as Exhibit D1.

The Marine Region report will include an update on DFW implementation of the Drift Gill Net Transition Program (Exhibit C1), which incentivizes drift gillnet permittees to transition out of the drift gillnet shark and swordfish fishery, reduces bycatch, and provides for a sustainable swordfish fishery. Directed through legislation in 2018, DFW adopted regulations establishing the program in late 2019.

Significant Public Comments

1. Oceana announced $1 million in funding for the DFW Drift Gill Net Transition Program to match state funding (Exhibit C2).

Recommendation (N/A)

Exhibits

C1. DFW Drift Gill Net Transition Program Update, dated Oct 14, 2020
C2. Email from Geoff Shester, dated Sep 14, 2020
D1. DFW news release: *CDFW Seeks Authority to Refund Elk, Pronghorn Tags for Areas Impacted by Wildfires, Forest Closures,* dated Sep 21, 2020

Motion/Direction (N/A)

8. TRIBAL COMMITTEE (TC)

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

Discuss referred topics and consider revisions to topics and timing. Consider approving draft agenda topics for next committee meeting.

Summary of Previous/Future Actions

• Most recent TC meeting	Aug 18, 2020; TC, Webinar/Teleconference
• **Today consider approving TC agenda topics**	**Oct 14, 2020; Webinar/Teleconference**
• Next TC meeting	Nov 9, 2020; TC, Webinar/Teleconference

Background

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

Committee Work Plan

Topics that have been referred from FGC to TC are displayed within a work plan to help with scheduling and tracking and to keep the public informed about upcoming discussions.

Next Committee Meeting

The next meeting is scheduled for Nov 9, 2020 as a webinar/teleconference. In addition to standing agenda items (agency updates, DFW management plan updates, cross-pollination with MRC and WRC, future meetings and agenda items), several agenda topics are proposed:

- Discuss co-management implementation and potential changes to the definition
- Discuss kelp and algae harvest regulations
- Discuss pinnipeds and California's fisheries
- Update on MRC's Coastal Fishing Communities Project
- Update on kelp recovery efforts at Casper Cover and Tanker Reef
- Discuss wildfire impacts and the state's response

Significant Public Comments (N/A)

Recommendation

FGC staff: (1) Discuss referred topics and consider any revisions to the topics or their timing as identified in the work plan, and (2) approve the draft Nov TC agenda topics as proposed.

Exhibits

1. TC work plan, updated Aug 21, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission approves the topics for the November 9, 2020 Tribal Committee meeting as discussed today.

9. MARINE RESOURCES COMMITTEE (MRC)

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

Discuss referred topics and consider revisions to topics and timing. Consider approving draft agenda topics for next MRC meeting.

Summary of Previous/Future Actions

- Previous MRC meeting — Jul 29, 2020; MRC, Webinar/Teleconference
- **Today consider approving agenda topics** — **Oct 14, 2020; Webinar/Teleconference**
- Next MRC meeting — Nov 10, 2020; MRC, Webinar/Teleconference

Background

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

Committee Work Plan

Topics that have been referred from FGC to the MRC are displayed within a work plan to help with scheduling and tracking.

New MRC Topics

No additional topics are proposed for referral to MRC at this time.

Next Committee Meeting

The next meeting is scheduled for Nov 10, 2020 as a webinar/teleconference. Four discussion topics and four updates are proposed:

- Update on MLMA master plan for fisheries implementation
- Consider potential recommendation for California grunion recreational fishing regulation changes
- Consider potential recommendation for rulemaking on provisions for operation, maintenance, and repair of pre-existing artificial structures in marine protected areas
- Consider potential recommendation to rescind or continue temporary hiatus on receipt of new state water bottom lease applications
- Staff and agency updates, including:
  - Aquaculture principles and action plan development
  - Red abalone fishery management plan development
  - Commercial kelp and algae harvest regulations development
  - California's Coastal Fishing Communities project

Significant Public Comments (N/A)

Recommendation

FGC staff: Approve the draft Nov MRC agenda topics as proposed or as modified.

Exhibits

1. MRC work plan, updated Sep 4, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission approves the topics for the November 10, 2020 Marine Resources Committee meeting as discussed today.

STAFF SUMMARY FOR OCTOBER 14, 2020

10. RECREATIONAL RED ABALONE

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

Discuss proposed changes to the recreational red abalone fishery closure sunset date regulation.

Summary of Previous/Future Actions

• FGC adopted emergency regulation to close recreational red abalone fishery for one year	Dec 7, 2016, San Diego
• FGC adopted regular rulemaking to extend closure to 2021	Dec 12-13, 2018, Oceanside
• DFW presentation on fishery status	Jun 24-25, 2020; Webinar/Teleconference
• Notice hearing	Aug 19-20, 2020; Webinar/Teleconference
• **Today's discussion hearing**	**Oct 14, 2020; Webinar/Teleconference**
• Adoption hearing	Dec 9-10, 2020; Webinar/Teleconference

Background

Red abalone fishery management is currently guided by the Abalone Recovery and Management Plan (ARMP). The recreational red abalone fishery was closed in 2017, following dramatic environmental conditions leading to extensive loss of bull kelp beds and significant abalone die-off (see Exhibit 1 for additional background).

DFW recently confirmed that poor conditions continue to persist or worsen and advised that continuing the closure is necessary. The proposed regulation would extend the closure, currently due to sunset on Apr 1, 2021, for another five years with a new sunset date of Apr 1, 2026. The extension will facilitate recovery of the red abalone population while preparation of a red abalone fishery management plan is underway.

Significant Public Comments

A commenter opposes the extension of the closure of the red abalone fishery, stating there are enough abalone for the fishery to reopen (Exhibit 4).

Recommendation (N/A)

Exhibits

1. Staff summary from Aug 22-23, 2018 meeting (for background purposes only)
2. DFW memo, received Aug 6, 2020
3. Initial statement of reasons
4. Email from Rick Meyer, received Sep 20, 2020

Motion/Direction (N/A)

11. RECREATIONAL CRAB

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

Discuss proposed changes to recreational crab regulations intended to provide additional whale and turtle protections in trap fisheries.

Summary of Previous/Future Actions

• FGC/MRC considered management measures for the recreational fishery	Apr 2019- Feb 2020; various locations
• MRC update and recommendation	Mar 17, 2020; MRC, Santa Rosa/ Webinar/Teleconference
• FGC approved MRC recommendations	Apr 15-16, 2020; Teleconference
• FGC provided direction on regulatory options and continued notice hearing to Aug 2020	Jun 24-25, 2020; Webinar/Teleconference
• MRC received DFW update regarding crab species for rulemaking	Jul 29, 2020; MRC, Webinar/Teleconference
• Notice hearing	Aug 19-20, 2020; Webinar/Teleconference
• **Today's discussion hearing**	**Oct 14, 2020; Webinar/Teleconference**
• Adoption hearing	Dec 9-10, 2020; Webinar/Teleconference

Background

In early 2019, FGC initiated discussions about potential management measures for the recreational Dungeness crab fishery to minimize risks of whale entanglements in fishing gear. Management options developed by DFW were explored and refined at various FGC and MRC meetings in 2019 and 2020. Additional background information is provided in Exhibit 1.

Proposed Regulations

The proposed regulations in Exhibit 3 include several provisions, which are summarized in Exhibit 1:

- Enhanced gear marking
- Service interval
- Trap limit
- Director authority to delay the fishery opener or close the season early after consultation with the FGC president, and requirement to report to FGC at the meeting following any action(s) taken
- Trap validation program

Significant Public Comments

1. A commercial passenger fishing vessel (CPFV) operator states there is very little evidence to suggest California recreational gear poses any serious threat to whales or sea turtles and that it is unfair to the recreational sector to treat recreational and commercial gear the same; he recommends implementing the gear marking requirements first to determine the actual risk of entanglement from recreational gear. Additionally, he states that requiring passengers on CPFVs to hold a validation stamp will result in lost revenue to CPFVs and suggests instead that CPFVs be charged a one-time fee for 60 validations. (Exhibit 6)
2. A CPFV owner/operator states that the cost for new buoy marking requirements is greatly underestimated because the marker buoy cannot simply be added to the main buoy, so CPFVs will need to purchase new main buoys and line. He adds that estimates do not include paying deck hands to tie, paint and mark the buoys and that red buoys are not available in sufficient quantities for the 2020 season. He requests that the validation be added to the "Lifetime License Holders package." (Exhibit 7)

Recommendation (N/A)

Exhibits

1. Staff summary from Aug 19-20, 2020 FGC meeting (for background purposes)
2. DFW memo, received Aug 12, 2020
3. Initial statement of reasons
4. Economic and fiscal impact statement (Std. 399)
5. DFW presentation
6. Email to DFW from Andy Guiliano, Fish Emeryville, received Aug 25, 2020
7. Email from Tom Mattusch, F/V Huli Cat, received Aug 30, 2020

Motion/Direction (N/A)

12. RECREATIONAL SEA URCHIN

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

Discuss proposed changes to regulations concerning recreational take of sea urchin at Caspar Cove, Mendocino County, and Tanker Reef, Monterey County.

Summary of Previous/Future Actions

• Adopted emergency regulations for unlimited take of purple sea urchin at Caspar Cove	Feb 21, 2020; Sacramento
• Adopted 90-day extension of emergency regulations for unlimited take of purple sea urchin at Caspar Cove	Aug 19-20, 2020; Webinar/Teleconference
• Notice hearing for Caspar Cove and Tanker Reef regulation change	Aug 19-20, 2020; Webinar/Teleconference
• Consider 90-day extension of emergency regulations at Caspar Cove (Agenda Item 5, today's meeting)	Oct 14, 2020; Webinar/Teleconference
• **Today's discussion hearing**	**Oct 14, 2020; Webinar/Teleconference**
• Adoption hearing	Dec 9-10, 2020; Webinar/Teleconference

Background

At its Aug 2020 meeting, FGC authorized notice of action to amend regulations to remove bag limits for take of sea urchin at two locations for a period of three years. The action serves to make permanent an emergency action taken earlier this year to remove the bag limit for take of purple sea urchin at Caspar Cove, Mendocino County. Additionally, in response to FGC Petition #2020-001, FGC's action authorized notice to remove the bag limit for purple sea urchin and red sea urchin at Tanker Reef, Monterey County. See Exhibit 1 for additional background.

FGC authorized notice based on details provided in a DFW memo (Exhibit 2); DFW has transmitted an initial statement of reasons (ISOR) detailing the proposed changes (exhibits 3 and 4). The proposed actions were published in the California Notice Registry on Oct 9, 2020. If approved, the regulations will sunset on Apr 1, 2024.

Significant Public Comments (N/A)

Recommendation (N/A)

Exhibits

1. Staff summary from Aug 19-20, 2020 FGC meeting (for background purposes only)
2. DFW memo requesting authorization for notice, received Aug 5, 2020
3. DFW memo transmitting ISOR, received Sept 25, 2020

4. ISOR
5. Draft economic and fiscal impact statement (Std. 399)
6. DFW presentation

Motion/Direction (N/A)

13. 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. For this meeting:

(A) Action on petitions received at the Aug 2020 meeting

(B) Pending regulation petitions referred to staff or DFW for review – *None scheduled*

Summary of Previous/Future Actions

- FGC received petitions — Aug 19-20, 2020; Webinar/Teleconference
- **Today's action on petitions** — **Oct 14, 2020; Webinar/Teleconference**

Background

Pursuant to Title 14 Section 662, 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." Petitions received at an FGC meeting are scheduled for consideration at the next business meeting under (A), 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 a committee, staff or DFW for further evaluation or information-gathering. Referred petitions are scheduled for action under (B) once the evaluation is completed and recommendation made.

(A) ***Petitions for regulation change.*** Three petitions received at the Aug 2020 meeting are scheduled for action:

I. Petition #2020-007 AM 1: Amend marine protected area regulations to allow surfboard fishing at the South La Jolla State Marine Reserve (Exhibit 2)

II. Petition #2020-008: Suspend or reduce elk hunting in the Northwestern Elk Hunt Area due to disease (Exhibit 3)

III. Petition #2020-010: Change the limit of wild rainbow and brown trout to zero for the North Fork of the Stanislaus River and Beaver Creek (Exhibit 4)

For background purposes, material presented at the Sep 2020 WRC meeting regarding Petition #2020-008 is provided in Exhibit 5. Petition #2020-009 was withdrawn by the petitioner on Sep 18, 2020. Staff recommendations and rationales are provided in Exhibit 1.

Significant Public Comments

With respect to Petition #2020-008, a commenter expresses concern about elk numbers in the Del Norte herd, the effects that trepaneme-associated hoof disease may have, the effects of domestic livestock, and urges FGC to postpone elk hunting until a disease management plan is developed (Exhibit 6).

Recommendation

***FGC staff*:** Adopt the staff recommendations as reflected in Exhibit 1.

***WRC*:** Deny Petition #2020-008 based on information presented by DFW at the Sep 17, 2020 WRC meeting.

Exhibits

1. Table of petitions for regulation change, updated Oct 6, 2020
2. Petition #2020-007 AM 1, received Jul 10, 2020
3. Petition #2020-008, received Jun 10, 2020
4. Petition #2020-010, received Jul 28, 2020
5. Staff summary, agenda item 5, from Sep 17, 2020 WRC meeting, and select exhibits for background purposes
6. Letter from Janet Gilbert, received Sep 4, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission adopts the staff recommendations as reflected in Exhibit 1.

OR

Moved by _____ and seconded by _____ that the Commission adopts the staff recommendations as reflected in Exhibit 1, except for petition(s) #_____ for which the action is _____.

STAFF SUMMARY FOR OCTOBER 14, 2020

14. NON-REGULATORY REQUESTS

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

This is a standing agenda item for FGC to act on non-regulatory requests received from the public.

Summary of Previous/Future Actions

- FGC received requests — Aug 19-20, 2020; Webinar/Teleconference
- **Today's potential action on requests** — **Oct 14, 2020; Webinar/Teleconference**

Background

FGC provides direction regarding requests from the public received by mail, email, and during general public comment 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 2020 meeting in one of three ways: (1) submitted by the comment deadline and published in a table in the meeting binder, (2) submitted by the supplemental comment deadline and delivered at the meeting, or (3) received during public comment at the meeting.

Today, two non-regulatory requests are scheduled for action. Exhibit 1 summarizes the requests and contains the staff recommendations. See Exhibit 2 for a written response from DFW to one of the requestors.

(B) ***Pending non-regulatory requests***. This item is an opportunity for staff to provide an update or 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 pending requests are scheduled for action today.

Significant Public Comments (N/A)

Recommendation

FGC staff: Adopt the staff recommendations as reflected in Exhibit 1.

Exhibits

1. Summary of non-regulatory requests and staff recommendations for requests received through Aug 20, 2020, dated Oct 5, 2020
2. Letter from DFW to Morgan Patton regarding take at Duxbury Reef State Marine Conservation Area, dated Aug 18, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission adopts the staff recommendations for action on the October 2020 non-regulatory requests.

OR

Moved by _____ and seconded by _____ that the Commission adopts the following actions on the October 2020 non-regulatory requests: _____.

15. WILDLIFE RESOURCES COMMITTEE (WRC)

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

Receive summary and consider approving recommendations from September 17, 2020 committee meeting. Discuss referred topics and consider revisions to topics and timing.

Summary of Previous/Future Actions

- Previous WRC meeting — Sep 17, 2020; WRC, Webinar/Teleconference
- **Today consider WRC recommendations** — **Oct 14, 2020; Webinar/Teleconference**
- Next WRC meeting — Jan 12, 2021; WRC, Webinar/Teleconference

Background

WRC works under FGC direction to set and accomplish its work plan (Exhibit B1).

(A) Previous Committee Meeting

WRC met on Sep 17 via webinar and teleconference and covered:

- Updates and recommendations for periodic regulatory packages, including mammal hunting, waterfowl hunting, Central Valley sport fishing, Klamath River Basin sport fishing, and inland sport fishing;
- information concerning extant wildlife diseases in California and a recommendation regarding Petition #2020-008 related to an elk hunting moratorium;
- discussion of a potential rulemaking involving restricted species;
- discussion of human-wildlife conflict issues; and
- update on the bullfrog and non-native turtle stakeholder engagement process.

A written summary of the meeting is provided as Exhibit A1.

WRC Recommendations

The WRC developed three recommendations for FGC consideration:

1. Support and issue a notice of proposed rulemaking for the proposed regulation changes for the mammal package as discussed, including (a) targeted reductions in antelope and deer tags, and (b) partial refunds and restoration of preference points for unused elk and antelope tags in selected hunts.
2. Support the proposed regulation changes for waterfowl hunting, Central Valley Chinook sport fishing, and Klamath River Basin sport fishing for the 2021-22 seasons, as recommended by DFW.
3. Deny petition #2020-008, as the affects of wildlife disease have already been incorporated into the harvest model through general mortality calculations.

(B) Committee Work Plan

The WRC work plan (Exhibit B1) includes topics and timelines for items referred by FGC to WRC and is updated to reflect proposed changes.

New WRC Topics

No additional topics are proposed at this time.

Significant Public Comments (N/A)

Recommendation

FGC staff: Adopt recommendations one and two, and take up recommendation three under Agenda Item 13 for this meeting, *Petitions for regulation change*.

Exhibits

A1. Summary of Sep 17, 2020 WRC meeting
B1. WRC work plan, updated Oct 5, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission approves recommendations one and two from the September 17, 2020 Wildlife Resources Committee meeting.

OR

Moved by _____ and seconded by _____ that the Commission approves the recommendations from the September 17, 2020 Wildlife Resources Committee meeting as recommended except for _____ for which it approves _____.

16. SIMPLIFICATION OF STATEWIDE INLAND SPORT FISHING

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

Consider adopting proposed changes to inland sport fishing regulations.

Summary of Previous/Future Actions

- WRC vetting — Jan 16, 2020; WRC, Long Beach
- WRC vetting — Mar 5, 2020, WRC, Sacramento
- Notice hearing — Jun 24-25, 2020; Webinar/Teleconference
- Discussion hearing — Aug 19-20, 2020; Webinar/Teleconference
- **Today's adoption hearing — Oct 14, 2020; Webinar/Teleconference**

Background

For many years, anglers have expressed frustration with the complexity of freshwater sport fishing regulations. Some people are dissuaded from fishing due to actual or perceived difficulty in complying with the regulations.

To address the concerns FGC and DFW have heard over the years, DFW held a series of community meetings in 2018 and 2019 at locations across the state to publicly introduce and discuss proposed changes to simplify statewide inland sport fishing regulations. DFW proposals and recommendations from the public were then vetted at the Jan 2020 and Mar 2020 WRC meetings, and FGC approved a notice of proposed rulemaking at its Jun 2020 meeting.

The goals of the proposed changes are to increase regulatory consistency statewide, reduce the complexity of inland sport fishing regulations, and remove regulations that are no longer biologically justifiable. The major proposed regulatory changes:

- separate the regulations for inland trout (non-anadromous waters) from those for steelhead and salmon (anadromous waters) to help provide greater clarity for anglers;
- replace the district regulations with statewide regulations separated for trout; and
- standardize and consolidate the "special fishing" regulations.

Updates to the proposed rulemaking since the Aug 2020 discussion hearing are described in a pre-adoption statement of reasons (PSOR) (Exhibit 1). The PSOR identifies non-substantive changes to the originally-noticed text, including consistent abbreviations for days, months, numbering, and references to other sections of Title 14. Corrections to duplicate language, references to amended subsection numbers, and spelling and punctuation have also been identified and noted by page number.

The originally-proposed rulemaking presented two options for the Truckee River. After the notice hearing, DFW staff, FGC staff, and representatives of Montna Farms met and identified a compromise between two options that was acceptable to each party. The compromise was introduced and discussed at the Aug 2020 FGC meeting; a description of the compromise and the proposed regulatory text can be found in Exhibit 1. FGC staff supports the compromise.

Pursuant to the California Environmental Quality Act and FGC's delegations to its executive director, FGC staff filed a negative declaration for the proposed changes to inland sport fishing regulations (Exhibit 3) with the State Clearinghouse (SCH # 2020090186) on Sep 9, 2020 for a 30-day public review; the notice was also provided to county clerks for public posting and posted on the FGC website. No comments on the draft negative declaration have been received to date.

Significant Public Comments

1. Employees and guests of Brown's Owens River Campground wrote to oppose the proposed changes to the Upper Owens River, from the bridge at Benton Crossing Road south through Brown's Campground. The DFW proposal would stop bait fishing through the campground on July 31 of each year. The commenters state that bait fishing is a valuable opportunity for campers, especially those with children, who learn to fish an easily accessible river using bait. See Exhibit 4.
2. California Trout supports much of the overall proposal to simplify statewide inland fishing regulations. However, the organization requests year-round angling with barbless, artificial lures only for the Fall River Complex. CalTrout also continues to express concerns with:
    - the DFW-proposed amendments for the Truckee River, requesting specific changes to support wild trout conservation;
    - the Upper Sacramento River changes, suggesting a single regulation instead of three; and
    - the proposal for the East Walker, Mokelumne and East Fork Carson rivers, advocating for catch and release angling.

    See Exhibit 5.
3. The Fall River Conservancy opposes the DFW proposed amendments regarding the Fall River in Shasta County, expressing a concern that allowing all-year angling would likely present a serious risk to the spawning season. The conservancy adds that Fall River has a robust waterfowl hunting season in the late fall, and opening the river to unlimited angling during the waterfowl season would present public safety and other concerns. See Exhibit 6.

DFW has responded to both of the Fall River comments in Exhibit 1.

Recommendation

***FGC staff*:** Adopt the negative declaration, approve the proposed project, and adopt the proposed changes to inland sport fishing regulations as modified in Exhibit 2 (which includes the Truckee River compromise).

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

Exhibits

1. Pre-adoption statement of reasons
2. Pre-adoption proposed regulatory language

3. Draft negative declaration
4. Emails from Kelli Brown, family and friends, received Sep 23, 2020
5. Email from Patrick Samuel, Bay Area Director, California Trout, received Sep 30, 2020
6. Email from Rodney Peck, President, Fall River Conservancy, received Sep 29, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission adopts the negative declaration prepared pursuant to the California Environmental Quality Act, approves the proposed project, and adopts proposed changes to Sections 3.00, 4.00, 5.00, 5.41, 5.85, 7.00, 7.50 and 8.10, and the addition of Sections 5.84, 5.89 and 7.40, Title 14, California Code of Regulations, related to the simplification of statewide inland sport fishing.

17. KENWOOD MARSH CHECKERBLOOM

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

Receive overview of the Department's five-year status review of Kenwood Marsh checkerbloom (*Sidalcea oregana* ssp. *valida*), which is listed as an endangered species under the California Endangered Species Act (CESA).

Summary of Previous/Future Actions

• Determined listing Kenwood Marsh checkerbloom as endangered was warranted	Nov 5, 1981
• Received five-year status review report	Aug 19-20, 2020; Webinar/Teleconference
• DFW transmitted to FGC erratum and corrected five-year status review	Sep 17, 2020
• **Today receive DFW presentation**	**Oct 14, 2020; Webinar/Teleconference**

Background

Kenwood Marsh checkerbloom is a long-lived perennial herb in the mallow family that is restricted to eastern Sonoma County in Kenwood Marsh and Knights Valley. FGC listed Kenwood Marsh checkerbloom as an endangered species under CESA in 1981, and it is currently included in the list of endangered plants (Title 14, Section 670.2).

Pursuant to California Fish and Game Code Section 2077, DFW conducted a status review for Kenwood Marsh checkerbloom to determine whether the conditions that led to the original listing are still present. FCG received the status review report at its Aug 20, 2020 meeting.

DFW finds there is sufficient scientific information to indicate that the conditions that led to the listing of Kenwood Marsh checkerbloom as endangered are still present. Kenwood Marsh checkerbloom faces ongoing threats, has an exceptionally limited range, and its overall status has remained largely unchanged since listing. DFW recommends retaining the status of this species as endangered (Exhibits 1 and 2).

Due to an error found in the five-year status review "Management and Recovery" section, DFW transmitted to FGC an erratum and corrected five-year status review on Sep 17, 2020 (Exhibit 2). The correction does not change DFW's recommendation.

Significant Public Comments (N/A)

Recommendation

FGC staff: Retain endangered species status for Kenwood Marsh checkerbloom as recommended by DFW.

DFW: Retain endangered species status for Kenwood Marsh checkerbloom.

Exhibits

1. DFW memo, received Jul 16, 2020
2. Erratum and corrected DFW five-year status review report, received Sep 17, 2020
3. DFW presentation

Motion/Direction (N/A)

18. MOHAVE DESERT TORTOISE

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

Consider and potentially act on the petition, DFW's evaluation report, and comments received, to determine whether changing the listing status of the Mohave desert tortoise (also known as Agassiz's desert tortoise) (*Gopherus agassizii*) from a threatened species to an endangered species under the California Endangered Species Act (CESA) may be warranted.

Summary of Previous/Future Actions

• Received petition	Mar 23, 2020
• Transmitted petition to DFW	Apr 13, 2020
• Published notice of receipt of petition	May 1, 2020
• Received DFW 90-day evaluation report	Aug 19-20, 2020; Webinar/Teleconference
• **Today determine if changing the listing status may be warranted**	**Oct 14, 2020; Webinar/Teleconference**

Background

On Mar 23, 2020, FGC received a petition to change the status of Mohave desert tortoise from a threatened species to an endangered species under CESA (Exhibit 1). Pursuant to Section 2073 of the California Fish and Game Code, FGC referred the petition to DFW for its evaluation on Apr 13, 2020. A notice of receipt of petition was published in the California Regulatory Notice Register on May 1, 2020.

California Fish and Game Code Section 2073.5 requires that DFW evaluate the petition and submit a written evaluation with a recommendation to FGC; the evaluation report (Exhibit 2) was received at FGC's Aug 2020 meeting. The evaluation report delineates each of the categories of information required for a petition, evaluates the sufficiency of the available scientific information for each of the required components, and incorporates additional relevant information that DFW possessed or received during the review period. Based on the information contained in the petition and other relevant information, DFW concludes that there is sufficient information to indicate the petitioned action may be warranted.

At today's meeting, FGC will receive a presentation (Exhibit 3) on DFW's petition evaluation and hold a public hearing to receive oral testimony. Today's hearing takes place more than 30 days after the public release of the evaluation report as required by Fish and Game Code Section 2074. If FGC determines listing may be warranted pursuant to Section 2074.2 of the Fish and Game Code, DFW will undertake a one-year status review before FGC can make a final decision on changing the listing status.

CESA and FGC's regulations require that the petition contain specific scientific information related to the status of the species. CESA, and case law interpreting it, make clear that FGC must accept a petition when the petition contains sufficient information to lead a reasonable person to conclude that there is a substantial possibility the requested listing could occur. Determining whether a requested listing could occur relates to the species' status, that is,

whether the species' continued existence is in serious danger or is threatened by a number of factors, and does not relate to economic consequences that might result from listing.

If FGC determines that the petitioned action may be warranted, the Mohave desert tortoise becomes a candidate for listing as endangered pursuant to Section 2074.2. While candidate species are protected under CESA pursuant to Section 2085, the desert tortoise will remain on the list of threatened species during the remainder of the listing process and will continue to be protected by CESA pursuant to Section 2080.

Significant Public Comments (N/A)

Recommendation

FGC staff: Determine that changing the listing status of Mohave desert tortoise from threatened to endangered may be warranted.

DFW: Accept the petition for further consideration under CESA.

Exhibits

1. CESA petition and cover letter, received Mar 23, 2020
2. DFW transmittal memo and 90-day petition evaluation report, received Jul 23, 2020
3. DFW presentation

Motion/Direction

Moved by _____ and seconded by _____ that the Commission, pursuant to Section 2074.2 of the California Fish and Game Code, finds that the petition to change the status of the Mohave desert tortoise from a threatened to an endangered species under the California Endangered Species Act does provide sufficient information to indicate that the petitioned action **may be warranted** based on the information in the record before the Commission, and directs staff to issue a notice reflecting this finding and indicating that Mohave desert tortoise is a candidate for endangered species status.

OR

Moved by _____ and seconded by _____ that the Commission, pursuant to Section 2074.2 of the California Fish and Game Code, finds that the petition to change the status of the Mohave desert tortoise from a threatened to an endangered species under the California Endangered Species Act **does not provide sufficient information** to indicate that the petitioned action may be warranted based on the information in the record before the Commission.

STAFF SUMMARY FOR OCTOBER 14, 2020

19A. 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 and consider any changes to meeting dates or locations.

Summary of Previous/Future Actions (N/A)

Background

The next FGC meeting is scheduled for Dec 9-10. Because of ongoing health concerns related to COVID-19 and state travel restrictions, this meeting will be held by webinar/teleconference. Staff anticipates that FGC will meet remotely via webinar/teleconference through at least the remainder of the fiscal year (through June 2021).

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

Note that staff is proposing to add to the 2021 calendar another meeting to coincide with the Jan 12 Wildlife Resources Committee meeting; other than general public comment, the single agenda item would be a discussion hearing for the mammal hunting rulemaking requested under Agenda Item 19B for this meeting.

Significant Public Comments (N/A)

Recommendation

FGC staff: Approve potential agenda items for the Dec 9-10 FGC meeting as presented in Exhibit 1 and with any modifications discussed today.

Exhibits

1. Potential agenda items for the Dec 9-10, 2020 meeting

Motion/Direction

Moved by _____ and seconded by _____ that the Commission approves the draft agenda items for the December 9-10, 2020 Commission meeting, as amended today.

19B. RULEMAKING TIMETABLE UPDATES

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

Review and potentially approve changes to the perpetual timetable for anticipated regulatory actions.

Summary of Previous/Future Actions

• FGC approved changes to rulemaking timetable	Aug 19-20, 2020; Webinar/Teleconference
• **Today consider approving changes to the rulemaking timetable**	**Oct 14, 2020; Webinar/Teleconference**

Background

This is a standing agenda item for FGC staff and DFW to request changes to the FGC regulatory timetable, or for FGC to make changes during the course of this meeting.

DFW requests two changes to FGC's regulatory timetable (exhibits 1 and 2):

- Amend sections 360 and 363 and add Section 708.19 related to mammal hunting. The rulemaking is necessary to reinstate elk and pronghorn antelope preference points and partially refund fees paid to hunters who were unable to use their drawn tags in 2020 due to fire-related forest closures in specified areas. The rulemaking will also modify regulatory text associated with season date changes such that annual rulemakings will not be necessary to keep the language current, and will also adjust deer and pronghorn antelope tag quotas in areas where CDFW long-term datasets indicate population declines.

  DFW requests that the proposed rulemaking be scheduled for a notice hearing at the Dec 2020 FGC meeting. In considering the potential discussion and adoption hearing schedule, FGC staff requests that FGC add a meeting on Jan 12, 2020 (to coincide with the WRC meeting) for the discussion hearing so that the proposed regulations can be considered for adoption at the Feb 10-11, 2020 FGC meeting. The proposed schedule will allow the regulations to be effective prior to next year's big game tag drawing.

- Amend Section 632, Marine Protected Areas, Marine Managed Areas, and Special Closures, to allow for maintenance of pre-existing artificial structures within state marine conservation areas. This rulemaking is necessary to allow for permitted maintenance and/or repair needs of artificial structures that were installed prior to marine protected area designation by the Commission.

  DFW requests that the proposed rulemaking be scheduled for a notice hearing at the Feb 2021 FGC meeting, discussion at the Apr 2021 meeting, and adoption at the Jun 2021 meeting. Under Agenda Item 9 for this meeting, staff recommends that the Marine Resources Committee discuss the proposed rulemaking at its Nov 2020 meeting and develop a recommendation for FGC consideration.

Significant Public Comments (N/A)

Recommendation

***FGC staff*:** Adopt proposed changes to the timetable for anticipated regulatory actions (Exhibit 2), including any rulemaking changes identified during today's meeting.

Exhibits

1. DFW memo, received Oct 6, 2020
2. *Perpetual Timetable for Anticipated Regulatory Actions*, dated Oct 6, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission approves the proposed changes to the rulemaking timetable as recommended by staff and as discussed today.

STAFF SUMMARY FOR OCTOBER 14, 2020

19C. 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 14, 2020

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 California Fish and Game Code. FGC will address four 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, at the time the agenda was made public.

In the writ proceeding brought by Aaron Lance Newman, the trial court entered a ruling (Exhibit A1). In the proceeding, Mr. Newman challenged FGC's decision to revoke his hunting and sport fishing privileges. The court has vacated FGC's decision without prejudice due to a perceived procedural problem.

(B) ***Possible litigation involving FGC***

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

(C) ***Staffing***

For details about staffing, see the executive director's report under Agenda Item 3 for today's meeting.

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

I. *Silva appeal*: Consider the appeal filed by Robert Silva in Agency Case No. 20ALJ06-FGC regarding his request to renew his lobster operator permit. On Apr 29, 2020, DFW provided Mr. Silva notice denying his request to reinstate a lobster operator permit (Exhibit D1). On Jun 4, 2020, Mr. Silva filed an appeal with FGC (Exhibit D2). On Oct 2, 2020, DFW submitted a letter to FGC stating that DFW does not oppose granting the appeal (exhibits D3 and D4). Given that DFW submitted a statement indicating it does not oppose the relief requested in the

appeal, the appeal is now uncontested. FGC has delegated to its executive director authority to enter a final order in an uncontested matter.

II. *Perrone appeal*: Consider the appeal filed by Nicholas Perrone in Agency Case No. 20ALJ08-FGC regarding his request to renew his salmon vessel permit. On Aug 10, 2020, DFW provided Mr. Perrone notice denying his request to renew his salmon vessel permit (Exhibit D5). On Aug 25, 2020, FGC received an appeal from Mr. Perrone (Exhibit D6). On Oct 2, 2020, DFW submitted a letter to FGC stating that DFW does not oppose granting the appeal (exhibits D7 and D8). Given that DFW submitted a statement indicating it does not oppose the relief requested in the appeal, the appeal is now uncontested. FGC has delegated to its executive director authority to enter a final order in an uncontested matter.

Significant Public Comments (N/A)

Recommendation

FGC staff: Consider whether to appeal the trial court's decision in Aaron Lance Newman v. California Fish and Game Commission. Take no action on the administrative appeals under agenda items D.I and D.II and rely on FGC's executive director authority to take action on the appeals field by Mr. Silva and Mr. Perrone.

Exhibits

A1. Sacramento County Superior Court Ruling, Case No. 34-2018-80002944
D1. Letter from DFW to Robert Silva, dated Apr 29, 2020
D2. Email from Robert Silva to FGC, dated Jun 4, 2020
D3. Letter from DFW to FGC, dated Oct 2, 2020
D4. Fee Statement from DFW, dated Apr 29, 2020
D5. Letter from DFW to Nicholas Perrone, dated Aug 10, 2020
D6. Letter from Nicholas Perrone to FGC, received Aug 25, 2020
D7. Letter from DFW to FGC, dated Oct 2, 2020
D8. Fee Statement from DFW

Motion/Direction (N/A)

CALIFORNIA FISH AND GAME COMMISSION
RECEIPT LIST FOR PETITIONS FOR REGULATION CHANGE: RECEIVED BY 5:00 PM ON OCTOBER 1, 2020
Revised 10/05/2020

Tracking No.	Date Received	Name of Petitioner	Subject of Request	Short Description	FGC Receipt Scheduled	FGC Action Scheduled
2020-011 AM1	8/12/2020	Andy Schneider	Set precautionary commercial coonstripe shrimp trap fishing regulations	Establish more precautionary coonstripe shrimp commercial trap fishery regulations to: (1) establish limited entry program; (2) set a trap limit (350 traps proposed); and (3) set a minimum trap mesh size of 1.0"-0.5".	10/14/20	12/9/2020
2020-012 AM1	9/1/2020	Harry Rabin	Protect great white shark nursery grounds at Padaro Beach, Carpenteria	Etablish a protected area with boating and fishing restrictions at Padaro Beach, Carpinteria, to protect great white shark nursery grounds.	10/14/20	12/9/2020
2020-013	9/18/2020	Keith Rootsaert	Removal of aquatic invasive species	Allow removal of aquatic invasive species that exist in California waters for scientific research.	10/14/20	12/9/2020
2020-014 AM1	9/19/2020	Nancy Caruso	Recreational and research take of Sargassum Horneri	Authorize increased removal of Sargassum Horneri: (a) Set unlimited recreational take limit from April through October (non-reproductive season); (b) Add take provision in Crysal Cove State Marine Conservation Area (SMCA) consistent with (1) above; and (c) Authorize controlled research removals at Crystal Cove SMCA under FGC authority as designating entity.	10/14/20	12/9/2020

State of California – Fish and Game Commission
PETITION TO THE CALIFORNIA FISH AND GAME COMMISSION FOR REGULATION CHANGE
FGC 1 (Rev 06/19) Page 1 of 2

Tracking Number: (2020-011AM1) -

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, (physical address) 1416 Ninth Street, Suite 1320, Sacramento, CA 95814, (mailing address) P.O. Box 944209, Sacramento, CA 94244-2090 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: Click here to enter text. ANDY SCHNEIDER
   Address: Click here to enter text. [redacted]
   Telephone number: Click here to enter text. [redacted]
   Email address: Click here to enter text. [redacted]

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 713, 1050, 8591 and 8842, California Fish and Game Code
   TITLE 14, 180.15 CCR coonstripe shrimp, also 180.2, 180.5 trap fishery

3. **Overview (Required)** - Summarize the proposed changes to regulations: Click here to enter text. ① Establish limited entry ② Establish trap limit (350 traps - proposed) ③ Establish minimum mesh size (1" x 0.5" - proposed)

4. **Rationale (Required)** - Describe the problem and the reason for the proposed change: Click here to enter text. ① limit participants to reduce potential threat to marine mammals (ESA listed whales) ② Reduce trap count to reverse overcapitalization trend and reduce threat to marine mammals (ESA listed whales) ③ Reduce take and injury of unmarketable juvenile stocks

SECTION II: Optional Information

5. **Date of Petition:** Click here to enter text. Aug 10, 2020

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. ① limited entry ② trap limit ③ min. mesh size
   ☐ 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. Jan 1, 2021

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.
    The fishery is being overcapitalized and will become unsustainable, 2 whales entangled per 7 fishers

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.
    no economic impact. 7 boats fishing will see increased catch per unit of effort

12. **Forms:** If applicable, list any forms to be created, amended or repealed:
    Click here to enter text. trap tag application

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

Date petitioner was notified of receipt of petition and pending action: _____ (Tracking Number)

Meeting date for FGC consideration: _____

FGC action:
- ☐ Denied by FGC
- ☐ Denied - same as petition _____ (Tracking Number)
- ☐ Granted for consideration of regulation change

Tracking Number: _2020-012_

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, (physical address) 1416 Ninth Street, Suite 1320, Sacramento, CA 95814, (mailing address) P.O. Box 944209, Sacramento, CA 94244-2090 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: HARRY RABIN
Address: [redacted]
Telephone number: [redacted]
Email address: [redacted]

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: **Request for MPA expansion**. Added per Mr. Rabin's authorization: 200, 205(c),1590, 2860, 2861, Fish and Game Code; and Sections 36725(a) and 36725(e), Public Resources Code

3. Overview (Required) - Summarize the proposed changes to regulations: Create a protected area for Padaro Beach, Carpinteria, CA white shark nursery.

4. Rationale (Required) - Describe the problem and the reason for the proposed change:

Padaro Beach is a proven habitat for white shark juveniles, YOY. They returned in April of 2014 and they continue to return each year. In August of this year an unprecedented population was documented at over 24 animals. Also new was the amount of injury done to these white sharks by boaters and fishermen. We have pictures and video to back up these claims and can submit the media if requested. We are proposing the following changes regarding boating and fishing which are listed below. In addition we have made educational safety and shark etiquette information available to the general public. Interactions occur daily in this area between the white sharks and prey and also with human activity. So it was essential to create and educational outreach for the public to protect both beach goers and sharks alike.

Boating regulations for this area:
Boaters are chumming to attract white sharks to their boats altering the normal behavior and hunting patterns of these juvenile sharks. Reef Guardians has observed and filmed these sharks approaching and remaining in close proximity to vessels entering the area. We have monitored these sharks since 2014 and this is new behavior.

Any boat entering this area See attached map) should be required to have a propeller guard. We have seen 3 prop strikes on the white sharks and a very serious one on 8/26/2020 where the left pectoral fin was partially severed from underneath and is now bent vertically up against the sharks body. This was a
Documented 7' healthy white shark ID:"Arrow" who spent his 3rd and now last season at this location. We searched for him for 6 days but never found him.

Fishing regulations:
We have also observed several torpedo sinkers and possibly non corrosive hooks on 3 of these sharks. Fishing rules and regs need to be posted and maintained in the area to keep these sharks safe.

SECTION II: Optional Information

5. Date of Petition: Click here to enter text.

6. Category of Proposed Change
X Sport Fishing
☐ Commercial Fishing
☐ Hunting
X Other, please specify: Marine protected area for white shark nursery.

7. The proposal is to: (*To determine section number(s), see current year regulation booklet or https://govt.westlaw.com/calregs*)
COULD NOT FIND SECTIONS THAT APPLY TO MPA.
☐ 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: **APRIL 2021. They arrive mid-April each year and begin departing Nov-Dec of the sane year**

10. Supporting documentation: Identify and attach to the petition any information supporting the proposal including data, reports and other documents:
Boating regulations for this area:
Boaters are chumming to attract white sharks to their boats altering the normal behavior and hunting patterns of these juvenile sharks. Reef Guardians has observed and filmed these sharks approaching and remaining in close proximity to vessels entering the area. We have monitored these sharks since 2014 and this is new behavior.

Any boat entering this area See attached map) should be required to have a propeller guard. We have seen 3 prop strikes on the white sharks and a very serious one on 8/26/2020 where the left pectoral fin was partially severed from underneath and is now bent vertically up against the shark's body. This was a

Documented 7' healthy white shark ID:"Arrow" who spent his 3rd and now last season at this location. We searched for him for 6 days but never found him.

Fishing regulations:
We have also observed several torpedo sinkers and possibly non corrosive hooks on 3 of these sharks. Fishing rules and regulations need to be posted and maintained in the area to keep these sharks safe.

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: Beneficial to CDFW, Tourism, Santa Barbara Department of Aquatics, Health and Safety.

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

Date petitioner was notified of receipt of petition and pending action: _____
Tracking Number

Meeting date for FGC consideration: _____

FGC action:

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

From: Keith Rootsaert [redacted]
Sent: Thursday, September 17, 2020 08:24 PM
To: FGC <FGC@fgc.ca.gov>
Cc: Ashcraft, Susan@FGC <Susan.Ashcraft@fgc.ca.gov>; [redacted]
[redacted] ; [redacted]
Subject: FGC1 - Rootsaert AIS Sept 22 FGC Meeting

Dear Commissioners,

Please find my attached written materials for the September 22, 2020 Fish and Game Commission Meeting. These are herby submitted before the Supplemental Comment Deadline of September 18 at noon. These materials are for my presentation under Agenda Item 2 - General public comment for items not on the agenda.

This submittal also serves as the formal submittal of my FGC1 Petition to the California Fish and Game Commission for Regulation Change.

Thank you,

Keith Rootsaert
G2KR.com
[redacted]

Tracking Number: (2020-013)

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, (physical address) 1416 Ninth Street, Suite 1320, Sacramento, CA 95814, (mailing address) P.O. Box 944209, Sacramento, CA 94244-2090 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: Keith Rootsaert
Address: [redacted]
Telephone number: [redacted]
Email address: [redacted]

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: Section 200 and 205, Fish and Game Code

3. Overview (Required) - Summarize the proposed changes to regulations: Change Fish and Game Code, Chapter 3.5, Section 2300 to allow removal of aquatic invasive species that exist in California waters for bona fide scientific research.

4. Rationale (Required) - Describe the problem and the reason for the proposed change:

On Jan 8, 2008 the California Aquatic Invasive Species Management Plan (AISMP) (with a cover photo of Caulerpa) was signed by Governor Arnold Schwarzenegger. This plan was well developed and had public testimony and discussion and formed a framework for dealing with Aquatic Invasive Species (AIS) in a whole of government approach. However, this plan has languished on the shelf for 12 years.

There have been numerous invasive species outbreaks in California waters including Marine Protected Areas and there has not been any significant State action to manage AIS as described in the AISMP. The effort seems now to be concentrated with the USCG in monitoring ballast water discharges. What is more, concerned citizens have not been permitted to assist with removal. The result is the unchecked wide distribution of the invasive seaweed, *Sargassum horneri*, in southern California that is outcompeting native species.

In Monterey there is an invasive bryozoan, *Watersipora subtoquata* (Ws), that started in the Monterey Harbor and has been spotted as far south as Point Lobos. In the course of our urchin experiment in Pacific Grove Marine Gardens State Marine Conservation Area we discovered that Ws is colonizing on six of our treated reefs with the lowest urchin densities. We have spotted large colonies of Ws being eaten by urchins (See Figure 1 below).

Figure 1 Purple and red urchins eating Watersipora subtorquata west of Lovers Point August 20, 2020. Photo by Vince Christian

In the course of our many searches, we have not found Ws in the most impacted urchin barrens. Our conclusion is that Ws is a preferred food of starving urchins and that the urchins are detrimental to Ws colonization. In the absence of urchins Ws will probably spread more quickly and be found in more places, especially those where urchin removal is taking place.

Petition 2020-001 will hopefully adopted in December 2020 and urchin culling with recreational divers may begin in spring of 2021. However, Ws is a dominant invasive in the Monterey harbor and whole dock pilings are covered from bottom to waterline in these red wavy "potato chips." There is no plan to eradicate Ws because the vector is unknown, there are no reliable means to remove it, the law expressly prohibits removal, and there is no effort by the State to act. The marina borders the Petition 2020-001 restoration project boundary and when urchin density is reduced to historic levels well below $1/m^2$ Ws will very probably colonize the cleared real estate.

Sargassum horneri was spotted on June 4, 2020 by Melanie Moreno at the Monterey breakwater jetty. A couple plants were removed by DFW but it is not known if more of the invasive seaweed is present in the Edward F. Ricketts State Marine Conservation Area or on the other side of the jetty in the inland waterway of the Monterey Municipal Marina. If the vector is boat traffic, there may be more Sargassum horneri at the other 3 harbors in the region. If more is spotted by divers, there needs to be a mechanism for rapid response and removal.

In Chapter 8 of the AISMP there is a case study of a successful eradication effort in San Diego of *Caulerpa taxifolia*. It is an uplifting story of a multi-agency "rapid identification, an expedited response and cooperation among stakeholders, plus adequate funding and follow-up". It is this kind of response that the AISMP was designed to tackle, yet the AISMP was never implemented. Since their introduction, the two very destructive species *Sargassum horneri* and *Watersipora subtoquata* are now very widespread.

In the Appendix of the AISMP, on Page 4, the plan spells out what would happen if the plan is NOT implemented: "If the commitment, expertise and funding fail to coalesce, the state could

be faced with substantial environmental and economic consequences caused by AIS infestations." This is followed by 6 possible negative consequences, all of which have come to fruition.

As a response to the *Caulerpa* invasion and subsequent eradication, the Fish and Game Code, Chapter 3.5, Section 2300 was changed at some point to allow removal of *Caulerpa* in its many varieties. The intent of this petition is to add the invasive species that are presently a menace to this section of the code. This change permits DFW to sanction what it determines to be "bona fide scientific research" on the efficacy of invasive species removal and respond to the present outbreaks of AIS.

This proposed rule change would provide the recreational diver effort afforded Petition 2020-001 the ability to identify and locally eradicate invasive Ws and Sargassum horneri from Tanker's Reef when and where it occurs under the supervision and authority of DFW. It will also allow research on the efficacy of *Sargassum horneri* removal in southern California, supplementing the FGC1 Petition submitted by Nancy Caruso.

SECTION II: Optional Information

5. Date of Petition: 9/17/20

6. Category of Proposed Change

☐ Sport Fishing
☐ Commercial Fishing
☐ Hunting
x Other, please specify: Fish and Game Code

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

x Amend Title 14 Section(s) Fish and Game Code, Chapter 3.5, Section 2300

(a) No person shall sell, possess, import, transport, transfer, release alive in the state, or give away without consideration the salt water algae of the Caulerpa species: taxifolia, cupressoides, mexicana, sertulariodes, floridana, ashmeadii, racemosa, verticillata, and scapelliformis*, nor the salt water algae Sargassum horneri, nor the invasive bryozoan Watersipora subtorquata.*
(b) Notwithstanding subdivision (a), a person may possess, for bona fide scientific research, as determined by the department, upon authorization by the department, the salt water algae of the Caulerpa species: taxifolia, cupressoides, mexicana, sertulariodes, floridana, ashmeadii, racemosa, verticillata, and scapelliformis*, the salt water algae Sargassum horneri, and the invasive bryozoan Watersipora subtorquata.*

☐ 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 x 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: ASAP, these AIS spread very quickly.

10. Supporting documentation: Identify and attach to the petition any information supporting the proposal including data, reports and other documents:

Reference:
AISMP
https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3868&inline=1
AISMP appendix
https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3869&inline=1
Growth and Distribution of the Invasive Bryozoan Watersipora in Monterey Harbor, California
https://nmsmontereybay.blob.core.windows.net/montereybay-prod/media/research/techreports/lonhart_2012.pdf

FGC1 submitted by Nancy Caruso and all references cited therein.

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: Surely it will cost billions if AIS are not managed. This change would allow scientific experiments to be conducted by others with modest cost to CDFW for staff time and administration of research.

12. Forms: If applicable, list any forms to be created, amended or repealed: N/A

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

From: [redacted]
Sent: Friday, September 18, 2020 12:14 AM
To: FGC <FGC@fgc.ca.gov>
Cc: Ashcraft, Susan@FGC <Susan.Ashcraft@fgc.ca.gov>
Subject: FG 1 petition for regulation change

Dear Commissioners,
I am submitting an FG 1 Petition to the California Fish and Game Commission for Regulation Change. Please find the attached FG 1 petition "FG Comm Petition_Nancy Caruso" and all the referenced supporting documents for the September 22, 2020 Fish and Game Commission Meeting. They were sent before the Supplemental Comment Deadline of September 18 at noon.

Commissioners Please Note: Supporting Reference materials for *MBC 2019* report has not yet been distributed to the public but is available online here https://1drv.ms/u/s!AkLZpj2SiR6xpG_MWqq-Hs8Rqsuo?e=ouAaVG
A Powerpoint overview of that report is attached

Sincerely,

Nancy L. Caruso
Marine Biologist/Founder
Get Inspired
[redacted]
www.GetInspiredinc.org

You can Support our Green Abalone Project here www.gofundme.com/abalone

Tracking Number: (2020-014)

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, (physical address) 1416 Ninth Street, Suite 1320, Sacramento, CA 95814, (mailing address) P.O. Box 944209, Sacramento, CA 94244-2090 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: Nancy Caruso, Marine Biologist, Executive Director of Get Inspired
Address: [redacted]
Telephone number: [redacted]
Email address: [redacted]

2. **Rulemaking Authority (Required) -** Reference to the statutory or constitutional authority of the Commission to take the action requested: *Section 200 and 205, Fish and Game Code §632. Marine Protected Areas (MPAs), Marine Managed Areas (MMAs), and Special Closures. "The commission may authorize research, education, and recreational activities, and certain commercial and recreational harvest of marine resources, provided that these uses do not compromise protection of the species of interest, natural community, habitat, or geological features." "The designating entity or managing agency may permit research, education, and recreational activities, and certain commercial and recreational harvest of marine resources PRC §36710(c)."* Added per Nancy Caruso email - 10/4/20: For Section 30 of T14CCR: Section 6750, Fish and Game Code.Section 632 of T14CCR: Sections 200, 205(c), 265, 399, 1590, 1591, 2860, 2861 and 6750, Fish and Game Code; and Sections 36725(a) and 36725(e), Public Resources Code

3. Overview (Required) - Summarize the proposed changes to regulations:

1.Request to modify Section *30.00, Title 14, CCR30.00.*
KELP GENERAL. (a) Except as provided in this section and in Section 30.10 there is no closed season, closed hours or minimum size limit for any species of marine aquatic plant. The daily bag limit on all marine aquatic plants for which the take is authorized, except as provided in Section 28.60, is 10 pounds wet weight in the aggregate. (b) Marine aquatic plants may not be cut or harvested in state marine reserves. Regulations within state marine conservation areas and state marine parks may prohibit cutting or harvesting of marine aquatic plants per sub-section 632(b) [marine protected area regulations].

-Change the recreational take of *Sargassum horneri* from 10 pounds wet weight to "no limit" April through October (during non-reproductive season).

2. Request to modify 14 CCR § 632 Crystal Cove SMCA: Area restrictions defined in subsection 632(a)(1)(C) apply, with the following specified exceptions:
-Allow for unlimited recreational take of *Sargassum horneri* in the Crystal Cove SMCA April through October (during non-reproductive season).

3. *"The commission may authorize research, education , and recreational activities, and certain commercial and recreational harvest of marine resources…"*
-Allow for localized, controlled, year-round removal of Sargassum for 3 years as a research project in Crystal Cove SMCA under direction of Nancy Caruso of Get Inspired to determine if Sargassum is prohibiting kelp recruitment, recovery, and experiment with techniques for eradication.

4.Rationale (Required) - Describe the problem and the reason for the proposed change:
The problem is that *Sargassum horneri* has invaded our coast and is spreading rapidly. It is having a negative impact on our kelp forest ecosystem. DFW has not acted in accordance with the Aquatic Invasive Species Management Plan. Below, we lay out the reasons for the proposed changes to make strides to eradicate it.

1. DFW failed to respond and stop the spread of the invasive species *Sargassum horneri*

Sargassum horneri is native to Eastern Asia. It has spread aggressively throughout southern California, USA, and Baja California, México since it was discovered in Long Beach in 2003 and poses a major threat to the sustainability of native marine ecosystems in this region (Marks et al. 2015). Now it is ubiquitous in the region and had been found at three of the five Channel Islands (Anacapa, Santa Cruz and Santa Barbara) (Marks et al. 2015). Earlier this year, it was documented by divers in Monterey, CA (pers comm, 2020). Kaplanis et al. 2016 reported that the rapid and uncontrolled spread of Sargassum has serious implications for its expansion along the west coast of North America.
"California does not have an official rapid response plan for AIS, does not have a designated funding source for providing a rapid response, and no agency is designated with overall responsibility for AIS management. For this reason, it is unknown whether the necessary elements to conduct a rapid response operation will come together when the need arises. If the commitment, expertise, and funding fail to coalesce, the state could be faced with substantial environmental and economic consequences caused by AIS infestations." (CA AIS Mgmt plan Appendices 2008).
The invasion of *Caulerpa taxifolia* in Southern California, in 2000, was met with swift action and eradication. This species could have easily spread and caused widespread issues in our bays and wetland areas. The Southern California Caulerpa Action Team (SCCAT) was established to quickly and effectively respond to the discovery of this algae in Southern California. Caulerpa was quickly contained and even treated with chlorine, killing the plant and its roots. There was no such effort for Sargassum. Now let us, the divers who love our reefs, remove this invasive species. Hopefully we can make an impact on eradication of this species which is of no benefit to our California coast. I hope it is not too late to stop this invasion, so I ask that you allow the community to help eradicate it in the areas that are important to them: where they dive, spearfish, or swim. By allowing unlimited take of Sargassum, we can make an impact and help our kelp to thrive.

2. *Sargassum horneri* is not a marine resource

"MPAs protect the diversity and abundance of marine life, the habitats they depend on, and the integrity of marine ecosystems.". https://wildlife.ca.gov/conservation/marine/MPAS Sargassum threatens the integrity of our marine ecosystem. Currently, Sargassum is being protected in our MPAs as a "marine resource" and the giant kelp is suffering. In the Crystal Cove SMCA in Orange County, you can take finfish, urchins, and lobsters but you can't take an invasive species. This is illogical and must be

changed. The proposed "season" for recreational take from April-October was meant to disentangle from the argument that it can be spread when reproductive. Sargassum is an annual. In general, it recruits in early Summer, becomes reproductive in November, and dies off in April. By creating this "season" of take, that argument cannot be used, as it has for the last 17 years of Sargassum's spread. You have nothing to lose.

In 2015, Cruz-Trejo et. al. studied Sargassum in Baja, Mexico and found the most significant impact to be severe reduction of the canopy forming species on their study sites. In 1982 Ambrose and Nelson found that *Sargassum muticum* appeared to prevent giant kelp recruitment and removal of the invasive species resulted in a significant increase in giant kelp recruitment. They also found higher densities of giant kelp in removal areas. Shading at a critical time in the giant kelp life cycle is suggested as a possible mechanism for the inhibition of giant kelp recruitment (Ambrose and Nelson 1982).

I have been observing and monitoring the reefs of Orange County for 18 years. The warm water events from 2014-2016 gave us our first look at Macrocystis recovery, after a disruption event, WITH *Sargassum horneri* in its ecosystem. Sargassum is an annual and recruits in early summer, BEFORE giant kelp recruits later in winter months. Sargassum has taken advantage of the Macrocystis winter recruitment cycle. When the warm water and high surf decreased kelp and other native algal densities during the warm water "blob" of 2014-2015 followed by an El Nino in 2016, the Sargassum took advantage of the space on the reef prohibiting kelp from recruiting and recovering from these "disruption" events. This is evident in the MBC Aquatic Sciences *Status of the Kelp 2019* report. This report is released annually on the status of the Southern California kelp beds. It contains aerial surveys of our kelp and even tracks local available nitrate (*nutrient quotient*) for kelp growth. Kelp surveys, from this report, confirm that even though the 2018-2019 years had adequate nutrients and temperatures conducive to kelp recovery and growth, Macrocystis densities did not rebound after the 3 years of warm water. Why? There is no room to recruit on the reefs.

Most herbivores do not prefer Sargassum as a food choice and this has helped lead to its success (Marks et. al 2020). *Sargassum horneri* forms monospecific dense forests that fish cannot even swim through, it also limits light penetration to the reef further inhibiting competitors.

Marks et al 2017 findings suggested that controlling *S. horneri* via removal will be most effective if done over large areas during cool-water years that favor native algae. She goes on to suggest that such efforts should be targeted in places such as novel introduction sites or recently invaded areas of special biological or cultural significance. I think the Crystal Cove SMCA fits this description and this year is the year to do it because a *La Nina* is projected. On the Crystal Cove SMCA reefs, in particular, there has been a shift, since our kelp restoration activities in Orange County in 2002-2010, from a Macrocystis forest with healthy understory of other alga and encrusting organisms to a desolate Sargassum covered reef.

3. Reasons we want to do research in the Crystal Cove SMCA

-It is one of the least restrictive MPAs in the system: Take of lobster, finfish, and urchins is already permitted

-We have an 18-year history working in the kelp forests of Crystal Cove, Newport Beach and Laguna Beach

-We have a team of over 300 volunteer divers to help with the effort

-The annual kelp surveys and nutrient data collected by MBC Aquatic Sciences includes this MPA

-Good beach diving access, good boat diving access (Newport Harbor)

-Sargassum densities currently as high as 13.85 plants/m^2

-Kelp has decreased 98% in 2019

-The "nutrient quotient", calculated by MBC Aquatic Sciences, is calculated from data taken at the Newport Pier just 2 miles away. The next closest location is Oceanside (35 miles away). This will give us valuable insight.
-We have the historical knowledge of where giant kelp used to grow in this SMCA
-All the rocky reefs in Orange County with Sargassum growing on them are located in MPAs.
-DFW's recommended test site (Decision Tree) in San Clemente does not contain Sargassum

We have already asked for an SCP for this research project but because of the "Decision Tree", it was denied with the rationale that "It can be done somewhere else" but the next closest rocky reef outside of our Orange County MPA network has no Sargassum (San Clemente, CA). We argue that the requested project location (Crystal Cove SMCA) is unique in several ways and we lay that argument out below. For project details see attached "Timing on *Sargassum horneri* removal as a technique for eradication"

It is clear that Sargassum is a threat to our current native kelp (Cruz-Trejo et al 2015). We have found it at densities as high as 13.8 plants per meter square in Crystal Cove SMCA which is 100% cover in that same meter square at maturity (per observation). It is also clear that despite favorable ocean conditions for the last 2 years kelp densities have decreased (MBC, 2019). Almost all of Orange Counties rocky reefs are in MPAs. In 2019 Crystal Cove SMCA has lost 98% of its kelp, The Laguna Beach SMR lost 89% in North Laguna and 95% in South Laguna, the South Laguna/ Dana Point SMCA kelp beds totally disappeared (MBC, 2019). I believe this is because of Sargassum. In a time when we are relying on these protected areas to preserve our ecosystems, it is vital that we eliminate this threat and study how we can stop its spread. If we do not act, we are countering the very reasoning and rationale for establishing the MPAs. There is no downside to taking this action. We have hundreds of volunteers ready to help. The knowledge gained by this study can be used to eradicate Sargassum in other areas.

The precedence has already been set for this type of action on the North Coast where divers have been given permission to cull purple urchins in the Pacific Grove Gardens SMCA in an effort to restore our precious kelp beds struggling to survive. In an all-out effort, divers are coming together to figure out how they can help preserve the kelp and save our abalone populations as well as the other species that rely on kelp. We only hope that it is not too late. It is clear we cannot afford to wait any longer with regards to Sargassum. It is in the spirit of the MLPA that these areas be protected from invasive threats to allow our native wildlife to thrive, that was the intention. Please use your authority for adaptive management to allow the public to help with this problem. We can help to "save" our reefs from the takeover of Sargassum.

Nancy Caruso, marine biologist, has led a team of more than 300 volunteer divers working on the reefs of Newport Beach and Laguna Beach for 18 years. Restoring giant kelp, monitoring kelp forest recovery, fishes, algae and invertebrates. We have also outplanted abalone (Caruso, 2018) and we are monitoring abalone density, size, recruitment, and mapping abalone populations. We have partnered with DFW as well. This is our community and our reefs that we spoke out for at meetings to implement the MLPA. With the help of 500 students who grew kelp in their classrooms and 250 volunteer divers, we restored our kelp after being gone for 2 decades and want it protected and preserved. We see degradation of our reef communities by *Sargassum horneri* and we want to help fix it. We will conduct a localized removal experiment to test whether Sargassum is hindering kelp recruitment. We will work on the some of the same reefs where we conducted kelp restoration activities, abalone monitoring and restoration since 2002. This SMCA is a familiar large rocky reef system that offers plenty of expanse for a replicated, controlled studies. All of the rocky reefs in Orange County are in MPAs except for the Wheeler Reef system in San Clemente. Steve Schroeter of UCSB (who is managing the monitoring

program for the reef) stated that they found only two Sargassum plants in their 92 transects in 2019. The Crystal Cove SMCA used to be a lush garden of algae and a healthy kelp forest where Wheeler North conducted many kelp restoration experiments. We have data going back to the 1980's from Joe Valensic and we collected data on these reefs from 2002-2012. As concerned scientists, we see a problem, we think we may have the answer, and we want to test it. We can add to the available science through a controlled research approach and then share this information with you, for better management practices and to manage our kelp forests like the important resources that they are.

SECTION II: Optional Information

5. Date of Petition: **9/18/2020**.

6. Category of Proposed Change

X 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*)

X Amend Title 14 Section(s): 30.00

(a) Except as provided in this section and in Section 30.10 there is no closed season, closed hours or minimum size limit for any species of marine aquatic plant. The daily bag limit on all marine aquatic plants, except as provided in 30.00 (c), for which the take is authorized, except as provided in Section 28.60, is 10 pounds wet weight in the aggregate.

(b) Marine aquatic plants, except as provided in 30.00 (c), may not be cut or harvested in state marine reserves. Regulations within state marine conservation areas and state marine parks may prohibit cutting or harvesting of marine aquatic plants, except as provided in 30.00 (c), per sub-section 632(b)
(c)Title 14 CCR § 632 Crystal Cove State Marine Conservation Area.

(B) Area restrictions defined in subsection 632(a)(1)(C) apply, with the following specified exceptions:
1. The recreational take of finfish [subsection 632(a)(2)] by hook and line or by spearfishing [Section 1.76], and spiny lobster and sea urchin is allowed.
2. The commercial take of sea urchin; spiny lobster by trap; and costal pelagic species [Section 1.39] by round haul net [Section 8750, Fish and Game Code], brail gear [Section 53.01(a)], and light boat [Section 53.01(k)] is allowed. Not more than five percent by weight of any commercial coastal pelagic species catch landed or possessed shall be other incidentally taken species.
3. Take pursuant to activities authorized under subsection 632(b)(133)(C) is allowed.
(C) Beach nourishment and other sediment management activities, and operation and maintenance of artificial structures inside the conservation area is allowed pursuant to any required federal, state and local permits, or as otherwise authorized by the department.
(D) Take of all living marine resources from inside tidepools is prohibited. For purposes of this section, tidepools are defined as the area encompassing the rocky pools that are filled with seawater due to retracting tides between the mean higher high tide line and the mean lower low tide line.

X Add New Title 14 Section(s):
Subsection 30
(c) Invasive marine aquatic plant *Sargassum horneri* may be removed without a daily bag limit when the plants are not reproductive (April-October).

CCR § 632
(E) Unlimited recreational take of *Sargassum horneri* by hand during the months of April-October.

☐ 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 X 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: We request that this petition be approved immediately. We hope to take advantage of the forecasted La Nina conditions by starting the project now.

10. Supporting documentation: Identify and attach to the petition any information supporting the proposal including data, reports and other documents: (Attached)
(Identified)
-ResearchProposal: *Timing of Saragssum horneri as a Removal Technique for Eradication*
-Cruz-Trejo et al 2015 Presence of Sargassum horneri at Todos Santos Bay, Baja California, Mexico: Its Effects on the Local Macroalgae CommunityAmerican Journal of Plant Sciences, 2015, 6, 2693-2707 Published Online October 2015 in SciRes.
-Aquatic Invasive Species Management Plan and Appendices DFW 2008
-Caruso**,** Nancy L. (2017). Outplanting large adult green abalone (*Haliotis fulgens*) as a strategy for population restoration. California Fish and Game 103(4): 183-194
-Kaplanis NJ, et al (2016) Distribution patterns of the non-native seaweeds Sargassum horneri (Turner) C. Agardh and Undaria pinnatifida (Harvey) Suringar on the San Diego and Pacific coast of North America. Aquatic Invasions 11: 111–124,
-Marks, L.M. et al. 2015. Range expansion of a non-native, invasive macroalga *Sargassum horneri* (Turner) C. Agardh, 1820 in the eastern Pacific. BioInvasions Records 4(4)243-248.
-Marks LM, et al 2017. Assessment of control methods for the invasive seaweed *Sargassum horneri* in California, USA. Manag Biol Invasion.;8(2): 205–213. 10.3391/mbi.2017.8.2.08
-Marks, L.M. 2020. Niche Complementarity and Resistance to Grazing Promote the Invasion Success of *Sargassum horneri* in North America. *Diversity* **2020**, *12*, 54.
-MBC Aquatic Sciences 2020. *2019 Status of the Kelp Beds Orange and San Diego Counties Prepared for the Region Nine Kelp Survey Consortium.* https://1drv.ms/u/s!AkLZpj2SiR6xpG_MWqq-Hs8Rqsuo?e=ouAaVG

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: Increase in revenues to the California Department of Fish and Wildlife for fishing licenses that are required for removal activities. There are no additional costs predicted to the state of local agencies.

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

n/a

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

Date petitioner was notified of receipt of petition and pending action: _____ Tracking Number

Meeting date for FGC consideration: _____

FGC action:

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

APPENDICES

CALIFORNIA
AQUATIC INVASIVE SPECIES
MANAGEMENT PLAN

January 2008

Appendices

APPENDIX A:
DRAFT
AUGUST 2007

RAPID RESPONSE PLAN
FOR AQUATIC INVASIVE SPECIES IN CALIFORNIA

Prepared by:

California Department of Fish & Game
Habitat Conservation Branch
The Invasive Species Program

RAPID RESPONSE PLAN
FOR AQUATIC INVASIVE SPECIES IN CALIFORNIA
TABLE OF CONTENTS

I. INTRODUCTION

Goal: The purpose of this plan is to provide a framework for an effective rapid response to the discovery of any aquatic invasive species (AIS) that is new to California, or of a population of established AIS that is outside of its known distribution in California.

In this document, "rapid response" means that soon after an aquatic species new to the State of California or a specific region of the state is discovered, 1) the state will make a determination of whether it is potentially detrimental and/or invasive and 2) if that is the case, the state will develop and implement a course of action. This also would apply to AIS that are discovered in an adjacent state in a waterway or lake that ultimately enters California.

Possible courses of action for newly discovered AIS may include an effort to eradicate the species, control its spread, prevent future introductions, minimize or mitigate the damage it causes, or study it further before any other action is taken. Rapid response is the second line of defense after prevention to minimize the negative impacts of AIS on the environment and economy of California. Once non-native invasive species become widespread, efforts to control them are typically more expensive and less successful than rapid response measures. The damage caused by an AIS that becomes widespread, and the actions that are taken to control it, may be more harmful to the environment than a successful rapid response.

California does not have an official rapid response plan for AIS, does not have a designated funding source for providing a rapid response, and no agency is designated with overall responsibility for AIS management. For this reason, it is unknown whether the necessary elements to conduct a rapid response operation will come together when the need arises. If the commitment, expertise and funding fail to coalesce, the state could be faced with substantial environmental and economic consequences caused by AIS infestations. Even if an ad hoc rapid response effort is made, the following consequences may result:

1. The effort may be compromised by less than adequate staff levels, authority and funding to carry out necessary actions.

2. Staff assigned on an ad hoc basis are less likely to have received training in advance that would help them function as effectively and efficiently as possible in this situation (e.g. Incident Command System training).

3. The effort may be compromised indirectly by staff in charge of the ad hoc effort spending their time trying to secure staff and funding for the response instead of leading the response itself.

4. The effort may not have the level of organization and accountability to be gained from following an official plan.

5. Some governmental and non-governmental entities may be less cooperative with an ad-hoc response than they would be if the response is a standard procedure that is based on official agency agreements.

6. Any resulting confusion could lead to a perception that public funds are mismanaged, that environmental regulations are not being followed, or that the interests of community leaders have been disregarded.

To address the threat posed to California habitats by new AIS introductions, and the lack of an organized plan and funding to address this threat, Chapter 6 (Task 4A1) of the California Aquatic Invasive Species Management Plan (CAISMP) calls for the development and implementation of a rapid response plan. The CAISMP was completed by the California Department of Fish and Game (DFG) in 2007. The CAISMP acknowledges that rapid response

to AIS in California may often require cooperation among a variety of local, state and federal agencies and organizations, and that formal agreement on a plan, in advance of need, increases the likelihood of responding in an effective manner.

This draft Rapid Response Plan will be available for review by agencies and organizations that are likely to have an interest in rapid response. DFG's Invasive Species Program will revise the plan based on the comments received. The goal is to arrive at a plan that can be the basis for agreements to cooperate on rapid response to AIS. In order to finalize, fund and implement the plan, it is hoped that cooperating agencies will assign staff to participate. DFG Invasive Species Program staff will provide coordination for the interagency activities called for in the agreement(s).

Please note that the procedure section of this plan (Section III) is followed by the planning section (Section IV). The order of these sections is deliberate and meant to emphasize that the objective is to have a working product. Both the procedure and planning sections of this document discuss the need to collect data to evaluate the feasibility and success of the plan. This rapid response plan is meant to fit into an adaptive management strategy where evaluation can lead to improved procedures.

It is not possible to plan proactively for every species that might become a nuisance in state waters, hence the need for this generic plan. It stands to reason, however, that a generic plan cannot be implemented as efficiently as a species- or location-specific plan. Therefore, rapid response plans for individual species or related groups of species at high risk of being introduced and becoming destructive should be formulated. This step is called for in Action 4A3 of the CAISMP.

To effectively protect state aquatic habitats from the impacts of AIS, California needs to develop and implement a comprehensive AIS early detection and reporting plan. This document does not attempt to address the issue of early detection, nor provide a detailed discussion of mechanisms for reporting AIS. It focuses on what happens after detection of a suspect AIS. Since some early detection and reporting of AIS already occurs, a rapid response procedure is considered the most immediate need.

II. LEGAL AUTHORITY FOR RAPID RESPONSE

Appendices B and C in the CAISMP provide general information on the federal and state government agencies and regulations involved in the management of AIS. Rapid response activities could potentially require state and/or federal permits, consultations or agreements related to the placement of fill or structures into state and/or federal waters, protection of state or federally listed species, or the protection of other special status plant or animal species. The normal timeline for obtaining permits issued under these laws may critically delay rapid response efforts. A streamlined regulatory permitting process for implementing the Rapid Response Plan will need to be developed and approved by participating agencies. Additionally, permission is necessary to work on private and public properties. Clear protocols need to be developed to avoid misunderstandings or illegal trespassing, while making the process of obtaining access as efficient as possible.

In addition to the laws relevant to AIS discussed in the CAISMP, there are laws that specifically address taking action during an emergency or under special circumstances. These laws can facilitate the implementation of a rapid response procedure. Examples include:

Creation of Emergency Regulations

Under California Government Code Section 11346.1, rulemaking state agencies, departments, commissions, offices and boards can adopt emergency regulations, which can remain in effect for up to 120 days. These are regulations that must take effect immediately for "preservation of the public peace, health and safety or general welfare" and must meet other requirements of that code section. The process for adoption of emergency regulations can be found at the Office of Administrative Law's web site (www.oal.ca.gov/emer_reg.htm).

The California Department of Food and Agriculture (DFA) has specific statutory authority to establish quarantines to protect the state's agricultural industry from pests (Food and Agriculture Code Section 5301). If an AIS is discovered that has the potential to severely damage crops, water delivery, or flood control systems that support agriculture, DFA can invoke their authority to establish a quarantine area.

According to Section 660 of the Harbor and Navigation Code, any entity, local or state, authorized by law to adopt rules or regulations that govern matters relating to boats or vessels may adopt emergency measures within their jurisdiction as long as they are not in conflict with the general laws of the state relating to those matters. The emergency rules or regulations can be effective for up to 60 days and must be submitted to the Department of Boating and Waterways (DBW) on or before their adoption. DBW can authorize these emergency rules or regulations to be in effect for over 60 days if it is deemed necessary.

Use of a Pesticide Outside of its Registered Use

When dealing with species that are new to California, the technical experts participating in a rapid response incident may determine that the best solution is to use a pesticide outside of its registered use or to deploy a new end use product. Section 18 of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) allows states to apply to use a pesticide for an unregistered use for a limited amount of time if the EPA determines that emergency conditions exist (http://www.epa.gov/opprd001/section18). Under Section 6206 of Title 3 of the California Code of Regulations (CCR), the DFA Director is permitted to apply for a Section 18 exemption when emergency conditions exist. Section 24 of FIFRA authorizes states to register an additional use of a federally registered pesticide or a new end use product to meet a special local need (www.epa.gov/opprd001/24c).

Experimental Unregistered Use of a Pesticide

Section 6260 of Title 3 of the CCR provides the conditions for obtaining a Research Authorization for the experimental use of a pesticide outside of its registered uses. Research Authorizations are administered by the California Department of Pesticide Regulation (DPR).

III. RAPID RESPONSE PROCEDURE

The initial steps in this procedure result in the determination of whether an active response is immediately necessary after a potential invasive species is reported. If immediate action is necessary, and requires more than simple, highly localized measures, resource management staff may decide to implement an incident command system (ICS) response. A set of criteria will be developed to help in this decision making process. Many of the steps listed below are likely to take place simultaneously or overlap to some degree. Examples of these include outreach, rapid assessment, and containment activities. A flow chart showing the general steps of this rapid response procedure is provided as Chart 1.

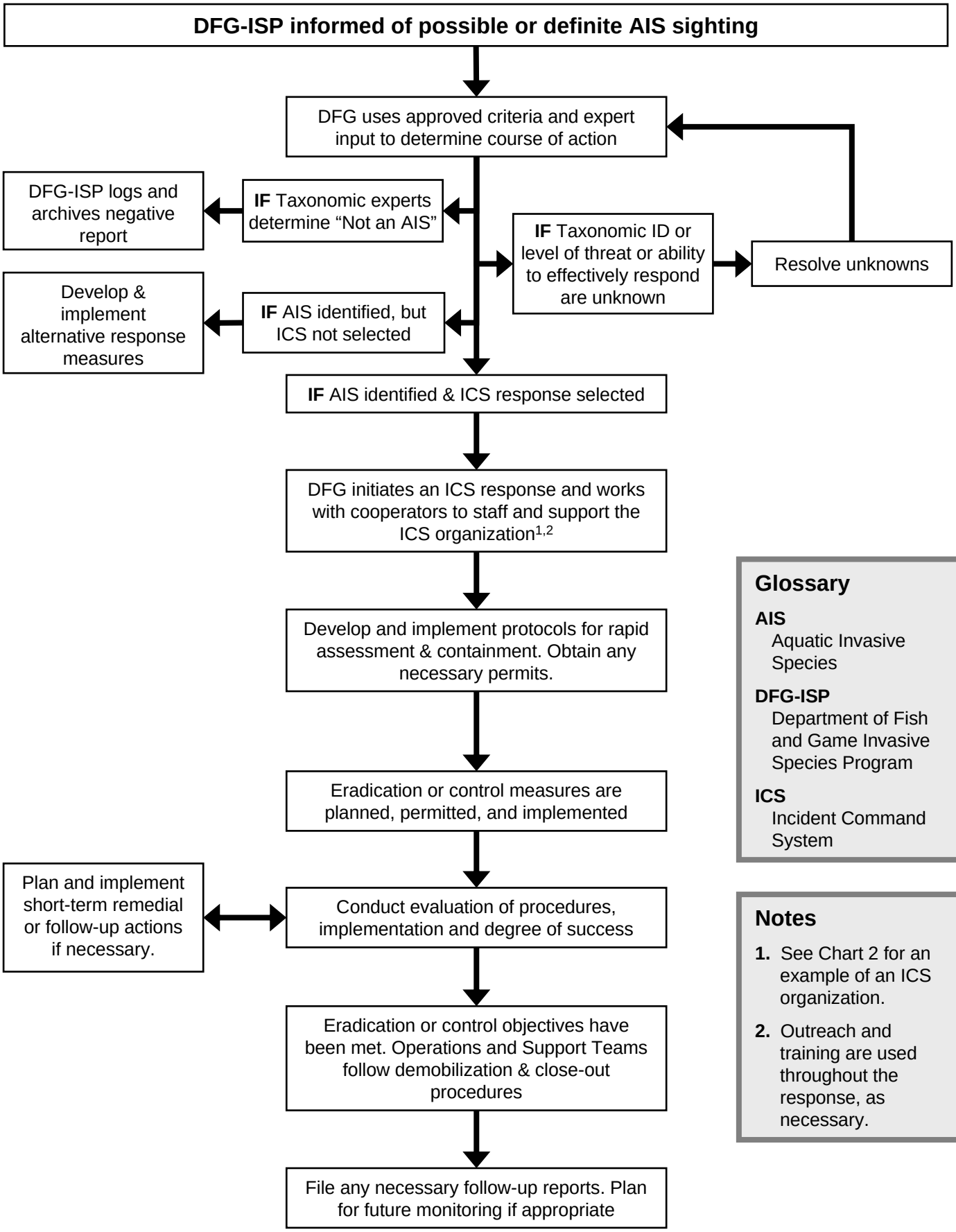
In an ICS response, participants are assigned specific roles in a well-defined hierarchical system that can be expanded or collapsed based on the size and complexity of the incident. The ICS was developed to allow staff from different government agencies and organizations to work

effectively and efficiently together to respond to a natural disaster. Participants essentially check their individual agency identities at the door and participate as members of the ICS organization, dedicated to responding to a particular incident. The system's success relies on participants understanding their role, a clear chain of command and communication, managers having an appropriate span of control, and a standardized process for identifying and communicating objectives, strategies, tasks and deadlines. Because of its proven effectiveness, the ICS has recently been integrated into the National Incident Management System (NIMS). For more information about the principles and features of the ICS go to Lessons 2 and 3 at http://emilms.fema.gov/ICS100G/index.htm. To learn more about the integration of ICS into NIMS, please visit www.fema.gov/emergency/nims. An example of how the ICS staff organization scheme has been applied to an AIS rapid response in California is provided in Chart 2.

Optimal use of this system requires that participants be trained in advance per Section IV (Planning) of this document. The Planning Section also discusses the need to develop the finer details of the procedure, the lists and directories that are referred to in the procedure, and the designation of alternates. This last item ensures that none of the positions described in the procedure are ever vacant.

The procedure that will be followed for a given incident may follow the generic plan provided below or be based on a species-specific rapid response plan approved by the participating agencies. As species-specific plans are developed and approved, staff that have been identified as potential responders will be notified of their approval and location on the Internet. Basic information about each species specific plan will be incorporated into AIS rapid response training.

Chart 1. DRAFT General Procedure for Rapid Response Following Detection of New Aquatic Invasive Species Infestation



Glossary

AIS
Aquatic Invasive Species

DFG-ISP
Department of Fish and Game Invasive Species Program

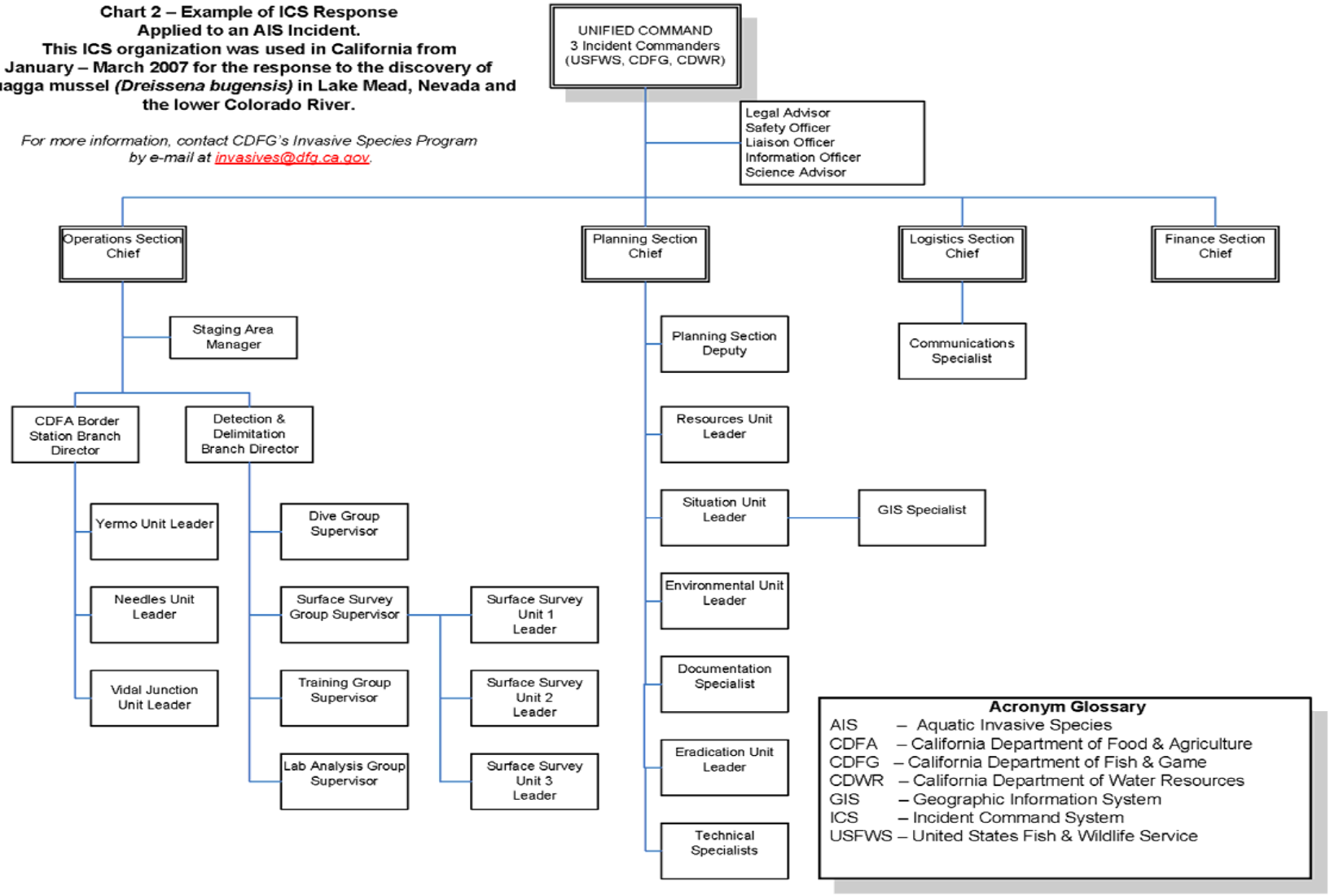
ICS
Incident Command System

Notes

1. See Chart 2 for an example of an ICS organization.
2. Outreach and training are used throughout the response, as necessary.

Chart 2 – Example of ICS Response Applied to an AIS Incident.
This ICS organization was used in California from January – March 2007 for the response to the discovery of quagga mussel *(Dreissena bugensis)* in Lake Mead, Nevada and the lower Colorado River.

For more information, contact CDFG's Invasive Species Program by e-mail at invasives@dfg.ca.gov.



17-STEP RAPID RESPONSE PROCEDURE

Step 1. Identify species and notify authorities

a. Sighting Report: There are three ways in which DFG is likely to receive a report of an AIS sighting.

   1. Either a sighting is reported to DFG via a hotline phone number or e-mail address (Invasives@dfg.ca.gov), and catalogued on *RR Form 1: Suspect AIS Sighting Report* (see Section V).

   2. Staff from another agency or cooperator discovers the AIS and submits the collected information directly to DFG's Invasive Species Program staff.

   3. The initial report is made to one of the federal invasive species reporting systems (e.g. "United States Geological Survey Nonindigenous Aquatic Species Alert System" or the "100th Meridian Initiative") which in turn will alert DFG.

b. Sighting Transmittal: This initial information is transmitted to the DFG Invasive Species Coordinator (ISC). If there is uncertainty about the identification of the species, the Invasive Species Program staff will work with taxonomic experts to resolve the issue.

c. For the purpose of documentation, and to assist making a determination of how to proceed following the initial report, the more detailed *RR Form 2: AIS Alert Report* (see Section V) should be completed.

d. Negative ID: If the identification is negative for AIS no further action is necessary.

e. Indefinite ID and/or level of threat: If uncertainty remains after initial fact-finding, the DFG Invasive Species staff should continue to work with experts from cooperating agencies and research institutions to determine the status of the species reported and the level of threat.

f. Positive ID with a high level of threat: If the discovered organism is invasive and in the presence of vectors that could cause its spread to uninfested areas, DFG Invasive Species Coordinator will consult with DFG executive level staff to determine if an ICS response is appropriate.

   1. If the identification is positive, the DFG Invasive Species staff will ensure that a report is sent to the United States Geological Survey Nonindigenous Aquatic Species Alert System (http://nas.er.usgs.gov/SightingReport.asp). During the response, the alert system should receive updates on any additional locations of the AIS that are found.

   2. Fill out an Incident Brief Form (ICS Form 201).

   3. ICS forms are available at: http://training.fema.gov/EMIWeb/IS/ICSResource/ICSResCntr_Forms.htm

Step 2. Activate command-level participants

a. Incident Command Staff: The executive level DFG staff will work with the Invasive Species Coordinator and executive level staff of cooperating agencies to identify the Incident Command staff. They can utilize the Rapid Response Personnel Directory discussed in the Planning Section of this document.

1. The Incident Commander is the overall supervisor and coordinator for the incident. A detailed description of the responsibilities of an Incident Commander and the other Incident Command officers and General Staff positions, can be found in Lessons 3 and 4 at http://emilms.fema.gov/ICS100G/index.htm.

2. Executive level staff and the ISC will decide to pursue a single command response, with one Incident Commander, or a unified command response, with multiple Incident Commanders working as a team. A Unified Command approach is designed to be used in multi-agency or multi-jurisdiction responses.

b. Initial Unified Command Meeting: If a unified command approach is used the Incident Commanders in the Unified Command should meet to discuss and concur on important issues prior to starting the first operational period planning meetings.

Step 3. Implement the ICS Planning Cycle

a. Begin to utilize the ICS planning cycle to document the current status of the response, identify objectives, strategies, specific task assignments and operational period. See http://www.uscg.mil/hq/g-m/mor/media/Chapter_3.pdf for a description of the ICS Planning Cycle.

1. During every ICS planning cycle, an Incident Action Plan is developed for the following operational period. It contains objectives, safety measures, staff contact information, status of the incident and assignments for each organizational element that will be active during the next operational period. The plan must be approved by the Incident Commander(s).

a) The plan is comprised of standard ICS forms that are available in electronic form. Once the initial set of forms is completed, the Incident Action Plan can rapidly be revised and updated.

Step 4. Develop the Organization

a. Command Post: Establish a command post capable of supporting the space, logistic, communication and other technology needs for managing the operation. It may or may not be a high priority to have the command post located close to the infested site, based on the characteristics of a particular incident. Potential command posts will be listed in the AIS Rapid Response Resource Directory discussed in the Planning Section of this document.

b. Logistics and Finance: The Logistic and Finance Section Chiefs will establish the fundamental tools and means to run the organization, such as setting up the check-in routine, necessary ICS forms, communication services, spending authorizations, and tracking of resources.

c. Assemble Organizational Elements: Using the ICS system, develop an organization that is suitable for the size and complexity of the incident.

1. Directory of Approved Staff: To staff the organizational elements (e.g. sections, branches, units) the Incident Command and upper level General Staff will utilize (but are not limited to) staff directories of people approved to be assigned to rapid response efforts.

2. ICS training materials suggest that “it is better to initially overestimate the need for a larger organization than to underestimate it, as it is always possible to downsize the organization.” (National Wildfire Coordinating Group, 1994, p.3-19).

3. Logistics Section staff will utilize the Resource Directory discussed in the Planning Section of this document in their effort to procure the necessary equipment and supplies among cooperating agencies and organizations during a rapid response procedure.

d. Consider the need to assemble a science advisory panel that may include experts outside of the ICS organization to provide input on such topics as AIS biology, sampling techniques, eradication or control measures.

Step 5. Safety Plan

a. The standard ICS organization includes a Safety Officer who reports to the Incident Commander/Unified Command. One of the duties of the Safety Officer is to develop a Safety and Health Plan that assesses potentially hazardous situations that could exist throughout the operation for responders and the public, and outlines the safety measures that should be taken.

Step 6. Outreach

a. Outreach Plan: The incident's Information Officer develops an Outreach Plan for the incident that addresses short and long-term proactive communication objectives and strategies to be employed with relevant groups such as the media, government agency representatives outside of the ICS response, stakeholders, interest and community groups and the general public.

   1. Develop policy with the Incident Commander(s) and the Liaison Officer regarding protocols for disseminating information.

   2. Besides disseminating information the outreach plan should address obtaining input from stakeholder groups and other interested individuals.

b. The Media: Typically, the Information Officer is assigned to be the contact person for inquiries from the media.

   1. Typical tasks include preparation of press releases, briefings, public meetings, etc.

   2. The Information Officer reports to the Incident Commander.

c. Government Agencies: Typically, a Liaison Officer is assigned to be the point of contact for inquiries from government agencies that have an interest in the response.

   1. The Liaison Officer provides relevant updates on the response to representatives from these agencies.

   2. The Liaison Officer reports to the Incident Commander.

d. Stakeholder and Interest Groups: Outreach to these groups can be crucial, especially if their activities can result in spread of the AIS. Outreach to non-governmental groups needs to be assigned to the Information Officer or the Liaison Officer. A large stakeholder group for a large incident may warrant their own Assistant Liaison Officer or Assistant Information Officer to maximize cooperation from this group and be aware of concerns they may have.

e. General Public: Assign who will be responsible for responding to inquiries from individual members of the public. Determine whether it is advisable to establish and publicize a toll-free call-in number for the incident.

Step 7. Training

a. Develop a Training Plan: There is often a need to establish a training branch within the ICS. As the incident begins to unfold, the Training Director will be responsible for working with managerial level staff to assess and find appropriate means to provide the types of training that are needed, both for staff within the ICS and for cooperating agencies, organizations and volunteers.

   1. A training manual should be developed that contains any specialized protocols and associated training materials (e.g. survey or decontamination protocols).

Step 8. Regulatory Compliance

a. The Planning Section is typically responsible for addressing regulatory compliance with environmental laws, with input from the Legal Specialist assigned to the incident. The issues that are most likely to arise are related to water quality and effects on state or federally listed species during survey or control activities.

Step 9. Containment Actions

a. Take action to prevent the spread of the AIS. Examples of containment actions that might be taken include:

   1. Inspections: Working with public and private managers of infested and potentially infested waterbodies and waterways, locate and inspect potentially contaminated facilities, shorelines, boats, vehicles and equipment to the extent possible. Prioritize a list of potential sites that should be inspected. Some of this work is part of the rapid assessment described below.

      a) Survey boaters about previous and subsequent waterways visited and provide them with information about the AIS problem.

      b) If regulations allow, require, or otherwise, request that aquatic plant and animal material be removed from the watercraft, motor and trailer and for any remaining water to be drained.

      c) Request that boats and equipment be rinsed with high pressure or hot water and dried before launching. The time needed for drying is species specific.

      d) Boats that are found to be contaminated with a legally restricted species per F&G Code Sec. 671 cannot be launched until they are certified by DFG to be decontaminated.

b. Introductions from Out-of-State: Coordinate with California Department of Food and Agriculture's Border Protection Station Program, federal, and other state and national agencies if the introduction is known to have come from out of state or has potential to have come from out of state.

c. Prevent Spread from California: Coordinate with federal and state agencies on preventing spread from California into other states (especially states that border CA), Canada or Mexico.

d. Temporarily quarantine body(ies) of water that contain subject AIS.
   1. Establish a quarantine utilizing one of the methods discussed in legal authority section.
   2. In addition to sites known to contain the subject AIS, consider whether it is appropriate to quarantine areas where the AIS may have been introduced.

Step 10. Rapid Assessment

a. Extent of the Infestation: Get a qualitative "snapshot" of the extent of the infestation and identify potential vectors for spreading the AIS.

   1. Planning and Operations Section staff can work together to identify short vs. longer-term information needs and plan how various types of information should be gathered.

      a) Samples may need to be collected for gathering basic demographic information or more in-depth taxonomic work. Establish protocol for collecting, transporting, and storing samples. Develop appropriate permits for possession and transportation of specimens.

      b) In addition to noting the presence or absence of the AIS, consider whether it's appropriate to systematically get some basic information about the habitat at this point, collect samples of substrate or water, etc.

      c) Determine whether there are known occurrences of, or potential habitat for, state or federally listed species in the area that needs to be surveyed, and whether surveys may require consultation with DFG, the U.S. Fish and Wildlife Service or NOAA Fisheries.

b. Data collection is typically done by the Operations Section of the ICS, with the Logistics and Finance Sections providing assistance with the procurement of equipment, vehicles, travel, etc.

c. Impacted Parties: Obtain contact information for pertinent landowners, land managers, holders of water rights, water users and jurisdiction over the body(ies) of water involved. If it is necessary to enter private property to conduct rapid response work, assign an ICS member to obtain permission to enter.

Step 11. Plan Eradication or Control Measures

a. If appropriate, develop a plan to eradicate the AIS from CA or a control plan to prevent the spread of the AIS. It may not be feasible to finalize the plan during the rapid or ICS phase of the response. Some planning may occur after the ICS is demobilized.

   1. During the assessment phase of the response, the Planning Section can gather and review information on potential eradication or control techniques and confer with experts (Step 4D).

   2. As information is gained from the rapid assessment, and possibly from subsequent detailed sampling, a more refined version of an eradication or control plan can be prepared, discussing the specific measurable objectives, locations and methods for eradication or control, methods for evaluating the effectiveness of the plan, and the potential costs, benefits and impacts.

   3. Conduct any regulatory processes and obtain any regulatory permits that may be necessary prior to implementation of the plan.

Step 12. Implement the Eradication or Control Plan

a. Implementation of the eradication or control plan may place during the "rapid" part of a response; however, if this is not the case, eradication or control measures might be implemented during a later "post –ICS" phase of the response.

b. Document implementation of the eradication or control plan. Note any deviations from the plan and why those occurred.

Step 13. Prevent Reinfestation

a. Develop specific recommendations for actions that can be recommended to prevent reinfestation such as:

    1. Long-term monitoring
    2. Continued outreach and education
    3. Partnerships with business and interest groups
    4. Strengthening relevant regulations
    5. Identify staffing needs
    6. Identify research needs

b. Ensure the potential for introduction from nearby commercial operations (shipping, bait shops, aquaculture, aquarium shops) is removed or minimized to the extent possible.

Step 14. Prepare Demobilization Plan

a. During the response, the Planning Section is responsible for preparation of a Demobilization Plan and having it approved by the Incident Commander(s). The purpose of the Demobilization Plan is to assure that all participants understand their role in an orderly, safe and efficient demobilization of incident resources as rapid response procedures are completed. Equipment and supplies must be returned to appropriate locations, time and cost accounting reports must be completed within required timeframes, and any other required progress and final reports must be prepared and submitted.

Step 15. Monitor the outcome of the Rapid Response

a. Evaluate Eradication or Control Efficacy: If eradication or control actions were taken during the response, monitor and evaluate the efficacy of the treatment(s) used and conduct environmental monitoring that may be necessary to meet regulatory compliance requirements. Prepare a monitoring report and submit a copy to the ISC. If the control or eradication measures require months or years to implement, these evaluation reports may take the form of periodic progress reports.

    1. If the treatments were not successful or an acceptable level of progress is not being achieved, evaluate the potential for remedial measures to improve the results. If there is a strong possibility for improvement, propose possible remedial actions as part of the monitoring report.

b. If eradication or control measures were not taken, there may be a decision to conduct monitoring of the AIS population and provide monitoring reports to the DFG Invasive Species Program.

Step 16. Undertake remedial actions and long-term follow up

a. Remedial Action Approval: If there is efficacy monitoring prior to the demobilization of the incident and remedial actions are recommended, the Incident Commander(s) can approve the implementation of a remedial action plan and utilize the assembled rapid response personnel, assuming any environmental regulatory and/or fiscal issues are addressed.

b. Remedial Action Monitoring: Remedial actions and their results will require subsequent monitoring.

c. Follow-Up Actions: If longer-term actions are necessary, the Planning Section, with input from other rapid response personnel and outside expert input as necessary, will develop a follow-up plan that will be submitted to the DFG Invasive Species Program.

Step 17. Implement the Demobilization Plan

a. Implement the demobilization plan described in Step 14. The work will be carried out by the Incident Teams and Specialists with oversight and coordination from the Incident Command Staff. Reports will be submitted to the ISC for approval and appropriate distribution.

IV. PLANNING FOR RAPID RESPONSE

This section suggests 11 basic task areas necessary to plan for rapid response and completion of this plan.

Task 1. Collaborate to complete plan

Representatives from public agencies and other organizations that are currently involved in rapid response work, or likely to be involved in the foreseeable future, should collaborate to finalize the Rapid Response Plan (see Task 4). The goal is to have a plan that can be the basis for interagency agreements (Task 2). Note that not every item in Task 4 needs to be complete in order to have a plan that supports such agreements. This group could also prioritize and carry out parts of additional planning tasks listed below. The collaboration necessary to carry out the tasks in this section could occur through a technical advisory panel to the CAAIST or AISWG (collaborative groups described in the CAISMP), through the California Biodiversity Council (CBC) Rapid Response Working Group, or through executive or upper management staff of cooperating agencies assigning staff to an interagency Rapid Response Planning Team.

Task 2. Enter into cooperative agreements

DFG Invasive Species Program staff will work with cooperating agencies and organizations to produce a list of entities that should be invited to sign Memoranda of Understanding, Implementation Agreements or similar instruments to cooperate on rapid response to AIS. Existing information in the CAISMP and information collected by CBC Rapid Response Working Group will be used, among other sources, to generate this list. The proposed list and a conceptual outline for these agreements will be presented to CBC and/or directly to relevant agency executives.

Task 3. Secure funding

This Plan cannot be implemented without adequate, stable and dedicated funding. Agencies signatory to the Rapid Response agreement(s) should coordinate efforts to pursue funding options for Rapid Response program development, training and implementation.

Organizations and industries that have a vested interest in successful early detection and rapid response systems could participate in the development of funding sources.

a. Funding Analysis: Consider the following types of funding sources:

   1. A permanent funding source(s) maintained solely for rapid response actions. Without this, rapid response may not occur or may only occur by redirecting funds on short notice from other important programs.

   2. A user-fee system based on vectors for AIS introductions. This would be similar in concept to fees paid by the shipping industry for ballast water inspections or fees paid by the petroleum industry for an oil spill response program. Methods used by states that already have dedicated funding for rapid response can be emulated.

   3. Private/public partnerships for supporting rapid response efforts in the form of equipment, supplies, personnel or funding.

   4. One-time grants for specific planning or research projects related to rapid response.

b. Taxonomy Funds: Develop funding for taxonomic work to identify potential AIS specimens. In some cases, this will include genetic analysis (e.g. to determine presence or absence of microscopic larvae of AIS species, or help determine the origin of an introduction). Expert taxonomic work will bolster confidence that subsequent management decisions are based on solid information. There should also be funding to maintain specimens. The proper maintenance and documentation of specimens is especially important in cases where infestations are the subject of law enforcement actions and may also be beneficial for future AIS identification needs and research.

c. Professional Cost Analysis: Consider whether a detailed, professional analysis of rapid response costs to support funding requests is necessary (Task 10b).

d. Funding Development: Consider using funding for development purposes (i.e. grant writing).

Task 4. Finalize the Rapid Response Plan

Work that needs to be done to finalize the Rapid Response Plan includes:

a. Implementation Criteria: Develop the process and criteria for the State to use in determining the course of action to take for any new AIS introductions. Circulate for peer review.

b. Likely Species & Scenarios: Identify likely species and/or early detection scenarios for AIS. Run these scenarios through the criteria developed for Task 4a to fine-tune the criteria.

c. Agency Preparation: Develop information needed to help cooperating agencies designate and train, in advance, potential responders to AIS introductions.

d. Alternate Staff: Develop a procedure to designate and prepare potential alternate staff. This could avoid gaps in getting work done and minimize managerial time spent searching for substitutes during a response.

e. Personnel Directory: Develop a statewide Rapid Response Personnel Directory. These people could be called upon to participate during rapid response activities, and into an ICS response. Ideally the Directory should include staff that represent the full spectrum of knowledge and skills that might be necessary during rapid response activities (e.g. ICS

implementation, logistics, finance, legal and various technical experts). The development of this list and staff participation in Rapid Response planning and training will likely require support of executive level staff from the cooperating agencies.

f. Resource Directory: Develop and maintain a directory among cooperating agencies for equipment, operations centers, supply sources and associated contact people so that resources can be mobilized as quickly as possible during a response.

g. Taxonomic Experts: A list of taxonomic experts and protocols for requesting and using their services needs to be developed and periodically reviewed and updated. This would be a list of experts who have agreed to identify specimens for AIS Rapid Response efforts and appropriately preserve and catalog them.

h. Local Assistance Protocol: Develop a protocol for responding to a private entity or local government agency that wants to conduct a rapid response under its own direction but requests assistance or permits from one or more agencies signatory to the statewide Rapid Response Plan. Include this protocol in the rapid response training program.

i. Notification List: Develop a list of whom, outside of those directly involved, needs to be notified when rapid response procedures are being planned and implemented.

j. Database Compatibility: Consider whether information should be collected in a particular manner in order to be compatible with existing AIS databases. For example, the North American Weed Management Association has a list of required elements for weed mapping projects (www.nawma.org).

Task 5. Streamline permit processes for rapid response

DFG Invasive Species Program staff will coordinate with staff from relevant agencies to investigate and pursue possibilities for streamlining the regulatory permit processes that might be required for rapid response measures. General measures or best management practices necessary to comply with streamlined permitting can be incorporated into the Rapid Response Plan.

Task 6. Revise the Rapid Response Plan

a. Incorporate New Information: Periodically revise the Plan and incorporate anything learned by evaluating the Plan's effectiveness and consulting current scientific research and related technological developments. Revisions may also be necessary due to changes in funding, agency restructuring and environmental regulations. The interagency agreement(s) to cooperate on rapid response should include a procedure for making revisions to the Plan.

b. Notification of Plan Changes: DFG Invasive Species Coordinator should ensure that adopted changes to the Plan are circulated to people listed in the Rapid Response Personnel Directory and other appropriate staff among the cooperating agencies and organizations. Changes should be addressed in training activities.

c. Update Directories: DFG Invasive Species Program staff, with assistance and input from cooperating agencies and organizations, will be responsible for the periodic update and circulation of the Rapid Response Personnel Directory, the Rapid Response Resource Directory and the list of taxonomic experts.

Task 7. Develop species- or location-specific rapid response plans

Identify and prioritize certain species, groups of species or certain locations for the development of specific rapid response plans. Detailed technical information can allow this type of response plan to be implemented more efficiently than a generic response plan. The development of species- or location-specific rapid response plans is called for in Action 4A3 of the CAISMP. The process of prioritizing which species warrant the development of rapid response plans will also help guide the development of outreach materials for early detection efforts.

Task 8. Train employees, participants and team members

a. Training Program: Agencies that agree to cooperate on AIS rapid response need to participate in the development of a training program and train the employees likely to be involved in rapid response activities. Potential rapid response participants need to be familiar with the Rapid Response Plan, Incident Command System (ICS), and may need specialized training related to their likely duties during a rapid response. ICS training is available on-line at: http://training.fema.gov/IS/.

   There may be a need to develop supplemental training materials and presentations for information specific to California, AIS or other topics.

b. Drills: Ensure that training includes AIS rapid response drills using a variety of scenarios and locations around the state. This will also assist in fine-tuning the Rapid Response Plan.

Task 9. Conduct education and outreach

a. Outreach Planning: Outreach specialists from participating agencies and organizations should develop a plan of potential methods and protocols for conducting outreach to local communities, interest groups and the media during rapid response procedures. This could include sharing contact information for key groups such as boaters, anglers and marina owners.

b. Disruption of Regular Work: Within the cooperating agencies, supervisors of employees who are in the Rapid Response Personnel Directory should be made aware that rapid response work can supersede other projects on very short notice. Supervisors and employees who are on rapid response teams could discuss in advance how they plan to handle this potential source of disruption.

Task 10. Conduct research necessary for improved rapid response

a. Response Research: Academic institutions, government agencies and other organizations that agree to cooperate on rapid response should work together through various AIS working groups, professional and environmental organizations and commercial interests to promote research that can specifically improve or promote rapid response efforts.

b. Cost Research: Research the costs of rapid response, possible funding mechanisms (Task 3) and, if feasible, study the environmental and economic benefits and costs of conducting rapid response efforts versus not conducting rapid response. This may help governments decide how much to invest in rapid response measures.

Task 11. Develop interim rapid response protocols

This section addresses the question: What steps can be taken to prepare to implement a rapid response effort while a formal plan is going through the review and approval processes?

a. Memorandum of Understanding (MOU): The Directors of the appropriate agencies could sign an interim MOU directing their staff to participate in rapid response planning and implementation if a new AIS introduction occurs prior to the approval of the final plan.

b. Interim Funding: Management staff could identify and pursue interim funding sources for implementing a rapid response program.

c. Interim Strategy: Management level staff from cooperating agencies could informally agree upon an interim strategy regarding roles and responsibilities should an AIS introduction occur.

d. Permitting: Management level staff from cooperating agencies could discuss how, in the absence of a formal streamlined permitting process, their staff could work within the existing regulatory permit programs to facilitate a rapid response operation and direct staff to follow through on these interim measures.

e. Employee Assignment: Management level staff of cooperating agencies could assign employees to an interim core rapid response team or working group. This team could participate in some advance preparation and planning. In the event of a rapid response, this team would need to be augmented by additional staff based on the location of the response and the necessary areas of expertise.

V: Supporting Materials

Rapid Response Form 1. Suspect AIS Sighting Report

The reporter may not be able to provide all of the information requested below, but please fill in as many of the information fields as possible.

Report Tracking Number: _____ Date of Sighting: _____

Reporter's First and Last Name: _____

Reporter's Phone Numbers: Home: _____ Work: _____

Cell: _____

Reporter's E-Mail Address: _____

Reporter's Mailing Address:

_____

_____

Type of Organism (as specific a descriptive label as possible (e.g. submerged plant, shellfish, etc.):

Description of size, color, shape and other distinguishing characteristics:

Approximate number of individuals or area they occupy:

Location of sighting:

Directions and description of nearby landmarks:

Were any photographs taken or specimens collected? If so, where can they be obtained?

Landowner or Land Manager:

Possible Source of Introduction:

Name and Contact Information of Person Filling Out This Form:

Rapid Response Form 2. AIS Alert Report [1]

To be filled out by Species Identification Team member following up on a preliminary report of a possible AIS sighting (Form 1). The AIS Report will be expanded to two pages in the final draft to reduce the crowding on this form.

Species Name: Report Tracking #
Name of Person Filling out Form: Phone Number(s):
Agency:
Address: E-mail address:

Reporter's Name:
Reporter's Phone Number(s):
Reporter's e-mail:

Date of Pest Sighting:
If the identification was verified by expert, who provided the verification?
Verifier's phone number(s): E-mail:

Location of voucher specimens:

Sighting Location (if possible attach a map showing the location):
County: Body of water:

Landowner/Manager:
Describe location
(Relationship to nearby road intersection, pier, mile marker, buoy, other landmarks)

If possible, please provide map information (You choose the system):

T____ R____ Sec____, _____1/4 of ____1/4, Meridian: H__ M___ S___
T____ R____ Sec____, _____1/4 of ____1/4, Meridian: H__ M___ S___

Quad Name: Source of Coordinates (GPS, topo map & type):
GPS Make and Model: Horizontal Accuracy_____meters/feet

Datum: NAD27____ NAD83____ WGS84____
Coord. System Zone 10 ___ Zone 11___ or Geographic Latitude/Longitude_____

Describe pest species population (approximate number of individuals or stems, area they occupy)

Describe any evidence of reproduction (flowering, juvenile animals, egg masses, etc.)

Describe habitat: (e.g. plant community, associated plant species, host species, water depth, distance from bank, substrate characteristics (e.g. gravel, large rocks, silt, sand), etc.)

Photographs can be accessed at:

1 Based on California Department of Fish & Game, California Natural Diversity Data Base, "Native Species Field Survey Form" and the "Maui County Report A Pest Online Report Form," Maui County, HI.

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APPENDICES B-D

Introductory Notes

These appendices provide a detailed description of the primary federal and state laws, regulations and public policies that empower and direct different government agencies to manage AIS in California. They also describe the primary activities of government agencies – state, federal and regional – involved in AIS management, as well as most of the major committees and boards set up to coordinate and oversee such activities. These details are provided to support and expand on the information contained in the Management Framework provided in Chapter 4 and the Summary of Laws provided in Chapter 5 of this plan (as such, there is some repetition of information). While these appendices attempt to be comprehensive, there is inadequate space to present every single AIS program, law or activity in the state and nation. Through the web links provided below and further information in the appendices, more details on legal authorities and AIS stakeholders is available to all interested parties. A key to the acronyms used in these appendices can be found in the Acronym Glossary in the introductory pages of this plan. (*Note: Some laws and policies refer to ANS, aquatic nuisance species, rather than AIS, aquatic invasive species.)*

APPENDIX B: FEDERAL AUTHORITIES, LEGISLATION & AGENCIES

FEDERAL AUTHORITIES

No single federal agency has comprehensive authority for all aspects of aquatic invasive species management. Federal agencies with regulatory authority over the introduction and transport of aquatic species that may be invasive or noxious include the U.S. Department of Agriculture Animal Plant Health Inspection Service, the U.S. Department of Agriculture Agricultural Marketing Service, the U.S. Fish and Wildlife Service (USFWS), the U.S. Department of Commerce (DOC), and the U.S. Coast Guard (USCG). Many other agencies have programs and responsibilities that address components of AIS, such as importation, interstate transport, exclusion, control and eradication.

The primary federal authorities for managing and regulating AIS derive from the National Environmental Policy Act, the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA, 1990), the National Invasive Species Act (NISA, 1996), the Lacey Act, the Plant Pest Act, the Federal Noxious Weed Act, and the Endangered Species Act. An Executive Order signed by President William J. Clinton on February 3, 1999 expanded federal efforts to address AIS. The order created a National Invasive Species Council charged with developing a comprehensive plan to minimize the economic, ecological and human health impacts of invasive species.

Brief descriptions of the President's Executive Order, NANPCA and NISA are provided below, followed by an explanation of how federal activities are now coordinated through the national Aquatic Nuisance Species Task Force (ANSTF) and the National Invasive Species Council (NISC), and by descriptions of some of the earlier acts and laws still enforced in AIS management.

Primary Federal AIS Authorities

1990 – Nonindigenous Aquatic Nuisance Prevention and Control Act
(NANPCA; Title I of P. No.101-646, 16 U.S.C. 4701 et seq.)
http://www.anstaskforce.gov/default.php

The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA) established a federal program to prevent the introduction and control the spread of introduced aquatic nuisance species. The act provides an institutional framework that promotes and coordinates research, develops and applies prevention and control strategies, establishes national priorities, educates and informs citizens, and coordinates public programs. The act calls upon states to develop and implement comprehensive state management plans to prevent introduction and control the spread of aquatic nuisance species (ANS). Section 1002 of NANPCA outlines five objectives of the law, as follows:

1. Prevent further unintentional introductions of nonindigenous aquatic species;
2. Coordinate federally funded research, control efforts, and information dissemination;
3. Develop and carry out environmentally sound control methods to prevent, monitor and control unintentional introductions;
4. Understand and minimize economic and ecological damage; and
5. Establish a program of research and technology development to assist state governments.

Section 1201 of the act established the national ANSTF, co-chaired by the USFWS and the National Oceanic and Atmospheric Administration. The Task Force is charged with coordinating governmental efforts related to ANS prevention and control. The ANSTF consists of 10 federal agency representatives and 12 ex officio members representing nonfederal governmental agencies (see Other AIS Interests, Appendix D).

1996 – National Invasive Species Act
(NISA; P. No.104-332)

In 1996, the National Invasive Species Act (NISA) amended the NANPCA of 1990 to mandate ballast water exchange for vessels entering the Great Lakes and to implement voluntary ballast water exchange guidelines for all vessels with ballast on board that enter U.S. waters from outside the U.S. Exclusive Economic Zone (U.S. EEZ). Though the act did not make exchange mandatory, it did require all vessels to submit a report form to the USCG documenting specific ballast water management practices. It also authorized the USCG to toughen requirements if compliance proved unsatisfactory, which it did in 2004 (see below). NISA authorized funding for research on aquatic nuisance species prevention and control in Chesapeake Bay, the Gulf of Mexico, the Pacific coast, the Atlantic coast, and the San Francisco Bay-Delta Estuary. In addition, NISA required a ballast water management program to demonstrate technologies and practices to prevent ANS from being introduced into and spread through ballast water in U.S. waters. It modified both the composition and research priorities of the ANSTF and requirements for the zebra mussel demonstration program.

1999 – Executive Order 13112
(64 Fed. Reg. 6183)
http://www.invasivespeciesinfo.gov/council/main.shtml

President William J. Clinton signed Executive Order 13112 on Invasive Species on February 3, 1999. The order seeks to prevent the introduction of invasive species, provide for their control and minimize their impacts through improved coordination of federal agency efforts under a National Invasive Species Management Plan developed by the newly created National Invasive Species Council (NISC). The order directs all federal agencies to address invasive species concerns, as well as to refrain from actions likely to increase invasive species problems.

The NISC has three co-chairs: the secretaries of Agriculture, Commerce, and the Interior. Members also include the secretaries of State, Defense, Homeland Security, Treasury, Transportation and Health and Human Services, as well as the administrators of USEPA, the U.S. Agency for International Development, the U.S Trade Representative and the National Aeronautics and Space Administration. The NISC released the first National Invasive Species Management Plan in 2001. The NISC is currently working to establish federal and non-federal task teams to implement the plan's action items.

The NISC actively works with the Invasive Species Advisory Committee (ISAC), also established under the order. The ISAC is composed of stakeholder representatives from state governments, industry, conservation groups, academia and other interests. Its role is to advise the federal government on the issue of invasive species.

To help coordinate the work of the NISC and the ANSTF, the Department of Commerce (DOC) Policy Liaison to the NISC also serves as the DOC representative to the ANSTF. In addition, NISC and the ANSTF have formed joint working groups on each of the following topics: pathways, risk analysis and screening.

The ANSTF and the NISC are similar in that they perform coordinating functions but differ in their responsibilities: the NISC addresses all invasive species, while the ANSTF focuses on aquatic invasive species. Although many of the same principles apply to managing aquatic and terrestrial invasive species, many management issues are unique to the aquatic environment and need to be addressed separately.

1993-2005 – Coast Guard Regulations under NISA
(33 CFR 151)

The USCG has promulgated a number of ballast water management regulations based on the authority given to it by NANPCA in 1990 and NISA in 1996. As directed by NANPCA, in 1993, the USCG implemented regulations requiring vessels entering the Great Lakes and the Hudson River to conduct ballast water management after operating outside the U.S. EEZ.

To comply with the NISA, the USCG established regulations and guidelines to control the introduction of ANS via ballast water discharges in U.S. waters other than the Great Lakes. Compliance with the resulting voluntary ballast management and mandatory reporting program was only 30%, according to a 2002 Report to Congress. Therefore, under the authority of NISA, the USCG established mandatory ballast water management requirements and penalties for non-compliance. The mandatory program requires ships to use one of three ballast water management methods: 1) retaining ballast water on board, 2) conducting a mid-ocean exchange, and/or 3) using an approved ballast water treatment method. All vessels are required to submit ballast water management reports (failure to submit a report can now result in penalties). These mandatory regulations came into effect on September 27, 2004. Federal regulations also require vessels to maintain a ballast water management plan that is specific for that vessel and assigns responsibility to the master or appropriate official to understand and execute the ballast water management strategy for that vessel.

Under NANPCA/NISA, states are specifically permitted to regulate ballast water on ships. Several states have elected to do so to various degrees. In addition to reporting requirements, California, Oregon and Washington have ballast water exchange requirements and California will soon specify a ballast water discharge standard (see California Authorities section).

Other Federal Authorities

Animal Damage Control Act (1931)
http://www.aphis.usda.gov/

Under the Animal Damage Control Act, the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service has authority to control wildlife damage on federal, state, or private land, including damage from invasive species. The act protects field crops, vegetables, fruits, nuts, horticultural crops and commercial forests; freshwater aquaculture ponds and marine species cultivation areas; livestock on public and private range and in feedlots; public and private buildings and facilities; civilian and military aircraft; and public health.

Animal Health Protection Act (2002)
(7 U.S.C Sec. 8301, et seq.)
http://www.aphis.usda.gov/

The Animal Health Protection Act provides a flexible statutory framework for protecting domestic livestock from foreign pests and diseases. This act authorizes the USDA to promulgate regulations and take measures to prevent the introduction and dissemination of pests and diseases of livestock. The scope of such regulatory authority extends to the movement of all animals, domestic and wild, except humans. The fact that a pest or disease primarily affects animals other than livestock, including humans, does not limit USDA's authority to regulate a species, so long as it carries a pest or disease of livestock. Further, the act defines "livestock" to mean all farm-raised animals, clarifying the USDA's authority to conduct animal health protection activities in connection with farm-raised aquatic animals.

Clean Water Act
http://www.epa.gov/r5water/cwa.htm
http://unds.bah.com/default.htm

Various sections of the Clean Water Act (CWA) regulate discharges of pollutants (such as AIS and ballast water) and fill material to waters of the United States. Section 402 of the act authorizes the National Pollutant Discharge Elimination System (NPDES), a permit program intended to reduce and eliminate the discharge of pollutants from point sources that threaten to impair beneficial uses of water bodies. The act defines point sources to include vessels (Section 502(14)) and prohibits all point source discharges of pollutants into U.S. waters unless a permit has been issued either under Section 402 (NPDES) or Section 404 (dredge and fill activities).

California's Waste Discharge Requirements, issued by the state's Regional Water Quality Control Boards (RWQCBs), incorporate the authority of the federal NPDES permitting program for discharges of wastes to surface waters. In addition, under Section 303(d) of the each of the RWQCBs has the requirement to establish "a total maximum daily load for those pollutants which the (Environmental Protection Agency (USEPA)) Administrator identifies under Section 304(a) (2) as suitable for such calculation." This section of the CWA was developed to support a water quality-based system of effluent limits for chemical pollutants; the interpretation of what an allowable load of invasive species is has not been defined.

Under Section 305(b) of the CWA, California's nine RWQCBs are required to assess water bodies for attainment of beneficial uses every two years and report to the USEPA. In cases where beneficial uses of water bodies are shown to be impaired, Section 303(d) requires the Regional Boards to list the impaired water bodies and "establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters." Section 502(6) defines "pollutant" as dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, *biological materials,* radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water. Ballast water is considered to be a pollutant in discharges based on the above definition and definitions in the State Water Code.

Endangered Species Act of 1973
(ESA; 16 U.S.C.A. §§ 1531 to 1544)
http://www.fws.gov/endangered/

The ESA aims to protect endangered and threatened species. When non-native invasive species threaten endangered species, this act could be used as basis for their eradication or control by the USFWS or by the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA-Fisheries Service) The potential to harm a federally-listed species and the need to obtain a permit from the USFWS or NOAA-Fisheries Service should be taken into consideration when selecting methods to manage AIS.

Lacey Act (1900; amended 1998)
http://www.fws.gov/laws/lawsdigest/lacey.html

As the first federal act that tried to control migrations and importations of nonindigenous species, the Lacey Act prohibits the importation of a list of designated species and other vertebrates, mollusks and crustaceans that are "injurious to human beings, to the interests of agriculture, horticulture, forestry, or to wildlife or the wildlife resources of the United States." Under this law, it is unlawful to import, export, sell, acquire, or purchase fish, wildlife or plants taken, possessed, transported, or sold: 1) in violation of U.S. or Indian law, or 2) in interstate or foreign commerce involving any fish, wildlife, or plants taken possessed or sold in violation of State or foreign law.

The Lacey Act allows for the import of species for scientific, medical, education, exhibition or propagation purposes. The USFWS is the lead agency for enforcing the Lacey Act's prohibition of fish and wildlife imports.

National Environmental Policy Act of 1970
(NEPA; 42 U.S.C.A. §§ 4321 to 4370e)
http://www.epa.gov/compliance/nepa/index.html

NEPA requires the consideration of environmental impacts for any federal action, including direct federal activities, permitting and federal funding of activities by another entity. NEPA environmental documents may include a "finding of no significant impact (FONSI)," an "environmental assessment (EA)," or a full "environmental impact statement (EIS)." Potential impacts of invasive species, both direct and indirect, may be among the issues that should be considered under NEPA.

Noxious Weed Act
(1974; 7 U.S.C. § 360)

Section 15 of the Federal Noxious Weed Act requires federal land management agencies to develop and establish a management program for control of undesirable plants that are classified under state or federal law as undesirable, noxious, harmful, injurious or poisonous, on federal lands under the agency's jurisdiction (7 U.S.C. 2814(a)). The act also requires the federal land management agencies to enter into cooperative agreements to coordinate the management of undesirable plant species on federal lands where similar programs are being implemented on state and private lands in the same area (7 U.S.C. 2814(c)). The Secretaries of Agriculture and the Interior must coordinate their respective control, research and educational efforts relating to noxious weeds (7 U.S.C. 2814(f)). USDA's Departmental Regulation 9500-10 sets forth departmental policy relating to the management and coordination of noxious weeds activities among the agencies within USDA and other entities.

Plant Protection Act
(2000; 7 U.S.C. 7701)
http://www.aphis.usda.gov/

The Plant Protection Act (PPA) authorizes the USDA to prohibit or restrict the importation or interstate movement of any plant, plant product, biological control organism, noxious weed, article or means of conveyance if the Secretary of Agriculture determines that the prohibition or restriction is necessary to prevent the introduction into the United States, or the dissemination within the United States, of a plant pest or noxious weed.

The PPA specifically authorizes USDA to develop integrated management plans for noxious weeds for the geographic region or ecological range where the noxious weed is found in the United States. In addition, the act authorizes the USDA to cooperate with other federal agencies or entities, states or political subdivisions of states, national governments, local governments of other nations, domestic or international organizations or associations, and other persons to carry out the provisions of the act.

FEDERAL AGENCIES

Numerous federal agencies, presented here in alphabetical order, have authority to implement the laws and policies described above. Other federal agencies have mandates impacted by AIS and thus engage in research, monitoring, prevention or control programs. Still others delegate primary responsibility for implementation to state and regional agencies (see next section). The following descriptions attempt to provide a general introduction to the scope of each agency's work, as well as a brief review of the agency's recent (as of 2006) major AIS-related activities.

Bureau of Reclamation
http://www.usbr.gov/

The Bureau of Reclamation is involved in several important projects related to this issue. The Bureau has partnered with the DFG, USFWS and others to investigate the Chinese mitten crab infestation in the Sacramento-San Joaquin Delta. The agency participates in the Giant *Salvinia* Task Force's efforts to limit the spread of this invader in the Colorado River (see Appendix D), has a detection program for water hyacinth and participates in activities related to the New Zealand mudsnail infestation in Putah Creek. The agency also participated in DFA's *Hydrilla* Eradication Program.

National Oceanic and Atmospheric Administration (NOAA)
http://www.noaa.gov/

NOAA is the primary federal agency charged with management of marine resources. NOAA is the co-chair of the ANSTF and has been designated the Department of Commerce lead as co-chair of the National Invasive Species Council. Within NOAA, a number of national, state and regional agencies and programs are actively involved in AIS issues in California. These include: National Estuarine Research Reserve System (NERRS), a network of protected areas established for long-term research, education and stewardship; National Marine Fisheries Service, which works to protect fisheries habitat, commercial fisheries and endangered fish; National Marine Sanctuaries, the nation's system of marine protected areas, and Sea Grant, a nationwide network of 30 university-based programs that work with coastal communities and conduct scientific research and education projects designed to foster science-based decisions for the use and conservation of U.S. aquatic resources.

National Estuarine Research Reserve System (NOAA – NERRS)
http://nerrs.noaa.gov/
http://sfbaynerr.org
http://www.elkhornslough.org/
http://nerrs.noaa.gov/TijuanaRiver/

There are three reserves in California that provide a platform to increase communication between scientists, decision-makers, land managers, and the public in order to better deal with AIS issues. The San Francisco Bay reserve protects two large, relatively pristine, tidal wetlands: China Camp State Park in Marin County and Rush Ranch Open Space in Solano County. These sites are part of an AIS early detection and assessment study and detailed vegetation maps are being created to serve as a baseline to evaluate future invasions. China Camp serves as an uninvaded reference site for marshes invaded by *Spartina* hybrids in San Francisco Bay. Rush Ranch is a site of active research on invasive fish and invertebrates. The Elkhorn Slough reserve protects approximately 1,400 acres, including Elkhorn Slough, one of the few coastal wetlands remaining in California. Elkhorn estuarine habitats have over 60 species of non-native invertebrates, over 20 species of non-native plants and a few non-native fish and algae. All of these are currently widespread, so eradication seems impossible. Efforts are focused on early detection and eradication of species identified as "least wanted" invaders such as Chinese mitten crabs and *Caulerpa*. The reserve launched an early detection program for aquatic non-native invaders in 2002. The Tijuana River reserve's 2,500 acres encompass beach, dune, mudflat, salt marsh, riparian, coastal sage and upland habitats surrounded by the growing cities of Tijuana, Imperial Beach and San Diego. Critical invasive species issues include: tamarisk, ice plant and other exotic plants displacing native species in the salt marsh and upland habitats; ongoing surveys to understand the dynamics of AIS; and efforts to understand ecosystem recovery following eradication of invasives.

National Marine Fisheries Service (NOAA – Fisheries Service)
http://www.nmfs.noaa.gov/

NOAA-Fisheries Service is in charge sustaining the nation's fisheries, many of which are being directly impacted by AIS, and is involved in many AIS projects in California. It has a key role on the Southern California Caulerpa Action Team. NOAA-Fisheries Service is also involved with a variety of other collaborative research projects including: ballast water exchange, AIS risk evaluation research and hull fouling research funded by the Port of Oakland; analysis of biofouling communities and community effects; and surveys and experimental treatments of several invasive species in San Francisco Bay. NOAA-Fisheries Service also participates on several AIS advisory and coordinating committees including: the Pacific Ballast Water Group, Non-Native Invasive Species Advisory Council and the West Coast Ballast Outreach Project Advisory Team.

National Marine Sanctuaries (NOAA – NMS)
http://sanctuaries.noaa.gov/
http://channelislands.noaa.gov/
http://cordellbank.noaa.gov/
http://farallones.noaa.gov/
http://montereybay.noaa.gov/

California has four sanctuaries – Channel Islands NMS, Cordell Banks NMS, Gulf of Farallones NMS and Monterey Bay NMS. The latter two sanctuaries are in the process of developing aquatic invasive species management plans and have conducted monitoring programs for AIS.

National Sea Grant (NOAA – Sea Grant)
http://www.seagrant.noaa.gov/
http://www-csgc.ucsd.edu
http://ballast-outreach-ucsgep.ucdavis.edu/

The National Sea Grant Program is a partnership between the nation's universities and NOAA (under the Office of Oceanic and Atmospheric Research) that began in 1966. The California Sea Grant program is the largest of these programs. Sea Grant began the West Coast Ballast Outreach Project in 1999 (co-sponsored by the CALFED Bay-Delta Program) to address concerns that ballast water discharges could be introducing foreign marine species into the state's coastal and estuarine ecosystems. The project educates the maritime industry about the ecological seriousness of aquatic exotic species by publishing the newsletter "Ballast Exchange," maintaining an educational Web site and coordinating workshops. In addition, California Sea Grant provides two major services to the state. First, the research arm of California Sea Grant, operating out of the Scripps Institute for Oceanography in La Jolla, funds critical coastal and marine research through an annual request for proposal and a National Strategic Initiative (NSI) program. Through both of these avenues, the college program funded approximately $2.6 million in research on invasive species between 1995 and 2003. Second, Sea Grant and the University of California Cooperative Extension jointly fund a network of eleven advisors and specialists who work on applied research and outreach projects throughout the state, including those related to AIS. Sea Grant funding has supported a wide variety of research projects on key invasive species, such as the Chinese mitten crab, European green crab, an exotic Australian isopod, several invasive seaweeds, and *Spartina* hybrids. Sea Grant sponsored research led to the eradication of the South African *sabellid* worm at the site near Cayucos, California, where it had become established.

National Park Service (NPS)
www.nps.gov

NPS strives to preserve the unimpaired natural and cultural resources of the national park system for the enjoyment, education and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country. The NPS has several invasive species monitoring, control, research and eradication programs in California. Eradication and control are supported by two programs. The first is the (California) Exotic Plant Management Team (EPMT), which travels around the state to national parks that have requested assistance in removal and control projects. The EPMT has traditionally focused on terrestrial non-natives but could work on aquatic invaders. Through the second program, individual parks can request funds from Washington or the NPS Western Region for control and eradication projects. Natural resource inventories and monitoring activities occur in all of the National Parks in California, and these programs are well positioned to alert state managers to emerging and growing threats from invasive species. Information from these programs could be shared among the California AIS plan partners and benefit the state's early detection efforts. Finally, the NPS actively supports and hosts research projects on impacts of invasive species on ecological communities. National Parks in California, that participate with the EPMT, conduct invasive species inventories, monitoring and research on lands totaling about 2.4 million acres and include hundreds of miles of coastline. Significant education and outreach occurs at all of these sites.

U.S. Army Corps of Engineers (COE)
http://www.usace.army.mil/

The COE provides engineering, construction and environmental project services for the military and local governments. Congress authorizes the COE to assist local governments with water resource development needs, which include flood control, navigation, ecosystem restoration and watershed planning. For ecosystem restoration, this includes research on invasive species. Specific programs addressing invasive species issues include the Aquatic Nuisance Species Research Program, the Aquatic Plant Control Research Program and the Water Operations Technical Support Program. COE is also responsible for permitting aquaculture projects, including oyster farms, which often involves AIS considerations.

U.S. Coast Guard (USCG)
http://www.uscg.mil/hq/g-m/mso/bwm.htm

The USCG has established a mandatory program aimed at keeping aquatic nuisance species out of U.S. waters using ballast water management methods. USCG activities focus on enforcement and monitoring to ensure compliance with the program, which includes regular on-board inspections. USCG coordinates with California's State Lands Commission, manager of the state's ballast water program. In 2004, USCG issued "Ballast Water Management for the Control of Aquatic Nuisance Species in the Waters of the United States," a guidance document concerning ballast water management.

USCG activities related to AIS are diverse. The agency is working on the development of chemical and engineering methods to verify that a mid-ocean ballast water exchange has occurred. It is also evaluating technologies for the treatment of ballast water. USCG has determined that due to difficulties in establishing the effectiveness of ballast water exchange as it varies across ship types, voyages and from tank to tank, treatment technologies are best evaluated through a ballast water discharge standard (a benchmark for maximum numbers of organisms that may be discharged in ballast water). Such a standard will not only be helpful in evaluating the effectiveness of treatment technologies but also clearly establish when the ballast water no longer contains quantities of organisms that pose a significant risk. A Programmatic Environmental Impact Statement, detailing the evaluation of environmental impacts to the U.S. by several potential ballast water discharge standard alternatives, is currently in development.

USCG has also initiated several projects designed to provide information on the state of development of treatment technologies and the basic characteristics of treatment processes. These efforts have included scientific audits that tested and evaluated three approaches: filtration, ultraviolet light and hydro cyclonic separation. In addition, USCG developed and launched the Shipboard Technology Evaluation Program (STEP) in 2004 to encourage ship owners and operators to participate in evaluating technologies for shipboard application (see also CAISMP Action 7C3). This program allows for the review of experimental plans and treatment technology installations aboard ships. If they perform largely as designed and show promise for reducing the risk of introductions, treatment technology installations will be granted an equivalency with regulations for ballast water management and the Ballast Water Discharge Standard.

U.S. Department of Agriculture (USDA)
http://www.aphis.usda.gov/
http://www.ars.usda.gov/main/main.htm
http://www.invasivespeciesinfo.gov

USDA provides leadership on food, agriculture, natural resources and related issues. USDA conducts a number of programs and activities related to invasive species. USDA's Animal and Plant Health Inspection Service's (APHIS) deals with invaders like the South American wetland rodent, nutria, in the Mississippi Delta region and has also worked on other invasive animal, fish and crab problems around the country. APHIS has done extensive noxious weed work, including exclusion, permitting, eradication of incipient infestations, surveys, data management, public education, and (in cooperation with other agencies) integrated pest management of introduced weeds, including biological control. Aquatic weeds are included in the federal noxious weed list through the APHIS Cooperative Agricultural Pest Survey (CAPS).

The USDA's Agricultural Research Service (ARS) has three Exotic and Invasive Weed Research (EIWR) units in the west: at Davis and Albany, California, and at Reno, Nevada. Scientists at these facilities are responsible for research, the transfer of technology for improvement of management and control, and eradication of invasive aquatic and riparian weeds affecting agriculture and natural resources. These projects address three current ARS program priorities: 1) the reduction of dependence on pesticide use (specifically herbicides); 2) implementation of Executive Order 13112 (see above subsection on this order); and 3) water-quality improvement.

Research is conducted on the biology, reproduction, ecology, management or eradication of several important invasive aquatic weeds. The program provides technology transfer for the eradication and management of several problem species. The EIWR units are also involved in aquatic and riparian weed education for public, state and federal stakeholders.

U.S. Environmental Protection Agency (USEPA)
http://www.epa.gov/owow/invasive_species

USEPA leads the nation's environmental science, research, education and assessment efforts. It develops and enforces regulations, offers financial assistance, performs environmental research, sponsors voluntary partnerships and programs, furthers environmental education and publishes information. USEPA is responsible for enforcing the Clean Water Act (CWA). USEPA released its *EPA Authorities for Natural Resource Managers Developing Aquatic Invasive Species Rapid Response and Management Plans* in December 2005. This document provides an overview of USEPA authorities that apply to state or local AIS rapid response and control actions. The document summarizes relevant sections of the CWA and the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); summarizes how to apply for CWA Section 404 permits to discharge dredged or fill material; summarizes how to apply for FIFRA Section 18 emergency exemptions and FIFRA Section 24(c) special local need registrations; and describes case studies in which state and local natural resource managers successfully obtained FIFRA emergency

exemptions and special local need registrations for AIS eradication or control actions.

Within USEPA, there are three members of the National Estuary Program in California whose activities encompass AIS management.

National Estuary Program (USEPA – NEP)
http://www.epa.gov/nep
San Francisco Estuary Project: http://www.abag.org/bayarea/sfep/sfep.html
Morro Bay National Estuary Program: http://www.mbnep.org/index.php
Santa Monica Bay Restoration Commission: http://www.santamonicabay.org/

Congress established the National Estuary Program in 1987 to protect and improve the water quality and natural resources of estuaries nationwide. There are three programs in California. The San Francisco Estuary Project (SFEP) was formed in 1987 as a cooperative federal/state/local program to promote effective management of the San Francisco Bay-Delta Estuary, and created a consensus-based management plan for the Estuary including concrete actions related to invasive species. More recently, SFEP identified invasive species as the number-one priority issue in estuary restoration. SFEP holds an ex officio seat on the ANSTF and is a member of the Western Regional Panel.

The Morro Bay National Estuary Program was established in July 1995. The estuary contains the most significant wetland system along California's south-central coast. It supports many species of internationally-protected migratory birds, offers rare wetland habitat to a number of threatened native plant and animal species, and provides a protected harbor for marine fisheries. There are plans to suppress or eliminate at least two aquatic invasive species present in the estuary: giant cane and Sacramento pikeminnow. Efforts to eliminate a pioneer population of giant cane growing along Chorro Creek, a major estuary waterway, and its tributaries, are ongoing; eradication is expected by 2008. Efforts to suppress the pikeminnow to the point where native steelhead populations can begin recovery are expected to begin in 2007.

The Santa Monica Bay Restoration Project was established in 1988 to ensure the long-term health of the 266-square-mile Santa Monica Bay and its 400-square-mile watershed. In 2003, this project became an independent state organization, the Santa Monica Bay Restoration Commission. In terms of invasives, the commission has focused most recently on coastal bluff, wetland and riparian vegetation, funding extensive removal and replanting programs as well as outreach on "California friendly" gardens. The newest threat is the arrival of the New Zealand mudsnail in some Santa Monica mountains streams. The commission has convened experts to strategize how to slow the snail's spread.

U.S. Fish and Wildlife Service (USFWS)
http://www.fws.gov/
http://www.100thmeridian.org

USFWS has multiple programs that address AIS management. USFWS serves as co-chair of the Federal ANSTF and is the agency that provides federal funding for the implementation of Task Force approved state AIS management plans. USFWS also provides technical assistance to states regarding AIS management. USFWS administers the Lacey Act, which prohibits importation and interstate delivery of listed species. USFWS prevention programs include the 100th Meridian Initiative (see Appendix D), which focuses on preventing the western spread of zebra mussels. In cooperation with the ANSTF, the USFWS has developed planning documents for Chinese mitten crab, European green crab, New Zealand mudsnail and *Caulerpa.* USFWS refuges support invasive species control programs as part of their overall habitat restoration activities.

U.S. Geological Survey (USGS)
http://www.usgs.gov
http://nas.er.usgs.gov/

USGS acknowledged its role in non-native species management in a White Paper on Invasive Species, which identifies the goal of developing new strategies for the prevention, early detection and prompt eradication of new invaders. The USGS further identifies information management and documentation of invasions as a priority for the agency. In keeping with this objective, the USGS developed and maintains an extensive, spatially referenced database of non-native species, which is accessible online.

APPENDIX C: STATE AUTHORITIES, LEGISLATION & AGENCIES

In California, many state agencies have authority over and regulatory roles for managing natural resources. While diverse agencies have some authority to regulate AIS, there has been no centralized authority or management structure to coordinate AIS activities before this plan. The legal frameworks that apply to control of aquatic invasive species introductions are broad and varied. This section describes the existing authorities that various state agencies and entities have for managing AIS in California, and overlaps somewhat with information presented in Chapters 4 and 5. For help with acronyms, see the Acronym Glossary in the introductory pages of this plan.

CALIFORNIA AUTHORITIES

California Environmental Quality Act (CEQA)
(CA Public Resources Code §§ 21000 et seq.)
http://ceres.ca.gov/ceqa/

The California Environmental Quality Act (CEQA) requires public disclosure of all significant environmental effects of proposed discretionary projects. If a project would cause significant effects, final documents in the CEQA process show: 1) what mitigation measures will be required to reduce particular effects to a less significant level; and 2) provide justifications for the approval of the project with particular significant effects left unmitigated (i.e. a finding of overriding consideration). CEQA also contains lists of project types exempt from this process. A "significant" impact is a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, [and] fauna . . .". The documented adverse impacts associated with invasive species can fit this broad definition.

California Porter-Cologne Water Quality Control Act
(CA Water Code §§ 1300 et seq.)
http://www.swrcb.ca.gov/water_laws/docs/portercologne.pdf

Under California's Porter-Cologne Water Quality Control Act, "any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state" must file a report of the discharge with the appropriate Regional Water Quality Control Board (RWQCB). Pursuant to the act, the RWQCB then prescribes "waste discharge requirements" related to control of the discharge. The act defines "waste" broadly, and the term has been applied to a diverse array of materials. The San Francisco Bay RWQCB, for example, has determined that "ballast water and hull fouling discharges cause pollution as defined under the Porter-Cologne Water Quality Control Act."

The act, (California Water Code, Division 7), lists a number of types of pollutants that are subject to regulation by the State Water Resources Control Board (SWRCB). Section 13050, for example, specifically includes the regulation of "biological" pollutants by defining them as relevant characteristics of water quality subject to regulation by the Board: AIS are an example of this kind of pollutant if they are discharged to receiving waters. The SWRCB also regards the application of pesticides to control AIS in waters of the state as a discharge of a pollutant requiring an NPDES permit. Several of the Regional Boards have taken legal policy and enforcement actions related to AIS (see also CWA in Appendix B and SWRCB in California Agencies).

Fish and Game Code and Title 14 of the California Code of Regulations
http://www.fgc.ca.gov/html/regs.html
http://www.dfg.ca.gov/ospr/organizational/scientific/exotic/exotic%20report.htm

The Fish and Game Code consists of the laws passed by the state legislature that pertain to fish and wildlife resources. Under statutes in the Fish and Game Code, the California Fish and Game Commission has the responsibility for the adoption of regulations that provide details on how certain Fish and Game laws are to be implemented. These regulations are published in Title 14 of the California Code of Regulations. A summary is provided below of Fish and Game Code Sections that address invasive species issues or may relate to control actions.

F& G Code §§ 2080 – 2089 DFG regulates the take of species listed under the California Endangered Species Act. In addition to the instructions in the Fish and Game Code, guidelines for this process are located in Title 14, Division 1, Subdivision 3, Chapter 6, Article 1 of the California Code of Regulations. These statutes and regulations should be consulted if AIS control measures have the potential to impact State-listed species.

F & G Code §§ 2118, 2270-2300: DFG is responsible for enforcement of importation, transportation and sheltering of restricted live wild animals; places importation restrictions on aquatic plants and animals; and prohibits nine species of *Caulerpa*.

F & G Code §§6400-6403: It is unlawful to place live fish, fresh or saltwater animals or aquatic plants in any waters of this state without a permit from DFG.

F & G Code §§15000 et seq.: DFG is responsible for regulations pertaining to the aquaculture industry, including disease issues.

Harbors & Navigation Code

The Harbors & Navigation Code, Article 2, Section 64, authorizes the Department of Boating and Waterways to manage aquatic weeds affecting the navigation and use of the state's waterways.

Ballast Management for Control of Nonindigenous Species Act (AB 703) of 1999

This act charged the California State Lands Commission (SLC) with oversight of the state's first program to prevent nonindigenous species (NIS) introductions through the discharge of ballast water from commercial vessels of over 300 gross registered tons (GRT). The 1999 act required that vessels originating from outside the United States Economic Exclusive Zone (U.S. EEZ) carry out mid-ocean exchange or use an approved ballast water treatment method, before discharging in California state waters. The SLC was tasked with: receiving and processing ballast management reports from all such vessels, monitoring ballast management and discharge activities of vessels through submitted reports, inspecting vessels for compliance and assessing vessel reporting rates and compliance. The activities and analyses of the first few years of the program are detailed in the 2003 biennial report of the California Ballast Water Management Program. Upon the sunset of the act, the Marine Invasive Species Act (AB 433) was passed in 2003, revising and widening the scope of the program to more effectively address the invasion threat (see below).

Marine Invasive Species Act (AB 433) of 2003
(Public Resources Code, Sections 71200-71271;
Title 2, California Code of Regulations, Section 2271)

The Marine Invasive Species Act, passed in 2003, revises and recasts the state's law pertaining to control of nonindigenous species and ballast water management (AB 703). It imposes additional requirements upon vessel masters, owners, operators and persons in charge of vessels to prevent the introduction of nonindigenous species into waters of the state or waters that may impact the waters of the state. The bill deletes exemptions for specified vessels from compliance with the act and revises the qualifications for the vessels subject to the act.

Ballast water management is required of all vessels greater than 300 gross registered tons (GRT) that intend to discharge ballast water in California waters, though the regulations differ depending on voyage origin. All qualifying vessels coming from ports within the Pacific Coast region must conduct near-coast exchange (in waters at least 50 nautical miles offshore and 200 meters deep) or retain all ballast water and associated sediments. There are exceptions that address safety concerns and for vessels that transit wholly within defined shared waters (San Francisco/-Stockton/Sacramento Delta, and Los Angeles/Long Beach/El Segundo Complex).

All vessels must complete and submit a ballast water report form upon departure from each port of call in California. They must also comply with the good housekeeping practices, ranging from avoiding discharge near marine sanctuaries to rinsing anchors and removing fouling organisms from the hull. They must maintain a ballast water management plan prepared specifically for the vessel; keep a ballast water log outlining ballast water management activities for each ballast water tank on board the vessel, and make the separate ballast water log available for inspection; conduct training of vessel master, person in charge, and crew regarding the application of ballast water and sediment management and treatment procedures; and pay a fee for each qualifying voyage at their first port of call in California.

In addition to requirements imposed upon vessels operating in state waters, the SLC was charged with the development of several legislative reports offering policymaking guidance on commercial vessel AIS issues including: a Report on Commercial Vessel Fouling in California, Analysis, Evaluation and Recommendations to Reduce Nonindigenous Species Release from the Non-Ballast Water Vector; a Report on Performance Standards for Ballast Water Discharges in California Waters; and a Report on the California Marine Invasive Species Program. These efforts have resulted in the development of regulations to stem transport of AIS in the ballast water of vessels operating with the Pacific Coast Region; and legislation directing SLC to adopt regulations on performance standards for ballast water discharges.

Finally, the legislation also requires DFG to conduct a series of biological surveys to monitor new introductions to coastal and estuarine waters of the state and to assess the effectiveness of the management provision of the Act. AB 703, passed in 1999, required a baseline survey of the state's ports, harbors and bays. AB 433 expanded the baseline to include outer coast sites and required continued monitoring of all sites to determine if the ballast control measures have been successful in reducing the number of new introductions.

Coastal Ecosystems Protection Act of 2006
(Public Resources Code, Sections 71204.7 – 72423)
(Revenue and Taxation Code, Section 44008)

The Coastal Ecosystems Protection Act, passed in 2006, adds to the state's law pertaining to the discharge of ballast water (AB 433). It requires the SLC to adopt regulations that require an owner or operators of a vessel carrying, or capable of carrying, ballast water that operates in the waters of the state to implement certain interim and final performance standards for the discharge of ballast water.

California Ocean Protection Council Strategic Plan
http://resources.ca.gov/copc/strategic_plan.html
http://resources.ca.gov/copc

The California Ocean Protection Council, formed to coordinate the activities of ocean-related state agencies and improve state efforts to protect ocean resources, among other mandates (see California State Agencies), adopted a five-year strategic plan in 2006. The strategic plan supports the completion and implementation of both the state rapid response plan and this California Aquatic Invasive Species Management Plan, as well as the California Noxious and Invasive Weed Action Plan.

Delta Protection Act
www.delta.ca.gov

California's 1992 Delta Protection Act recognizes the natural resource significance of the 738,000 acre-Sacramento-San Joaquin Delta. The act seeks to preserve and protect Delta resources for the use and enjoyment of current and future generations and recognizes the threat posed by urban encroachment to the Delta's agriculture, wildlife habitat and recreation uses. Pursuant to the Act, a Land Use and Resource Management Plan for the Primary Zone (Management Plan) was completed and adopted by the Commission in 1995. The Management Plan sets out findings, policies and recommendations resulting from background studies in the areas of environment, utilities and infrastructure, land use, agriculture, water, recreation and access, levees and marine patrol boater education/safety programs. As mandated by the act, the policies of the Management Plan are incorporated in the General Plans of local entities having jurisdiction within the Primary Zone. Some of the plan sections relevant to AIS management include: Environment, Finding 8 and Recommendations 3 & 4; Water, Policy 2; and Marine Patrol, Boater Education & Safety, Policy 6 (see also Delta Protection Commission, Appendix D).

CALIFORNIA STATE AGENCIES

San Francisco Bay Conservation and Development Commission (BCDC)
http://www.bcdc.ca.gov/

The Bay Conservation and Development Commission is dedicated to the protection and enhancement of San Francisco Bay and to the encouragement of the Bay's responsible use. Any person or government agency wishing to place fill, extract materials or make any substantial change in use of any water, land or structure within the area of the Commission's jurisdiction requires a Commission permit or federal consistency determination. The Commission's jurisdiction includes San Francisco Bay, including tidal flats, subtidal areas and marshlands lying between mean high tide and five feet above mean sea level and a 100 foot shoreline band measured inland from the Bay shoreline, as defined by Section 66610 of the McAteer-Petris Act. The Commission recognizes the threat of non-native invasive species to the Bay's ecosystem and the *San Francisco Bay Plan* contains policies regarding the monitoring, control and eradication of aquatic invasive species in the Bay.

California Department of Boating and Waterways (DBW)
http://www.dbw.ca.gov/

DBW works to help develop convenient public access to California waterways, promote on-the-water safety and keep waterways free of navigational problems. General activities include boating law enforcement, boater education, improvements to boating facilities and vessel sewage management. In addition, DBW manages the state's largest and oldest aquatic weed control program, working with other public agencies to control water hyacinth, and more recently Brazilian elodea, in the Sacramento-San Joaquin Delta, its tributaries and the Suisun Marsh. DBW also leads the California Clean Boating Network, a collaboration of government, business, boating and academic organizations working to increase and improve clean boating education efforts, including invasive species education, across the state.

California Coastal Commission (CCC)
http://www.coastal.ca.gov/

The CCC is mandated to protect and enhance public access, recreation, wetlands, visual resources, agriculture, commercial activity, industrial activity and environmentally sensitive habitats within the coastal zone through coastal development permits, local coastal programs and federal consistency review. The CCC has responsibility to protect both the biology of aquatic ecosystems and the special uses associated with the marine environment, such as commercial fishing and recreation. The CCC regulates development activities in state waters under its coastal development permit authority and is responsible for working with local governments within the coastal zone. The CCC is also the designated coastal management agency administering the federal Coastal Zone Management Act (CZMA) over Pacific waters offshore of California (outside of San Francisco Bay). As such, the Coastal Commission exercises federal consistency review authority over all federal activities and federally licensed, permitted or funded activities affecting the coastal zone, regardless of whether the activity occurs within, landward, or seaward of the coastal zone boundary. Federal agency activities, including permits and plans, are subject to the consistency determination process, and must be "consistent to the maximum extent practicable" with the state's coastal management program, in this case, the Chapter 3 policies of the California Coastal Act (15 CFR § 930.32).

California Department of Fish and Game (DFG)
http://www.dfg.ca.gov/
http://www.dfg.ca.gov/ospr/

DFG has jurisdiction over the conservation, protection and management of fish, wildlife, plants and habitat necessary for biologically sustainable populations of those species. DFG conducts a number of programs related to aquatic invasive species, including serving as the lead agency in developing this statewide AIS management plan, as well as a rapid response plan for invasions (see Appendix A). DFG is responsible for enforcement of regulations concerning the aquaculture industry; the importation and transport of live wild animals, aquatic plants and fish into the state; and the placement of any such animals in state waters. The agency is also responsible for conducting biological surveys to assess the amount and types of AIS present in state waters, and the degree of success of ballast water management activities. Starting in 1999 with ballast management legislation, these surveys have been undertaken by DFG's Office of Spill Prevention and Response (DFG/OSPR). DFG/OSPR also manages the California Aquatic Non-Native Organism Database (CANOD) and is working to establish consistency among the various major databases being used to analyze similar types of AIS-related information. Lastly, DFG has been an active manager or partner in numerous AIS eradication and control programs, especially for those AIS that threaten at-risk species or the conservation and restoration of aquatic or riparian ecosystems.

California Department of Food and Agriculture (DFA)
http://www.cdfa.ca.gov/

DFA is the lead agency for regulatory activities associated with aquatic weeds. This regulatory authority includes quarantine, exterior pest exclusion (border protection stations and inspections), interior pest exclusion (pet/aquaria stores, aquatic plant dealers and nurseries) and detection and control/eradication programs. In addition, the DFA Plant Pest Diagnostic Center identifies plant species and assigns plant pest ratings. DFA maintains a rated list of noxious weed species. "A"-rated pests require eradication, containment, rejection or other holding actions at the state-county level. Quarantine interceptions are to be rejected or treated at any point in the state. For "B"-rated pests, eradication, containment, control or other holding actions are taken at the discretion of the agricultural commissioner. State-endorsed holding actions and eradication of "C"-rated pests occur only when these pests are found in a nursery. Action is taken to retard spread outside of nurseries at the discretion of the commissioner. Rejection occurs only when found in a crop seed for planting or at the discretion of the commissioner. "Q" ratings are temporary "A" ratings pending determination of a permanent rating. DFA is also responsible for the *Hydrilla* eradication program (see Chapter 2).

County Agricultural Commissioners (CACs)
http://www.cdfa.ca.gov/exec/cl/cacasa.htm

CACs have long been at the forefront in the battle against invasive species throughout the state. They work collaboratively with DFA and other agencies to exclude, detect and eradicate or manage a wide range of pest species. CACs perform numerous inspections of incoming plant materials, checking for compliance with quarantine requirements and for noxious weeds and other pests. Nurseries and pet stores are also inspected. The CACs have worked with DFA to obtain additional resources to fund more effective programs. Once plant materials enter the state, it is generally the CACs who perform inspections and carry out most of the weed eradication and management activities. While the CACs are not a "state" agency, they form a statewide system, represented at the state level by California Agricultural Commissioners and Sealers Association (CACASA) and have specific authorities granted by state law to carry out pest prevention programs.

California Department of Parks and Recreation (PARKS)
http://www.parks.ca.gov/

PARKS manages more than 270 park units and approximately 1.4 million acres, of which more than 280 miles is coastline and 625 miles of lake and river frontage. Management objectives of individual properties within the system depend on a unit's classification and range from a preservation mandate to a recreation emphasis. Units of the state park system can be established in either the terrestrial or underwater environment. Management to restore natural processes is basic to many types of state park units. This management includes removal of exotic species and is expected to extend below the waterline in units that are primarily terrestrial.

California Department of Pesticide Regulation (DPR)
http://www.cdpr.ca.gov/

DPR is vested with primary responsibility to enforce federal and state pesticide laws and regulations pertaining to the proper and safe use of pesticides in California. The Department regulates pesticides under a comprehensive program that includes enforcement of pesticide use in agricultural and urban environments, prevention of environmental contamination, environmental monitoring for emergency eradication projects and other related functions. DPR conducts monitoring of emergency eradication projects to ascertain that the public and the environment are being protected and the correct amounts of pesticides are being applied. DPR conducts sampling in consultation with the County Agricultural Commissioners, Department of Fish and Game, the RWQCBs and other stakeholders. DPR works cooperatively with other government agencies sharing information and monitoring results.

California Department of Water Resources (DWR)
http://www.water.ca.gov/

DWR addresses invasive species issues that impact water supply, water delivery and flood control. In general, DWR administers programs involving flood control for the Central Valley, dam safety for more than 1,200 dams statewide, design and construction of water facilities, water quality improvement and water supply data collection and studies. DWR also operates and maintains the State Water Project (SWP).

Recent activities related to invasive species are diverse. DWR conducts monthly monitoring of benthic (bottom-dwelling) invertebrates, zooplankton and phytoplankton throughout the upper San Francisco Estuary and reports trends in invertebrate abundance and community composition, including newly introduced species, to the State Water Resources Control Board. DWR is documenting the distribution of the invasive algal species *Microcystis spp*. in the upper San Francisco Estuary, investigating which strains (toxic versus non-toxic) are present and examining effects on the aquatic food web. DWR is also investigating the impacts of the Chinese mitten crab on the benthic invertebrate community in the Sacramento-San Joaquin Delta and co-authored a white paper on its life history.

On the prevention front, DWR implemented the California Zebra Mussel Watch Program until June 2005 (which included risk assessment, early detection, public outreach, the development of a rapid response plan for the Central Valley watershed and a centralized reporting system for mussel sightings). The future of this program depends on funding. At Lake Davis, DWR has been coordinating with DFG on northern pike control and downstream protection (including the installation of a structure to prevent pike escape over the dam). DWR contributes to programs aimed at controlling invasive weeds along eroding Sacramento River banks, within flood control and water conveyance structures and along urban streams. The agency coordinates its activities with other state and federal agencies as a member of the CALFED Non-native Invasive Species Advisory Council (NISAC).

California Ocean Protection Council (OPC)
http://www.coastalconservancy.ca.gov/

The OPC, created in 2004, is a state cabinet level council consisting of the Secretaries for Resources and the California Environmental Protection Agency, the chair of the State Lands Commission and two members of the Legislature. The OPC is a policy making body and also prioritizes the expenditure of various funds appropriated to other State departments for ocean protection purposes. The OPC has authorized funding for the completion of this AIS plan and is considering inclusion of implementation of this plan in its strategic plan as a major objective over the next five years. OPC's policies are administered by the Coastal Conservancy with direction from an Executive Policy Officer housed at the Resources Agency.

California State Lands Commission (SLC)
http://www.slc.ca.gov

SLC manages the mandatory, statewide, multi-agency Marine Invasive Species Program. This program works to implement regulations governing ballast water management for vessels operating on the West Coast of North America. Commission inspectors board approximately 25% of all vessels that arrive in California to verify compliance with regulations and to disseminate outreach materials to vessels and crews new to California. In addition to its regulatory activities, the Commission facilitates scientific research and technology development to enhance management efforts of the program and to inform policymakers. Limited funding is provided for research that targets priority information gaps and to technologies that show exceptional promise for the treatment of ballast water. In recent years, the SLC has also prepared a number of reports for the state legislature documenting commercial vessel fouling in California, proposing performance standards for ballast water discharges, and summarizing vessel ballast water activities and compliance in California (see also Ballast Water Management, California Authorities, and Chapter 5). In addition to the mandated Marine Invasive Species Program, the SLC has been coordinating interagency efforts to manage invasive aquatic plants such as Eurasian watermilfoil in Lake Tahoe (see Case Study, Chapter 8).

State Coastal Conservancy (SCC)
http://www.coastalconservancy.ca.gov/

SCC has been involved for over twenty years in the control and eradication of aquatic invasives, pursuant to Division 21 of the Public Resources Code. SCC developed, funded and operates the Invasive *Spartina* Project in San Francisco Bay that shows great promise in eradicating nonindigenous species of *Spartina* and their associated hybrids. SCC is also involved in efforts to control *Arundo* in many coastal watersheds. SCC directly develops projects and provides grant funds related to resources enhancement and restoration, including control and elimination of invasives. SCC is also a partner in developing this management plan.

The San Francisco Estuary Invasive *Spartina* Project (ISP)
http://www.spartina.org/

SCC established the ISP in 2000. Its overall goal is to develop and implement a regionally coordinated project to eradicate the four introduced and highly invasive *Spartina* species in the San Francisco Estuary. The ISP is comprised of a number of components, including outreach, research, permitting, mapping, monitoring and allocation of funds for efforts to eliminate populations of nonindigenous *Spartina*. In 2005 the Conservancy and ISP began full-scale implementation of the regionally coordinated *Spartina* Control Program (SCP), employing an aggressive treatment strategy to target nearly all infested sites in the San Francisco Estuary. Initial results show on average about 85% efficacy at treated sites. SCC will continue to coordinate the regional control effort through the ISP, and to allocate funds to land owners and managers around the San Francisco Bay for aggressive treatment activities consistent with the SCP. If funding

continues, it's expected that invasive *Spartina* will be effectively eradicated from the San Francisco Estuary between 2009 and 2011 (see also Case Study, Chapter 8).

State Water Resources Control Board (SWRCB)
http://www.swrcb.ca.gov/

The SWRCB's mission is to preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations. The Board has joint authority over water allocation and water quality protection. Under the State Board are nine Regional Water Quality Control Boards (RWQCBs). The SWRCB and regional boards have been working in support of, and in an advisory capacity to, other state agencies on various AIS activities, such as hull fouling and ballast water management. Invasives come under water board purview as part of the state's efforts to implement and enforce the Clean Water Act (CWA, see also Appendix B). A 2005 federal court ruling defined non-indigenous species as "pollutants" present in discharges from vessels and found that such discharges are not exempt from permitting requirements (NPDES, see also CWA, Appendix B).

In terms of AIS management activities, some of the regional boards have also sought to place specific water bodies within their regions on the CWA's 303(d) list, as impaired by exotics. S.F. Bay was listed in 1998. In 2006, the State Board placed the Delta, the Cosumnes River and a portion of the San Joaquin River on the 303 (d) list. Once on the 303(d) list, the regional boards are required to develop discharger/source based programs for managing pollutants, including the determination of "total maximum daily loads" (TMDLs)), which in the case of exotics have proved somewhat difficult to develop. Trying to allocate loads or goals for zero loads, among dischargers, water users and municipalities is challenging when most of the water bodies in question are already heavily invaded. Despite the implementation challenges, the S.F. Bay Water board's work on the state's first exotics TMDL did, however, widely publicize the problem and led to other successful AIS management and legislative programs.

Other regional boards have become involved in AIS-related water quality issues through watershed management projects, non-point source pollution management programs and wetland mitigation and restoration programs (raising issues about the use of non-native aquatic plant species for these programs, and the control of invasives, for example). The State Board has also participated in AIS management activities concerning the use of aquatic pesticides.

University of California (UC)
www.universityofcalifornia.edu
www.ipm.ucdavis.edu/

UC conducts extensive research on invasive species issues and has a substantial pool of scientists devoted to biological invasions and management. UC faculty serve on NGO, and state and federal government panels and committees charged with invasive species management. They also provide expertise and management for a variety of cooperative government units such as UC's Division of Agricultural and Natural Resources' (ANR) Integrated Pest Management Program and the Center for Invasive Species Research (UC Riverside). This center has managed the Exotic Species Research Program for USDA for almost five years. UC ANR also has Marine Advisors in most coastal counties in the state as part of the Sea Grant extension program. This provides a direct academic presence for extension outreach and applied research collaboration with agencies and campus faculty (see also National Sea Grant, Appendix B). UC also has formal graduate training programs on invasive species, such as the Integrative Graduate Education and Research Traineeship, based at UC Davis, in which the students intern with DFG, USFWS and other government agencies.

APPENDIX D: OTHER AIS INTERESTS

COORDINATING COMMITTEES, EDUCATIONAL INITIATIVES & SPECIAL INTEREST GROUPS

AIS spread across so many jurisdictions and impact so many different types of human activities and environmental priorities that diverse efforts have been made to promote coordination among AIS-involved agencies, organizations and stakeholders. Some of these, such as CALFED or the Western Regional Panel serve important functions in implementing federal and state mandates for coordination. Others provide ongoing forums for information sharing and priority setting among different agencies, organizations and interest groups, or among those attempting to restore or preserve specific waterways.

COORDINATING COMMITTEES & PARTNERSHIPS

Aquatic Nuisance Species Task Force
www.anstaskforce.gov

Federal legislation established the national Aquatic Nuisance Species Task Force (ANSTF), co-chaired by the USFWS and NOAA. ANSTF is charged with coordinating governmental efforts related to ANS prevention and control. ANSTF consists of 10 federal agency representatives and 12 ex officio members representing nonfederal governmental agencies.

Adopt-A-Riverway Program

This program is a government-volunteer partnership established in 2003. Participation in the program includes management of noxious and invasive weeds. Authorized program activities include planting and establishing native seedling trees, shrubs, native grasses, wildflowers, and removing litter and weeds, consistent with an integrated weed management plan. AB 66, a state bill, established an Adopt-A-Riverway Fund for proceeds donated, appropriated, transferred or otherwise received for purposes pertaining to the Adopt-A-Riverway Program.

Association of Fish and Wildlife Agencies (AFWA)
http://www.fishwildlife.org/

AFWA represents the government agencies responsible for North America's fish and wildlife resources. It promotes sound management and conservation and speaks with a unified voice on important fish and wildlife issues. AFWA was awarded a recent grant to create communications strategies on issues related to unwanted invasive aquatic species. This project will help states develop comprehensive programs to address aquatic nuisance species issues within their states and will collectively help the Regional Associations and the AFWA nationally develop a stronger voice and greater capabilities when addressing regional and national aquatic nuisance species efforts.

CALFED Bay-Delta Program (CALFED)
http://calwater.ca.gov/

CALFED is a cooperative effort of more than 20 state and federal agencies working with local communities to improve the water quality and reliability of California's water supplies and restore the San Francisco Bay-Delta ecosystem. One goal of CALFED's Ecosystem Restoration Program (ERP) has been to "prevent establishment of and reduce impacts from non-native species." The goal includes 10 specific objectives, such as eliminating further introductions of new species in ballast water of ships and preventing the invasion of the zebra mussel into California. CALFED has also developed a strategic plan for managing non-native invasive species in the San Francisco Bay-Delta Estuary and the Sacramento and San Joaquin Rivers and associated watersheds. To date, CALFED has funded 31 projects that address preventing the establishment of, or reducing the impacts from, non-native invasive species in California.

CALFED also created a Non-native Invasive Species Advisory Council (NISAC), a council of agency and technical stakeholders to advise the program on non-native invasive species.

California Horticultural Invasives Prevention (Cal-HIP)
www.suscon.org/invasives

This partnership develops strategies to reduce introductions of invasive plants through horticulture. Partners include environmental NGOs, agency representatives, and nursery and landscaping trade organizations. Sustainable Conservation, a nonprofit organization, facilitates the partnership.

California Interagency Noxious & Invasive Plant Committee (**CINIPC**)
http://www.cdfa.ca.gov/phpps/ipc/CINWCC/cinwcc_hp.htm

This committee, formerly known as California Interagency Noxious Weed Coordinating Committee (CINWCC), was formed in 1995, with a memorandum of understanding among 14 federal and state agencies. The committee changed its name again in 2006. Its mission is to facilitate, promote and coordinate the establishment of an integrated pest management partnership between public and private land managers toward the eradication and control of noxious weeds on federal and state lands and on private lands adjacent to public lands.

California Invasive Plant Council (**Cal-IPC**).
www.cal-ipc.org

This Council is a nonprofit organization that works to protect California wild lands from invasive plants through research, restoration and education. Cal-IPC proposes and facilitates solutions to problems caused by invasive plants. Membership includes public and private land managers, ecological consultants, researchers, planners, volunteer stewards and concerned citizens. Cal-IPC is recognized as an authoritative source of new information on all aspects of wild land weed management.

California Invasive Weed Awareness Coalition (**CALIWAC**)
www.cal-ipc.org/policy/state/caliwac.php

This coalition, made up of primarily industry stakeholders, was formed in 2001 to increase awareness of the invasive weed issue in California. The coalition's goals are to support the development of a statewide management plan for invasive weeds; provide a public forum to increase awareness of the detrimental environmental and economic effects of invasive weeds and contribute to solutions for invasive weed issues; promote increased funding for management of invasive weeds; and influence state and national policy on invasive weeds

California Weed Science Society (**CWSS**)
http://www.cwss.org/

This Society was founded in 1948 to promote environmentally sound proactive research and develop educational programs in weed science; support undergraduate/graduate students seeking a career in weed science; and encourage and support educational activities to promote integrated weed management systems.

County Weed Management Areas (**WMA**)

A Weed Management Area (WMA) is a local organization that brings together landowners and managers (private, city, county, state, and federal) in a county, multi-county or other geographical area for the purpose of coordinating and combining action and expertise in combating common invasive weed species. The WMA Support Program in DFA provides coordination and training opportunities and allocates state funding earmarked for WMAs.

Delta Protection Commission (DPC)
www.delta.ca.gov

California's 1992 Delta Protection Act created a Delta Protection Commission in recognition of the natural resource significance of the 738,000 acre-Sacramento-San Joaquin Delta. The Act seeks to preserve and protect Delta resources for the use and enjoyment of current and future generations and recognizes the threat posed by urban encroachment to the Delta's agriculture, wildlife habitat and recreation uses (see also Appendix C, State Authorities). The 19-member Delta Protection Commission provides for stakeholder representation in the areas of agriculture, habitat, and recreation. A land use and resource management plan for the primary zone of the Delta, completed in 1995 and updated in 2002, acknowledges the impacts of exotic species on Delta resources and makes recommendations for preventing impacts on native fish, and on aquatic, channel island and seasonal wetland habitats (including mosquito abatement projects).

Pacific Ballast Water Group (PBWG)
http://www.psmfc.org/ballast/

This group was formed by representatives from the shipping industry, state and federal agencies, environmental organizations, and others who recognized the need for a cooperative and coordinated regional approach to ballast water management to prevent the introduction of invasive species on the West Coast. The PBWG meets regularly and is currently addressing the development of ballast water discharge standards and inter-jurisdictional issues related to ballast water management on the West Coast.

Pacific States Marine Fisheries Commission (PSMFC)
http://www.psmfc.org/

PSMFC is one of three interstate commissions dedicated to resolving fishery issues. Representation includes the states of California, Oregon, Washington, Idaho and Alaska. The PSMFC does not have regulatory or management authority; rather, it serves as a forum for discussion, works towards coast wide consensus on state and federal authorities and addresses issues that fall outside state or regional management jurisdiction. Over the past four years, the Pacific States Marine Fisheries Commission's AIS program has concentrated on four species of aquatic invaders: Chinese mitten crab, European green crab, zebra/quagga mussel and Atlantic salmon. Program activities include research and monitoring, educational outreach, interjurisdictional planning and coordination, and funding and contracting services for numerous partners.

Western Governors' Association
http://www.westgov.org/

The Western Governors' Association is developing a new program to address undesirable nonindigenous aquatic and terrestrial species in the west. In 1998, the Western Governors passed a resolution on Undesirable Aquatic and Terrestrial Species to develop and coordinate western strategies and to support management actions to control and prevent the spread and introduction of undesirable species; support the use of integrated pest management concepts; encourage broad-based partnerships; and urge adequate support for the U.S. Department of Agriculture's Animal and Plant Health Inspection Service. The Association has formed a working group of state and federal agencies, industry, non-governmental organizations and academia to develop western strategies to limit the spread of these species.

Western Regional Panel (WRP)
http://www.fws.gov/answest/

This panel on Aquatic Nuisance Species was formed as a committee of the ANSTF after the passage of NISA to help limit the introduction, spread and impacts of aquatic nuisance species into western North America. This panel includes representatives from federal, state, and local agencies, Native American tribes, and private environmental and commercial interests, as well as a representative from Canada.

The general goals of the WRP are to prevent nuisance species introductions, coordinate activities of the western states among federal, local and tribal agencies and organizations, and minimize impacts of already established nuisance species. The purposes of the WRP, as described in NISA, are to: identify western region priorities for responding to aquatic nuisance species; make recommendations to the ANSTF regarding an education, monitoring (including inspection), prevention, and control program to prevent the spread of the zebra mussel west of the 100th meridian; coordinate other aquatic nuisance species activities in the west not conducted pursuant to the act; develop an emergency response strategy for federal, state, and local entities for stemming new invasions of aquatic nuisance species in the region; provide technical assistance to public and private stakeholders for preventing and controlling aquatic nuisance species infestations; and submit an annual report to the ANSTF describing activities related to ANS prevention, research and control.

MAJOR NATIONAL EDUCATION CAMPAIGNS

100th Meridian Initiative, USFWS
http://www.100thmeridian.org

The primary goal of the 100th Meridian Initiative is to prevent the further spread of zebra mussels. At the time it was formed, the western limit of the zebra/quagga mussel roughly coincided with the 100th meridian. It is the first large-scale, cross-jurisdictional effort to combat the spread of an aquatic invasive species. Participating entities include federal, state, local and tribal governments, potentially affected industries such as commercial boat haulers and other stakeholders. The initiative has produced an extensive public information and education campaign aimed at marina users, anglers and recreational boaters. It sponsors the production of posters, informational flyers and signs educating boaters about the risks of zebra mussels and other AIS. Its members conduct voluntary boat inspections and boater surveys to identify boats at highest risk for harboring AIS. Collected boater travel patterns are being used to model potential pathways for the mussel's spread. The initiative has supported the establishment of mussel monitoring stations across the west, as well as the development of regional rapid response plans should the mussel establish new populations. Recent programs include the Lewis and Clark Initiative, a program aimed at increasing outreach efforts to recreational boaters retracing the path of the historic expedition during its bicentennial. Among other accomplishments, the effort resulted in the establishment of more AIS monitoring stations and a mussel monitoring database for the Columbia River Basin region.

Habitattitude
www.habitattitude.net

Habitattitude is an ANSTF collaboration of the Pet Industry Joint Advisory Council (PIJAC), the U.S. Fish & Wildlife Service, the NOAA National Sea Grant College Program, and the nursery and landscape industry. It was established in 2004 to educate aquarium hobbyists, backyard pond owners, water garden enthusiasts, and others on how to prevent the spread of potential aquatic nuisance species. Its web site includes information on how non-native fish and plants can harm ecosystems, suggests environmentally sound alternatives to releasing unwanted aquatic plants and animals in the wild and offers tips on how to prevent accidental releases. The site offers promotional materials, signage and decals for participating retailers and manufacturers. The initiative offers a means for industry and the USFWS to work together to promote their shared interests in preventing AIS impacts.

Stop Aquatic Hitchhikers
www.protectyourwaters.com

The Stop Aquatic Hitchhikers web site is part of the ANSTF public awareness campaign. It is sponsored by the USFWS and the USCG. It functions as a reputable, central source of information about aquatic nuisance species affecting the United States. Resources include photos and descriptions of common nuisance species, how they impact ecosystems, boaters and anglers, and tips for preventing their spread. A news page features stories from major news outlets as well as government news releases related to AIS. Video and audio clips geared toward traveler information centers are available for download as are outreach materials such as posters, flyers, stickers for tackle boxes, banners and signs. Clubs, state and government agencies, and private entities are encouraged to join the campaign and pledge to prevent the spread of AIS. In California, partners include the DFG, California Trout, the City of Davis, Heal the Bay (Santa Monica), and the Santa Ana Zoo, among others.

SPECIES- & PLACE-SPECIFIC COALITIONS, INITIATIVES & NONPROFITS

100th Meridian Initiative, USFWS
(see Major National Education Campaigns)

California Sea Grant
(see Appendix B, NOAA – Sea Grant)

Channel Islands National Marine Sanctuary
(see Appendix B, NOAA – NMS)

Cordell Banks National Marine Sanctuary
(see Appendix B, NOAA – NMS)

Elkhorn Slough National Estuarine Research Reserve
(see Appendix B, NOAA – NERR)

Gulf of the Farallones National Marine Sanctuary
(see Appendix B, NOAA – NMS)

Invasive Spartina Project
(see Appendix C, State Coastal Conservancy)

Lower Colorado River Giant Salvinia Task Force
http://lcrsalvinia.org/salviniahome.asp

On August 4, 1999, the USFWS found giant salvinia in the Imperial National Wildlife Refuge on the Colorado River. Plants were also seen floating down the Colorado River, on the Cibola National Wildlife Refuge, and in Pretty Water and Three Finger lakes. Subsequent investigation determined that the source of the infestation was the West Side/Outfall Drain of the Palo Verde Irrigation District near Blythe, California. To ensure a coordinated response to the infestation, a task force was formed. Teams focused on accomplishing steps to control and/or eradicate giant salvinia in the lower Colorado River. Teams address issues relating to research, monitoring, rapid response, field implementation, regulation and compliance, outreach, and financial and international issues.

Monterey Bay National Marine Sanctuary
(see Appendix B, NOAA – NMS)

Morro Bay National Estuary Program (USEPA National Estuary Program)
(see Appendix B, USEPA – NEP)

San Francisco Bay National Estuarine Research Reserve
(see Appendix B, NOAA – NERR)

San Francisco Estuary Institute
www.sfei.org/bioinvasions

SFEI was founded as a non-profit organization in 1986 to foster the scientific understanding needed to protect and enhance the San Francisco Estuary. It is governed by a board composed of Bay Area scientists, environmentalists, regulators, local governments and industries. SFEI's Biological Invasions program conducts scientific and policy research and provides information and analyses on the introduction of exotic organisms into marine and freshwater ecosystems. In the last decade, the program has been actively working to improve understanding and management of invasive species, to document the status of invasive species in San Francisco Bay and the increasing rate of invasions. The program is also involved in

helping develop regulatory standards for ballast water discharges. Most recently, SFEI is chairing the scientific advisory panel that is providing guidance from the research community to the government agencies responding to the recent discovery of quagga mussel in California and performing some of the research identified by the quagga mussel incident command.

San Francisco Estuary Project (USEPA National Estuary Program)
(see Appendix B, USEPA – NEP)

Santa Monica Bay Restoration Commission (USEPA National Estuary Program)
(see Appendix B, USEPA – NEP)

Southern California Caulerpa Action Team (SCCAT)
http://www.sccat.net/

SCCAT was established to respond quickly and effectively to the discovery of *Caulerpa* in Southern California. The group consists of representatives from local, state, and federal governmental entities and from private organizations. SCCAT's goal is to completely eradicate all infestations in Agua Hedionda Lagoon and Huntington Harbour and to prevent new infestations (see also Chapter 8, Case Study)

Tahoe Basin Weed Coordinating Group
(775) 784-4848

This group is coordinated through the University of Nevada Cooperative Extension to address the increasing aquatic weed problem in the two-state Lake Tahoe Basin. This group and local agencies have undertaken mechanical removal of Eurasian watermilfoil and efforts are now being expanded, incorporating a variety of removal methods (see also Case Study, Chapter 8).

Team Arundo
http://www.sawpa.org/arundo/

Team Arundo was formed in Orange County, California, in 1991 to control *Arundo* along the Santa Ana River, and has since become a statewide program. Chapters exist in the Bay Area, San Luis Obispo and surrounding counties, Greater Los Angeles County, and San Diego County.

Team Arundo Del Norte
http://ceres.ca.gov/tadn/

Team Arundo Del Norte is a forum of local, state and federal organizations dedicated to the control of *Arundo* in rivers, creeks and wetlands in Central and Northern California. The organization formed in the summer of 1996 and meets several times per year in the Sacramento area to explore opportunities for information exchange and partnerships in support of the ongoing work of eradicating Ar*undo*.

Tijuana River National Estuarine Research Reserve
(see Appendix B, NOAA – NERRS)

APPENDIX E: AIS PLAN DEVELOPMENT & PROCESS

An initial draft of this plan was developed for DFG several years ago with stakeholder input (see below). At that time the plan was not completed due to funding and staffing issues. In 2006, additional funding was awarded to SFEP from the OPC, through the SCC, to finish and begin implementation of the plan.

2006 Draft & Final Plan Process

The 2006 draft of the plan incorporated much of the text, research and public comments provided by the original 2004 draft (see below).

In early 2006, agency staff reviewed the 2004 version and suggested updates. The resulting draft was circulated two times for review and comment by AIS program managers within lead state and federal agencies. Two internal meetings – one in June, and one in July – were held to discuss the draft and documented in meeting notes. Revisions were made accordingly.

The resulting draft plan was posted for public review on August 22nd, 2006. Three public meetings were held in August and September 2006 in Oakland, Sacramento and Long Beach to review the draft plan. Public comments were reviewed and incorporated to the extent possible.

Attendees at one or more of 2006 internal interagency meetings included:

Susan Ellis, DFG
Abe Doherty, SCC
Julie Horenstein, DFG
Dan Wilson, DFG
Paul Ryan, DBW
Geoff Newman, DBW
Terri Ely, DBW
Marian Ashe, DFG/OSPR
Jeffrey Herod, USFWS
Marcia Carlock, DBW
Suzanne Gilmore, SLC
Tanya Veldhuizen, DWR
Lynn Takata, SLC
Ben Becker, NPS
Karen McDowell, SFEP
Maurya Falkner, SLC
Pat Akers, DFA

2006 Public Meetings Summary

Background

A Draft AIS Plan was publicly released in late August 2006 and three public meetings were held in August and September to solicit input. The following pages summarize the presentation used at all three meetings and present comments and questions raised by meeting attendees. In addition, the results from a "prioritization" exercise conducted at each meeting are presented.

Meeting Overview

The meetings were called to order by Austin McInerny, facilitator, from the Center for Collaborative Policy, California State University, Sacramento. After McInerny provided an overview of the meeting agenda, participants and staff involved in preparing the Draft AIS Plan, introduced themselves. Project staff participating in the meetings included:

- Susan Ellis, Invasive Species Coordinator, DFG
- Julie Horenstein, DFG
- Karen McDowell, Project Coordinator, SFEP
- Abe Doherty, Project Manager, SCC
- Paula Trigueros, SFEP (note taker)
- Debbi Egter Van Wissekerke, SFEP (logistics manager)

Karen McDowell provided a brief background and overview of the plan's development process and explained the need to complete the plan to qualify for federal funding. She further clarified that the plan is to provide a management framework for agency coordination and that the anticipated adoption timeline is very aggressive. She reviewed the required components of the plan and explained the proposed management framework and the Technical Advisory Panels. She highlighted the objectives, strategies and action items for implementation and noted the priority section would be completed following the public review process. She explained the appendices including the Rapid Response Plan. Next steps included posting updates on the website and including the public comments as an Appendix also to be posted on the web. The complete presentation is available online at:
http://sfep.abag.ca.gov/projects/invasive_species.html

Following the presentation, a short question and answer period was held to address questions on how the plan was developed. Then, meeting attendees provided feedback, comments, and questions regarding the Draft AIS Plan. Lastly, meeting attendees were asked to review the proposed Action Items proposed in the plan and identify what they believed were both "high" and "low" priority action items.

Comment forms were provided and copies of the Draft AIS Plan were available for review.

Public Meeting #1 (Sacramento) Summary

The meeting was held August 28 in the auditorium of the California Department of Food & Agriculture and had nearly 30 attendees. The following comments and questions were raised:

- Woody Schon, Sacramento/Yolo Mosquito & Vector Control District: Expressed concern with Action 2E4 regarding use of mosquito fish for mosquito control. His district uses fish to control mosquitoes in degraded habitats such as rice or agricultural fields that are not flowing into streams, rivers or vernal pools and does not want to see these fish excluded as a tool for mosquito control.

- Raynor Tsuneyoshi, Director, DBW: Would like to see Collaborative Center for AIS at a university. Concern with hull cleaning for small boats – it is 9 times more expensive to haul a boat out of the water for hull cleaning than to clean in the water. There is in-water technology for anti-fouling for large boats but not for small. Regarding cleaning stations, who would fund, and how would they be distributed around the state? Recommended the development of remedies for specific behaviors – fishing boats, trans-Pacific yacht racing. Recommends going slow to curtail copper based hull paint as it slows down hull fouling.

- Dave Breninger- General Manager Placer Co Water Agency; Director ACWA; Director RBOC: Concern with water quality issues (agricultural water and the delta). Need to link water agency and boating concerns (Objective 2I). His water district is plagued with non-natives. Need to eradicate in waterways. Likes use of native plants. Need to make recreational boaters part of the solution. *Egeria* should be eradicated. Need a positive way to put money into solution.

- Duane L. Schnabel, Primary State Biologist, DFA: Although the plan cites NEPA/CEQA in Appendix B there is no discussion of when an EIR will be done for the plan. People need to know if the actions will do more harm than good.

- Ted Grosholz, Dept. of Environmental Science & Policy, UC Davis: He is a cooperative extension researcher who developed the initial plan. The plan as written has an absence of university and research institution participation. The plan ignores non-agency participants in AIS work. Action 1A6 calling for a data base of AIS projects ignores already existing National Biological Species nodes at UC Davis and UC Santa Barbara. Actions 6A3-11 ignores cooperative extension and sea grant work in progress for years. Actions 7A1-2 to complete AIS studies ignores work under development at the universities. The plan needs to bring the University of California into the management plan. The Ocean Protection Council endorsed a university inter-agency center for AIS and the center is not included as part of this plan. The center needs to be part of the plan and needs to be stated explicitly.

- Rick Grosberg, Center for Population Biology, UC Davis: The threat of AIS was identified by the research community and not state agencies. The document completely ignores the contributions of the research community. UC Davis formed an AIS council that is not included or even mentioned. The management framework includes only agency leaders who will meet (When? For What?). The Document needs to integrate geographically and biologically. It does not provide a management framework for integration at all levels. There is a missing objective for coordination of research problems, ecological problems, biological problems; the structure for coordination is not listed as an objective. Document does a good job identifying problems but fails in coordination and development of policy.

- Rebecca Verity - UCOP: UCOP supports the University of California and CSU's disappointment at being left out of the plan. The state constitution designated the University of California as the research arm of the State of California. The university was

told there would be an AIS Center for coordination of research, surveys and development of new tools. All faculty were told the bones of the center would be in the management plan. They are very disappointed it is not.

- Jodi Cassell, Sea Grant: Has been involved in outreach and applied research on AIS. Jodi herself has been involved for 8 years. They are also a funding source having funded $1,800,000 in AIS projects and outreach. They are very disappointed the plan ignores all non-state agency work related to AIS. Sea Grant is not mentioned at all in the plan although they have done extensive outreach on ballast water management, newsletters, research on hull fouling, transport vectors, establishing a network of advisors, etc. She feels the agency role should be to coordinate ongoing programs. DFG is not in outreach; outreach is not a strong component of their mandate. She felt the plan needed to use existing resources and not push them out of the management plan.

- Elaine Sledge, National Paint and Coatings Association: The association concurs with the plan findings on the threat of AIS. They support prevention vs. control and eradication. Coatings must have copper for anti-fouling. Inter-coastal vessels transport AIS. There are also non-ballast vectors. Non-biocide coatings are preferred. Written comments will provide additional information.

- Ron Eng, DFA: Action 2I1 proposes adding staff and hours at DFA Border Protection Stations with no indication of how this would be funded.

- Clint Meyer, Project Manager, Michael Brandman Associates: There is already a good regulatory program through CEQA. CEQA should be updated to address terrestrial and aquatic invasive species.

Public Meeting #2 (Oakland) Summary
The meeting was held August 30 in the Association of Bay Area Governments / Metropolitan Transportation Commission's conference room and had nearly 25 attendees. The following comments and questions were raised:

- Karl Malamud-Roam, Mosquito Ecologist, Contra Costa Mosquito VCD: He stated the regulatory aspects on control of public health were good. AIS present a huge problem. Insects and the diseases that come with them require continual surveillance and rapid response which the districts have in place. There is confusion in tone in the introduction; the plan treats non-native species and invasives as synonymous. The definition of invasives is not clear; the federal definition emphasizes harm (as stated in first paragraph) but the second paragraph treats all non-natives as invasive. It should not assume that non-native is detrimental; there are benefits of non-natives. The mosquito fish comments need correcting. There is a presumption that mosquito fish are known to harm; be careful of context of usage. They are a tool for resource management.

- Steve Hajik, Lake Co. Dept. of Agriculture: Spraying requires a permit from the regulatory water agency. County only allows licensed sprayers and inspects all applicators. His county passed an ordinance that lists banned weeds. He commented the plan should not forget agricultural commission offices.

- Caitlin Sweeney, SF Bay Conservation & Development Commission (BCDC): There is a critical omission of BCDC in the management plan. They have enforceable policies on fill, dredging, tidal marsh restoration projects and require eradication permits in their jurisdiction.

- Doug Johnson, California Invasive Plant Council: Plan needs to emphasize the impacts of chemical treatment as well as the impacts of all treatments. High level coordination

under Strategy 1A should include agricultural and environmental groups; should be strengthened to advocate for AIS council not partitioned as aquatic, but all inclusive.

- Cathy McGowan, Office of Research, UCOP: Lawrence Coleman, Vice Provost will submit detailed comments in writing. Cathy read from a 4-page document (attached) with preliminary comments. Solutions must be cross-cutting; researchers, policy makers and managers must work together. There must be formation of a California Center for Invasive Species; UC supports this strongly and wants it added to the plan. The plan needs to include members of UC and Sea Grant on the CAAIST (1A2). The section on Education and Outreach needs to include the UC Riverside Aquatic Center and Sea Grant Extension outreach. The education of ongoing researchers needs to be added. Section 7 provides an excellent start but needs to be expanded to include an academic research center.

- Mike Connor, Executive Director, San Francisco Estuary Institute (SFEI): SFEI has been working on biological invasions for over a decade. The rate of invasions is increasing; at present they are working on a multi-agency rapid response effort to eradicate invasive oysters in the South Bay. The report needs three things; 1) transparency; 2) peer review; and 3) competitive funding. First, transparency, the public cannot figure out who is working on what and therefore cannot determine overall success. Second, there is no call for outside peer review, which is necessary to insure that implementation is up to date. This is crucial for incorporation into the report. Third, there should be provision for competitive funding of line items in the document. Funding should go through a competitive process to insure transparency and the best quality work.

- Cathy Roybal, Contra Costa Dept. of Agriculture: Local county agricultural offices need to be involved.

- Karl Malamud-Roam, Mosquito Ecologist, Contra Costa Mosquito VCD: Department of Health Services needs to be added to agencies; the Health & Safety Code needs to be added to statutes. Use of vector should be carefully defined; conventional use includes mosquito control. The Society of Wetland Scientists was the first concerned with invasive cord grass. Strong kudos for rapid response.

- Arthur Berlowitz, U.S. Department of Agriculture (USDA): Goal is to prevent invasive species if we can. USDA reviews plants for the aquarium trade. He does not see how USDA can interface with the plan; it is not clear how USDA fits in. Thinks a center is a great idea. Document should show who has jurisdiction over what part of invasive species control.

- Sarah Mannell, Mill Valley, CA: She wants to know who does the public contact about invasive species. There are large carp in Corte Madera Creek; a protected creek; with steelhead fry in their guts.

Public Meeting #3 (Long Beach) Summary

The meeting was held at the Port of Long Beach Board Room on September 1 and had eight attendees. While no comments were presented, meeting attendees did raise the following questions:

1. How does the plan articulate agricultural invasive plants?
   Answer: DFA is on the coordinating committee. The committee also worked with DPR.

2. For the Technical Advisory Committee, will there be one for the state, or will there be regional panels to focus on the issues for that region?
   Answer: Having regional coordinating panels is a good suggestion and will be considered during finalization and/or implementation of the plan.

3. How much public outreach was there for these public meetings? He did not see a full press announcement.
   Answer: There was targeted outreach to the OPC mailing list, stakeholder groups, web sites and DFG did a press release.

4. Is this a modification of an existing plan or a new plan?
   Answer: It is restructured and rewritten from an earlier draft.

5. How is the SFEP associated with the project?
   Answer: SFEP was contracted for one year by the SCC with funding from the Ocean Protection Council to finish the state AIS Plan.

6. Has there been outreach to shipping companies?
   Answer: SLC, which is in charge of the ballast water program, has been keeping shipping up to speed. The ballast water recommendations were taken from the proposed actions. The plan basically looks at vectors other than shipping.

Prioritization Exercise Results

At all three meetings, posters were provided on the walls for attendees to indicate which action items (as described in the Draft AIS Plan) they believed should be “high” and “low” priority. After the close of the public comment period, meeting attendees held informal conversations with project staff and added to the posters. The posters were brought to each subsequent meeting to allow attendees to see which action items other individuals had prioritized.

One action was identified as extremely important: 8A3. Pursue the authority for DFG and DFA to establish a Rapid Response Program.

The following information was collected. Some of the action numbers changed as comments were addressed and the draft plan was finalized. The action numbers below were updated to reflect the new numbers; some of the original actions were deleted or moved in the editing process. Some of the action language has been edited since this summary was made. A few actions are listed as both high and low priorities because of differing opinions among participants. For final priorities identified see Chapter 8.

Objective 1: Coordination & Collaboration

High Priority Actions

1A1. Develop an executive level consultation process.
1A2. Form the California Agencies AIS Team (CAAIST).
1A7. Identify lead state agencies for particular AIS, water bodies and invasion vectors.
1A8. Identify agency personnel required for AIS management.
1A9. Improve state websites related to AIS.
1A10. Assess effectiveness of and gaps in AIS programs.
1B4. Expand participation in local AIS efforts and task forces.
1B5. Expand participation in regional, national and international AIS task forces.
1B7. Participate in national and international conferences.
1C2. Establish stable, long-term funding to help implement this plan.
1C3. Provide state funding for the AIS positions.
1C4. Provide state funding for a rapid response program.
1C5. Hire a funding development specialist.
1C6. Provide new funding mechanisms.

Low Priority Actions

All remaining actions for this objective not shown as high priority above.

Objective 2: Prevention

High Priority Actions

- 2B1. Quantify the ballast water and hull fouling vectors and assess invasion risk.
- 2B2. Continue and improve state ballast water inspection and enforcement program.
- 2B3. Implement discharge standards for treated ballast water.
- 2B4. Identify and address gaps in the Marine Invasive Species Program.
- 2B7. Quantify and assess the role of commercial fishing vessels as AIS vector.
- 2C1. Quantify and assess the role of recreational boating as an AIS vector.
- 2C2. Develop a recreational boating outreach and management program.
- 2C3. Develop a watercraft inspection program for high priority boat launch sites.
- 2C4. Quantify and assess the role of recreational fishing as an AIS vector.
- 2C5. Develop a recreational fishing outreach and management program.
- 2C6. Develop guidelines for: disposal of invasive species, cleaning of gear disposal of live bait.
- 2D1. Quantify and assess live bait as an AIS vector.
- 2E1. Quantify and assess fisheries enhancement as an AIS vector.
- 2I1. Increase staffing and hours of operation at DFA Border Protection Stations.
- 2I2. Develop guidelines for border inspections.
- 2I3. Increase DFG enforcement of current regulations on prohibited and restricted species.
- 2I4. Ensure adequate staffing and cargo inspection guidelines at ports and airports.
- 2I5. Continue disease sampling for shipments and stocks of live aquatic species.
- 2I6. Identify mail order, online vendors selling CA prohibited and restricted species.

Low Priority Actions

- 2B3. Implement discharge standards for treated ballast water.
- 2B4. Identify and address gaps in the Marine Invasive Species Program.
- 2C All actions mandating hull cleaning and/or inspections.
- 2C10 Link activities to the national Stop Aquatic Hitchhikers campaign. (Action later deleted).
- 2E4. Weigh benefits of mosquito-fish introductions.

Objective 3: Early Detection & Monitoring

High Priority Actions

- 3A1. Assess current monitoring of the state waters for early detection opportunities.
- 3A3. Develop statewide approach to early detection.
- 3A4. Outreach to those regularly sampling state waters.
- 3A5. Create and train a statewide citizen monitoring network.
- 3B1. Assess long-term AIS monitoring of state waters.
- 3B3. Monitor locations with high invasion rates.
- 3B7. Review the efficacy of long-term monitoring systems.

Low Priority Actions

- 3B6. Include maps of existing AIS in California waters in DFG BIOS system.

Objective 4: Rapid Response & Eradication

High Priority Actions

- 4A1. Develop and implement a statewide rapid response plan.
- 4A2. Evaluate and coordinate existing systems for reporting AIS sightings.
- 4A3. Clarify among the agencies and organizations involved who is responsible for which areas and/or species. (This action from August ’06 draft has been deleted. It will be addressed through current actions 4A1 and 4A3).
- 4A4. Explore permanent funding to implement rapid response.
- 4B1. Review effectiveness of eradication programs.

4B2. Continue and complete current eradication efforts.
4B3. Standardize criteria for identifying priority species for eradication.
4B4. Develop a method to prioritize sites of AIS invasion concern.

Low Priority Actions

All remaining actions for this objective not shown as high priority above.

Objective 5: Long-Term Control & Management

High Priority Actions

5B All strategy action items; limit the dispersal of established AIS to new water bodies.
5C2. Coordinate entities to meet AIS protection and restoration objectives.
5C6. Assess guidelines for preventing AIS spread in habitat restoration and shoreline landscaping projects. (See 6C5)

Low Priority Actions

5B1. Establish boat washing stations and disposal facilities at infested water bodies.
5B3. Use volunteer monitors to conduct AIS inspections.

Objective 6: Education & Outreach

High Priority Actions

6A1. Inventory education and outreach efforts. Develop a state AIS communication strategy.
6A2. Partner with ongoing outreach campaigns.
6A4. Develop posters, brochures and articles for industry sectors and user groups.
6A5. Develop permanent interpretive displays at marinas, boat ramps, and fishing sites.
6A6. Work directly with industry trade shows to deliver the AIS message.
6A7. Present AIS information at public gatherings.
6A8. Include AIS information in state hunting, fishing and boating regulations and licenses.
6A9. Include AIS information in fishing and recreational publications.
6A10. Develop and distribute AIS identification cards
6A11. Encourage industries to offer noninvasive alternatives to AIS.
6A12. Partner with stakeholders and interest groups to broaden education efforts.
6A13. Educate waterfront and shoreline property owners about AIS.
6A14. Develop and offer AIS management classes for professional organizations.
6A15. Continue state education measures concerning ballast water.
6C2. Educate researchers on AIS containment, disposal methods and legal restrictions.
6C5. Disseminate guidelines to promote the use of native plants. (See 5C6)

Objective 7: Research

High Priority Actions

Note: suggestion was made to add “increase coordination of researchers and develop research agenda based on high priority research needs.”

7A1. Host workshops to develop AIS research priorities and identify gaps.
7A2. Assess, continue and complete current studies.
7A3. Develop a strategy to communicate and support research needs.
7C4. Identify opportunities for interagency funding of AIS management research.

Low Priority Actions

7C3. Consider test center to evaluate ballast water treatment technologies.

Objective 8: Policy

High Priority Actions

- 8A1. Establish a regulatory review committee.
- 8A2. Identify the potential for improved regulatory coordination.
- 8A3. Pursue the authority to establish an interagency rapid response program.
- 8A4. Explore the need for additional state authority for AIS management.
- 8A6. Review current system for regulating plant and animal importations. .

Low Priority Actions

None indicated

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*Mtg. = meeting locations
Sac – Sacramento, August 28, 2006
Oak – Oakland, August 30, 2006
LB – Long Beach – September 1, 2006

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*Mtg. = meeting locations
Sac – Sacramento, August 28, 2006
Oak – Oakland, August 30, 2006
LB – Long Beach – September 1, 2006

2004 Draft Plan Process

The first draft of the AIS management plan included the valuable input of many dedicated individuals with expertise on a wide variety of topics relating to AIS in California and the region. Contributors ranged from local, state and federal agencies, to industry representatives, NGOs and other stakeholders.

Funding for the development of the first draft was provided by the DFG and USFWS. Susan Ellis, the Statewide Invasive Species Coordinator, developed a contract with the University of California, Davis, to develop an Aquatic Invasive Species Plan following the general outline provided by the Aquatic Nuisance Species Task Force. Ted Grosholz was the Principal Investigator for the contract. The deliverables for the contract included facilitated meetings to ensure that agency and stakeholder input was incorporated in the Plan.

In August of 2002, representatives of 14 agencies with a role in managing aquatic invasive species came together to participate in a State AIS Planning Workshop in Davis, CA. Results of that meeting included a draft set of goals and objectives for an AIS Plan and a brief summary of current AIS activities for some of the participating agencies. There was agreement that a state plan could help identify AIS of concern, and provide a framework for how to address AIS prevention, eradication, research, management and education and outreach in a more coordinated and comprehensive fashion.

Additional information for the plan was gathered from other state and federal plans, various websites, published papers, internal agency documents and through personal communication (phone and email).

The Plan's Review Committee (members listed below) commented on a first draft of the plan, which was then distributed to a broader group of Agency reviewers and for public review.

Review Committee for the 2004 Draft Plan

Lars Anderson, United States Department of Agriculture, Agricultural Research Service
Robert Leavitt, California Department of Food and Agriculture
Dale Steele, California Department of Fish and Game
Mark Sytsma, Portland State University
Erin Williams, United States Fish and Wildlife Service

Participation by Other Agencies and Groups

Courtney Albrecht, California Department of Food and Agriculture
Marcia Carlock, California Department of Boating and Waterways
Marina Carzola, California Coastal Commission
Jason Churchill, Lahontan Regional Water Quality Control Board
Nate Dechoretz, California Department of Food and Agriculture
Joseph DiTomaso, University of California, Davis
Maurya Falkner, California State Lands Commission
Connie Ford, State Water Resources Control Board
Joann Furse, California Sea Grant
Eric Gillies, California State Lands Commission
Bob Hoffman, National Marine Fisheries Service
Christina Johnson, California Sea Grant
Jaime Kooser, California Coastal Commission
Steve Lonhart, Monterey Bay National Marine Sanctuary
Karen McDowell, California Sea Grant
Cindy Messer, California Department of Water Resources
Julie Owen, California Department of Boating and Waterways
Bill Paznokas, California Department of Fish and Game
Stephen Phillips, Pacific States Marine Fisheries Commission
Carolyn Pizzo, U.S. Department of Agriculture

Jim Rains, California Department of Food and Agriculture
Steve Schoenig, California Department of Food and Agriculture
Jody Sears, California Department of Water Resources
Linda Sheehan, Pacific Regional Office, The Ocean Conservancy
Basia Trout, Bureau of Reclamation
Tanya Veldhuizen, California Department of Water Resources
Kim Webb, United States Fish and Wildlife Service
Katherine Zaremba, Invasive Spartina Project

2002-2003 Stakeholder Meeting Comments

Incorporating recommendations from a broad array of stakeholders contributes to a better and more responsive AIS plan for the State of California. In an effort to get input on concerns and perspectives regarding AIS during the plan's development, scoping meetings were held to get input from many organizations, businesses, industry representatives and individuals. A northern California stakeholder meeting was held in Sacramento on November 19, 2002. A southern California stakeholder meeting was held on March 20, 2003. Participants provided valuable comments, most of which have been incorporated into the management plan.

Northern California Stakeholder Comments

Invitations were sent to over 200 individuals and included representatives of many industries including the pet, aquarium, and nursery/landscaping trades, live bait and seafood dealers, and ports and marinas. The following individuals attended:

Drew Alden, Growers in Tomales Bay
John Berg, Pacific Merchant Shipping Association
Thomas Confal, IPM Specialist, Bitterroot Restoration, Inc.
John Cruger-Hansen, Harbor Master, City of Antioch
Daniel Garcia, Public Affairs, Marine Aquarists Roundtable of Sacramento
Jeff Hart, President, Habitat Assessment and Restoration Team, Inc.
James Kidder, President, Colombo Bait, Inc.
Karen McDowell, Project Coordinator, West Coast Ballast Outreach Project
James Mills, Vice President and Regional Manager, Westree Marinas
Fleur O'Neill, Policy Education Coordinator, Save Our Shores
John O'Sullivan, Curator of Field Operations, Monterey Bay Aquarium
Roger Phillips, Applied Research Manager, Monterey Bay Aquarium
Kirsten Upson, The Nature Conservancy
M.K. Veloz, Administrative Director, Northern California Marine Association

Mike Fraidenburg of Dynamic Solutions Group of Olympia, Washington facilitated the meeting. Susan Ellis (State Invasive Species Coordinator) explained the different roles and responsibilities of state agencies and current management activities for aquatic invasive species in California. Ted Grosholz (UCD) and Holly Crosson (UCD) discussed the process for the plan's development including future stakeholder and agency meetings as well as the current status of the plan. Mark Sytsma (Portland State University, Portland, Oregon) discussed Oregon's experience with writing a state management plan for aquatic invasive species as well as the uses and limits of state plans. The rest of the meeting was spent listening to concerns and suggestions presented by the stakeholders. Most of the comments could be divided into the categories of Education, Prevention, Best Management Practices, Regulation, State Invasive Species Council and General AIS Management Plan development suggestions.

EDUCATION

- Education about AIS should be a top priority.
- Educational tools should be used instead of legislation and regulations.
- A list of AIS experts should be made available to stakeholders.

- AIS information should be available at all bait shops, marinas, boat access areas, etc.
- It may take 20 years, but *all* of the public needs to be educated about AIS (example used was educational programs for dealing with issues such as recycling, littering, etc.).
- The public needs to know why they should care about AIS (i.e., the consequences of invasions).
- The public as well as industry needs to know the economic cost of AIS (cost/benefit analysis).
- Stakeholders are a resource and can help with education, such as public service announcements.
- Multiply educational efforts by identifying what industry sectors can do to help with AIS education and outreach (i.e., using Wal-Mart, Home Depot, PetSmart etc. to educate their customers about AIS).
- A database is needed that focuses on providing information about AIS outreach, education and research-based grants. Information on who is doing what on AIS should also be available and include efforts by NGO's, universities and industry.
- AIS hazards that exist in particular areas need to be identified and publicized before they spread.
- Cross-education between interest groups and government would help understanding of the issues and concerns for both groups.
- Education in the K-12 classroom is important; biologists should go into schools to talk about AIS.
- Aqua-culturists need current information to help avoid AIS introduction problems of the past.
- There should be guidelines developed to help groups "self-police" and educate their constituents.
- Coordination needs to be improved between state, regional and federal groups.
- Identify all educational and technical resources currently available and make them easily accessible.
- Identify where the information gaps are.

PREVENTION (including Early Detection and Rapid Response)

- A Rapid Response program requires extensive coordination but is critical.
- An AIS "hotline" is needed so new sightings can be reported immediately.
- Management of introduction pathways is important for AIS prevention.
- We should have the ethic of not transporting California's AIS elsewhere; include this in the plan.
- The largest percentage of funds should be spent on prevention since it is the most cost-effective.
- Early detection is key to successful AIS eradication and management.
- Each vector/pathway that is identified in the plan should have a lead agency listed as well as a stakeholder group.
- Look into whether funds from anti-terrorism sources could be tapped into (i.e. to address the intentional introduction of a devastating foreign, water-borne organism).

BEST MANAGEMENT PRACTICES (BMPs)

- Each industry should be actively involved in the development of the BMPs that relate to them.
- BMPs can be a tool for industry to understand and meet their obligations.
- Consider using a neutral third party or group (scientific panel) to offer advice and develop recommendations for BMPs instead of leaving development to agencies or industry alone.
- Investigate how "management" of a landscape (or lack thereof) affects the likelihood of invasion.

REGULATION

- The public and industry need to have an understanding of AIS laws and their history before they go into effect.
- We need more education and outreach on laws already passed so the public can abide by them.
- AIS laws and penalties need to be publicized in the DFG regulations right up front.
- Regulatory agencies need to "get on the same page"; inconsistencies confuse the public.
- There should be more opportunity for stakeholder input when new regulations are being written, especially when livelihoods are at stake (*Caulerpa* in southern California was example used).
- A patchwork of regulations makes coordination between state, regional and federal levels difficult.

- Inter-jurisdictional coordination needs improvement to make compliance easier.
- Guidelines need to be developed for meeting NPDES permit requirements.
- A process needs to be developed to authorize within-state transfer of approved live aquatic species.
- Laws, regulations and permits need to be more clear, consistent and effective.
- Enforcement needs to be more vigilant and consistent.
- Stakeholder input should be solicited when permitting procedures are being written.
- New legislation should be written with the help of stakeholders (ballast water example was used).
- Methods for complying with aquaculture regulations need to be clearer.
- Some stakeholders feel like they are working in a vacuum; they need guidelines to help them determine if the right thing is being done.
- Develop a mechanism for mandatory reporting of listed AIS.
- Make sure regulations that affect industry are feasible (shipping example was used).
- Use existing Department of Boating and Waterways (DBW) laws to make AIS introductions illegal.
- Create a single, central clearing house for information on all AIS laws and regulations.

STATE AQUATIC INVASIVE SPECIES COUNCIL (ISC)

- The ISC needs to have broader public representation; consider expanding it to include more stakeholder groups.
- Each industry should decide who will represent them on the ISC.
- The number of industry representatives should be equal to or higher than the number of government representatives on the ISC.
- DBW should not represent all boating interests on the ISC.

GENERAL AIS MANAGEMENT PLAN DEVELOPMENT

- Make the plan short and simple.
- Funding priorities in the plan should be delineated by the ISC or another representative group.
- Work together; don't have government on one side and resource users on the other.
- Stakeholders are interested in practical solutions.
- Use common names in addition to scientific names for AIS to make the plan more user-friendly.
- Limit use of acronyms or fully explain them.
- Prioritization of species within the plan is necessary.
- Develop a system to prioritize aquatic invasive species using the ISC or another representative group.
- Use assigned "Management Classes" as Oregon did rather than prioritizing species.
- Consider using DFA's ABC List of Noxious Weeds as a model.
- Develop a process to determine which method gets used to control or eradicate a species.
- Limit administrative overhead.
- Develop a process to resolve disputes.
- Make sure all groups are represented (include tribes, irrigation districts, bass anglers, boaters, etc.).
- The planning effort should take into account the target species as well as the environment.
- There is a concern that some may try to sidetrack the plan or use the plan to push their own agenda.
- Consider using AIS instead of ANS (the word "invasive" is perhaps better than "nuisance").
- Write into the plan that state and federal agencies coordinate through formal written agreements.
- High profile species should not take over concern for lesser-known problem species.
- Support for current AIS programs should be continued.
- Make sure limited resources go to on-the ground projects rather than getting lost in the bureaucracy.

Southern California Stakeholder Comments

Invitations were sent to over 450 individuals and included representatives of local water agencies and irrigation districts, tribes, various industries including the pet, aquarium, aquaculture and nursery/landscaping trades, live bait and seafood dealers, ports, marinas and shippers, and others with an interest in aquatic invasive species. The following individuals attended:

Douglas Ball, Los Angeles Department of Water and Power
Mark Baumann, Live Cargo Reptile and Fish/ San Diego Fish Society
Paul Brown, Project Analyst, Port of San Diego
Thomas Buckowski, Lake Biologist, Lake Mission Viejo Association
Larry Chapp, Vice President, Divisional Merchandise Manager, PETCO
Hugh Cobb, Pacific Coast Bait and Tackle
Tom Gass, Manager, El Pescado Caliente
Chris Graham, Lake Biologist, Lake Mission Viejo Association
Miguel Hernandez, Watermaster, Natural Resources Office, Pauma Band of Mission Indians
Annaliese Hettinger, The Diving Locker
Steve Lonhart, Monterey Bay National Marine Sanctuary
Marshall Meyers, Executive Vice President, Pet Industry Joint Advisory Council
Craig Parsons, Live Fish, Reptile, Bird and Small Animal Buyer, PETCO
Russell Moll, Director, California Sea Grant/ Scripps Institute of Oceanography (SIO)
Anandra Ranasinghe, Southern California Coastal Water Research Project
Freda Reid, San Dieguito Lagoon Committee and Research Associate (SIO)
Andi Shluker, The Nature Conservancy of Hawaii
Ed Smith, General Manager, Palo Verde Irrigation District

Mike Fraidenburg of Dynamic Solutions Group (DSG) of Olympia, Washington facilitated the meeting. Ted Grosholz (UCD) discussed the ecological and economic costs of aquatic invasive species and introduced the goals and purpose of the meeting. Susan Ellis (State Invasive Species Coordinator) explained the different roles and responsibilities of state agencies and current management activities for aquatic invasive species in California, and provided an update on the formation of the California Aquatic Invasive Species Council. Mark Sytsma (Portland State University, Portland, Oregon) discussed Oregon's experience with writing a state management plan for aquatic invasive species as well as the uses and limits of state plans. Holly Crosson (UCD) discussed the process for the California plan's development and progress on the plan thus far. The rest of the meeting was spent discussing concerns and suggestions presented by the stakeholders. Most of the comments could be divided into the categories of Education, Prevention, Best Management Practices, Regulation and General AIS Management Plan development. Below is a summary of specific comments made under each of these categories.

EDUCATION

- A comprehensive strategy for AIS Education and Outreach should be developed.
- Education should be used instead of new legislation and regulation.
- More AIS information needs to reach the public, retail stores, industry, schools, etc.
- Prioritize educational efforts based on risk associated with a given pathway.
- Piggyback onto current Agency educational programs.
- Consider "green labeling" to help consumers make the right choice; peer pressure will encourage appropriate behavior/decisions of others.
- Educational efforts need to take into account the multi-cultural nature of CA (signs, etc. need to be published in other appropriate languages besides English).
- Marketing experts should be used to get a single, common AIS message out across the region.
- The AIS message has to touch people personally (an impact on the quality of life or the pocketbook).
- Educational materials should be tailored to specific industry sectors (aquaculture, boaters, bait shops, pet/aquarium retailers, etc.).

- The public as well as industry needs to know the economic cost of AIS (pay now or pay more later).
- Stakeholders are a resource and can help with educational efforts (i.e., using Recreational Fisherman's Alliance, American Sportfishing Association, Diving or Tropical Fish Clubs, etc.).
- Multiply educational efforts by identifying what industry sectors can do to help with AIS education and outreach; partner with pet/aquarium and other industries.
- Develop better ways to get the AIS message out, for instance, don't just have a booth at trade shows but work directly with promoters of shows (example – Fred Hall Show).
- Publish articles in Western Outdoor News and similar magazines.
- Train people to use the AIS "Traveling Trunk" and have them take it "on the road".
- A comprehensive AIS species list should be developed and publicized with appropriate contacts listed for experts associated with each species.
- There should be guidelines developed to help groups "self-regulate" and educate their constituents.

PREVENTION (including Early Detection and Rapid Response)

- An AIS Prevention Program is key to success but is not foolproof.
- AIS Screening and Risk Assessment Programs should not be overly simplistic or arbitrary. They need to be based on the best available information and sound science.
- Volunteers can be an important piece in monitoring efforts for early detection of AIS.
- Training volunteers takes a lot of organization and keeping them motivated over the long term can be challenging
- Interaction with Watershed Councils is important.
- An AIS "hotline" is needed so new sightings can be reported immediately.
- Determine the economic consequences of pathway prevention.
- Look into funds available through "homeland security".

BEST MANAGEMENT PRACTICES (BMPs)

- Develop guidelines for acceptable, humane and environmentally safe ways to deal with unwanted aquatic organisms (whether it be proper disposal, returning the organism to the retailer, or being "adopted" by someone else).
- Industry and individuals need to accept a degree of economic liability and responsibility for their actions regarding AIS introduction and spread.
- Create industry standards to regulate and penalize the bad actors.
- Each industry should be actively involved in the development of their own BMP's. Weak industry initiative yields weak BMPs.
- Industry documentation is needed to support accountability.
- Determine if BMPs should be regulatory.
- Develop BMPs for Bass Tournaments.
- BMPs need to maintain some flexibility and an acknowledgement that "one size does not fit all".
- BMPs can help achieve buy-in, create institutional memory, give an outsider a way to monitor activities and are already an accepted process in industry (similar to ISO example).

REGULATION

- Enforce the laws and regulations we already have, rather than pass new ones.
- Provide positive incentives to encourage self-regulation.
- Provide better information about what AIS laws are currently in place and how to comply with them.
- A few bad apples are causing regulatory problems for all involved.
- Determine more effective ways to catch violators of current laws, including interstate transport.
- Improve current regulations. Piranhas and snakeheads were used as examples of species that are regulated but still are imported and released. We should learn from these experiences and attempt to prevent similar situations.

GENERAL AIS MANAGEMENT PLAN DEVELOPMENT

- Coordinate with the National Marine Sanctuaries on Plan development.
- Work with California Sea Grant to achieve success in plan implementation, especially with education and outreach strategies and actions.
- Be creative with funding and partnerships.
- Leverage resources by doubling up on surveys, inspections, etc. that are already being done.
- Continually evaluate and update the plan and make sure the plan's goals are being realized (develop a scorecard).
- Make sure the functioning of the California Aquatic Invasive Species Council is evaluated so it does not outlive its useful purpose. If changes are needed to make the council more effective, they should be able to be promoted through other agencies and the general public.
- Take steps to minimize the loss of dollars through overhead.
- Do not set the stage for failure by creating a timeline that cannot be met.
- Involve economists if possible (can a dollar figure be put on habitat/resources?).
- Make it clear who will determine priorities in the plan and what gets funded.
- Incorporate Watershed Councils in the planning effort.
- Make the relationship between the plan and AIS policy clear.
- Determine how plan implementers will interact with on-the-ground managers.
- Write the plan so that it facilitates funding for implementation. The plan should be user-friendly.
- Plans should promote accountability so that managers have an incentive to perform and meet commitments.

APPENDIX F: EXECUTIVE SUMMARY OF *BIOLOGICAL INVASIONS: RECOMMENDATIONS FOR U.S. POLICY AND MANAGEMENT*

Position Paper of the Ecological Society of America

Biological Invasions: Recommendations for U.S. Policy and Management

David M. Lodge, Susan L. Williams, Hugh MacIsaac, Keith Hayes, Brian Leung, Sarah Reichard, Richard N. Mack, Peter B. Moyle, Maggie Smith, David A. Andow, James T. Carlton and Anthony McMichael, 2006

Executive Summary

The spread of nonindigenous (non-native) species introduced into the United States is a significant and growing national problem, costing taxpayers hundreds of billions of dollars in environmental degradation, lost agricultural productivity, increased health problems and expensive prevention and eradication efforts. Some nonindigenous species are introduced intentionally and are highly valued by humans, e.g., agriculture, aquaculture, and ornamental species. Many other species are introduced as by-products of human activity, especially through the increasing global transportation of humans and commercial goods. A subset of introduced species spread widely, become abundant and cause harm. The definition of "harm" is a function of human values, which often differ in different regions and may change temporally. Nevertheless, harm is often unambiguous and the species from elsewhere that causes harm are referred to as invasive nonindigenous species. They are the focus of policy and management concern because of their serious and complex contributions to diseases of plants, animals and humans; reductions in native species; changes in ecosystem function; and financial losses.

Well known examples of invasive nonindigenous species include the vine kudzu (*Pueraria lobata*) in the southeastern U.S., cheat grass (*Bromus tectorum*) in the western U.S., and zebra mussel (*Dreissena polymorpha*) in the central U.S. More recent arrivals with large net negative impacts on the environment, agriculture, forestry, industry and human health include West Nile virus, the seaweed *Caulerpa* (*Caulerpa taxifolia*), Asian long-horn beetle (*Anoplophora glabripennis*), emerald ash borer beetle (*Agrilus planipennis*), sudden oak death (*Phytophthora ramorum*), monkeypox virus, and the SARS virus. Without management, the populations of these species grow and spread such that damages accelerate over time. In contrast to many other forms of pollution, such widespread invasions become irreversible because the technology often does not exist to selectively eradicate species. Relative to the economic and ecological costs of other forms of environmental pollution, the costs of nonindigenous species are therefore of particular concern because they are likely to be borne over very long time frames.

Despite the great diversity of invasive species and their impacts, an identified group of pathways transport species, and a common set of biological processes – introduction, establishment, spread, and impact – operate in all invasions. Policy and management solutions become clearer when these common pathways and processes are recognized. Nevertheless the possible management responses diminish as any invasion progresses. Prevention is possible only before a species arrives or at the point of entry. Thereafter, a narrow window of opportunity for eradication exists before some species spread so widely that it is impossible or infeasible to locate and kill all populations. Once a species is too widespread for eradication, only three management options remain: controlling populations in selected locations; active mitigation of impacts; or simply bearing the cost of the changes caused by the invader. U.S. policy, often by default, has largely adopted the last option, i.e., acceptance of often irreversible environmental and economic damage.

The only study to attempt a nationwide estimate of the economic costs to the U.S. of nonindigenous species concluded that annual costs exceed $120 billion (Pimentel et al. 2005), which

we regard as an underestimate because the majority of invasive species were not included in the study. Even this underestimate equates to costs of $1,100 per U.S. household per year, costs that will continue to grow unless prevention and management of invasive species improves. Yet, the U.S. has allowed invasions to continue and damages to increase.

A more cost-effective approach would include greater investments in prevention and other active management steps, including early detection, eradication and control. Recent scientific advances in our understanding of biological invasions make it clear that more effective options exist for these threats. Here, on behalf of the Ecological Society of America, we make six recommendations for government action that, if implemented, would substantially reduce the current and future damages to the U.S. from invasive species. We include proposals for cost-effective government actions that will address these problems with the understanding that other measures are important to complement governmental responses. Key challenges that require urgent government action include prevention, detection, eradication and control of harmful non-native species, and the coordination of these efforts at the state, federal and international levels. Table 1 summarizes the major recommendations, data and techniques for implementation, and proposed lead organizations.

Prevention

Recommendation 1. Use a combination of existing and new technologies, education strategies, industry codes of conduct, and government oversight to prevent introductions from pathways that already are well known to be major sources of nonindigenous species, and to monitor other pathways into the United States to better assess the degree of risk they pose.

Recommendation 2. Screen live organisms proposed for importation into the U.S. for environmental, economic and human health risk before a decision is made to allow entry. Risk analysis tools should be repeatable, transparent, supported by current scientific findings and applied to all pathways, across all agency jurisdictions.

Early Detection, Eradication and Control

Recommendation 3. Use new technology to improve active surveillance of invasive species to increase the success of rapid response and eradication efforts, in cooperation with existing web-based information networks in universities, herbaria, museums and state agencies.

Recommendation 4. Make legal authority and emergency funding available for eradication and control to proceed rapidly once a newly established potentially invasive species is detected. Current legal mechanisms and funding for responses to agricultural pests and parasites, and to human pathogens, should be extended to all potentially invasive species in all habitats, and employed commensurate with the threat.

Recommendation 5. Provide on-going funding and incentives for slowing the spread of established invasive species on public and private lands, in cooperation with the states and tribal governing bodies.

Establishing a National Center for Invasive Species Management

Recommendation 6. Expand existing authority of the National Invasive Species Council (NISC), including the establishment of a National Center for Invasive Species Management under NISC, to better coordinate policies among government agencies and with other countries. Current U.S. examples of intergovernmental cooperation include the National Interagency Fire Center and the Center for Disease Control and Prevention. Unless these or conceptually similar recommendations are adopted, the rate of damages to our environment, economy and health caused by invasive species will accelerate. These damages are spread across many stakeholders, and no strong, nationwide group has emerged to encourage industries that are pathways of introduction to reduce the threat. Hence the federal government must assume greater leadership to coordinate efforts by all

levels of government. We recognize that the problem is complex and interdisciplinary, includes many pathways, a tremendous diversity of organisms that are invasive, and the vulnerability of all terrestrial, marine and freshwater ecosystems. Despite this complexity, and the consequent overlapping and sometimes conflicting state, federal and international policies involved, the six recommendations described in this paper provide sound guidance for the future. Recent scientific and interdisciplinary advances provide a strong basis for rapid implementation of these cost-effective solutions.

APPENDIX G: LIST OF REGULATED SPECIES IN CALIFORNIA

Aquatic invasive species are regulated by a number of state and federal regulations. The aquatic plant and animal species restricted in California, and the regulations that apply to each, are listed below.

ANIMALS

In California, the animal species considered detrimental to native wildlife, state agriculture or public health and safety are listed in California Administrative Code Title 14, Section 671. Importation, transportation and possession of the restricted animals on this list are unlawful except under permit issued by the California Department of Fish and Game. Animal species restricted by the federal government are considered "injurious wildlife" and named in the Lacey Act (50 CFR 16.11-16.15). The U.S. Fish and Wildlife Service has responsibility for regulating the live importation or shipment of these animals.

California's list of Restricted Animals
http://www.dfg.ca.gov/licensing/pdffiles/fg1518.pdf
Click on the following link: "Search for a Specific Regulatory Section"
Title: 14
Section: 671

Injurious Wildlife Species List (PDF)
U.S. Fish and Wildlife Service
http://www.invasivespeciesinfo.gov/laws/main.shtml

PLANTS

Certain aquatic invasive plants are listed as Noxious Weed Species in Title 3, Section 4500 of the California Administrative Code. Their eradication, control, and containment are regulated by the California Department of Food and Agriculture (DFA). Each species has been given a "pest rating" based on the economic risks it poses to the state. In addition, Division 3, Chapter 3.5, Section 2300 of the California Fish and Game Code restricts all species of the marine alga genus *Caulerpa*. Federally restricted invasive plants are listed in Noxious Weed Act P.L. 93-629.

CDFA Weed List
http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/pdfs/noxiousweed_ratings.pdf

Federal Noxious Weed List (PDF)
http://www.aphis.usda.gov/ppq/weeds/weedlist2006.pdf

Appendix G
State and/or Federal Regulated Aquatic Invasive Animals

Scientific Name	Common Name	Group	Habitat	Regulated By
Mustelidae (Family)	All species except *Amblonyx cinerea*, Oriental small-clawed otter, *Aonyx capensis,* African clawless otter*, Pteronura brasiliensis,* giant otter and all species of genus *Lutra,* river otters.	Mammals	F	CA
Amiidae (Family)	bowfins	Fish	F	CA
Anguilla (Genus)	freshwater eels	Fish	F	CA
Aplodinotus grunniens (Species)	freshwater drum	Fish	F	CA
Astyanax fasciatus (Species)	banded tetra	Fish	F/B	CA
Belonesox belizanus (Species)	pike killifish	Fish	F	CA
Carcharhinus (Genus)	freshwater sharks	Fish	F	CA
Cetopsidae (Family)	whalelike catfishes	Fish	F	CA
Channidae (Family)	snakeheads	Fish	F	CA, US
Clariidae (Family)	labyrinth catfishes	Fish	F	CA*,US
Ctenopharyngodon idella (Species)	grass carp (permits may be issued for possession of triploid grass carp)	Fish	F	CA
Cyprinodon variegatus (Species)	sheepshead minnow	Fish	F/B	CA
Dorosoma cepedianum (Species)	gizzard shad	Fish	F	CA
Esocidae (Family)	pikes	Fish	F	CA
Heteropneustidae (Family)	airsac catfishes	Fish	F	CA
Hoplias malabaricus (Species)	tiger fish	Fish	F/B	CA
Hypophthalmichthys molitrix (Species)	silver carp	Fish	F	CA
Hypophthalmichthys nobilis (Species)	bighead carp	Fish	F	CA
Ictiobus (Genus)	buffalo suckers	Fish	F/M	CA
Lepisosteidae (Family)	gars	Fish	F	CA
Leuciscus idus (Species)	Ide	Fish	F	CA
Morone americana (Species)	white perch	Fish	F	CA
Morone chrysops (Species)	white bass	Fish	F	CA
Perca flavescens (Species)	yellow perch	Fish	F	CA
Potamotrygonidae (Family)	river stingrays	Fish	F/M	CA
Petromyzontidae (Family)	lampreys - all nonnative species	Fish	F/M	CA
Salmo salar (Species)	Atlantic salmon - restricted in the Smith River watershed	Fish	F/M	CA

* Only members of the Clarias, Dinotopterus, and Heterobranchus genera are prohibited by Title 14 section 671

Key

B	Brackish	CA	CDFG Restricted Species, Title 14, Section 671
F	Freshwater	US	USFW Lacey Act 50 CFR 16.11-16.15
M	Marine		

Appendix G
State and/or Federal Regulated Aquatic Invasive Animals

Scientific Name	Common Name	Group	Habitat	Regulated By
Salmonidae (Family)	live or dead uneviscerated salmonid fish, live fertilized eggs, or gametes of salmonids are prohibited unless accompanied by a certification that the ensures they are free of *Onocorhynchus masou* virus and the viruses causing viral hemorrhagic septicemia and infectious hematopoietic necrosis, and meet the conditions in 50 CFR 16.13	Fish	F/M	US
Serrasalmus (Genus)	piranhas (including genera Pygocentrus and Pygopristis, and invalid genera Serrasalmo, Taddyella, Rooseveltiella)	Fish	F	CA
Stizostedion vitreum (Species)	walleye	Fish	F	CA
Tilapia aurea (Species)	blue tilapia	Fish	F/M/B	CA
Tilapia nilotica (Species)	Nile tilapia	Fish	F/M/B	CA
Tilapia sparrmani (Species)	banded tilapia	Fish	F/M/B	CA
Tilapia zillii (Species)	redbelly tilapia (permits may be issued to a person or agency for importation, transportation, or possession in the counties of San Bernardino, Los Angeles, Orange, Riverside, San Diego, and Imperial)	Fish	F/M/B	CA
Trichomycteridae (Family)	parasitic catfishes	Fish	F	CA
Ambystoma (Genus)	tiger salamanders	Amphibian	F	CA
Bufonidae (Family)	toads (including *Bufo marinus,* cane toad, giant toad or marine toad; and invalid species, *Bufo paracnemis,* Cururu toad, and *Bufo horribilis,* other large toads from Mexico and Central and South America)	Amphibian	F/M	CA
Xenopus (Genus)	clawed frog	Amphibian	F	CA
Crocodilia (Order)	crocodiles, caimans, alligators and gavials	Reptile	F/M	CA
Chelydridae (Family)	snapping turtles	Reptile	F	CA
Cambaridae (Family)	crayfish - all species except *Procambarus clarkii* and *Orconectes virilis*	Invertebrate	F/M	CA
Eriocheir (Genus)	crabs	Invertebrate	F/M	CA, US
Dreissena (Genus)	zebra and quagga mussels	Invertebrate	F	CA, US **
Potamopyrgus antipodarum (Species)	New Zealand mudsnail	Invertebrate	M	CA
Transgenic Aquatic Animals	Freshwater and marine fishes, invertebrates, crustaceans, mollusks, amphibians and reptiles		F/M	CA

** Only the species Dreissena polymorpha is prohibited by the Lacey Act

Key

B	Brackish	CA	CDFG Restricted Species, Title 14, Section 671
F	Freshwater	US	USFW Lacey Act 50 CFR 16.11-16.15
M	Marine		

Appendix G
State and/or Federal Regulated Aquatic Invasive Animals

Scientific Name	Common Name	Habitat	Applicable Regulations/Pest Rating
Alternanthera philoxeroides	alligatorweed	F	A
Arundo donax	giant reed	W/U/R	B
Azolla pinnata	mosquito fern, water velvet	F	US
Cabomba caroliniana	fanwort	F	Q
Caulerpa taxifolia	Caulerpa	M	US, DFG
Caulerpa cupressoides	Caulerpa	M	DFG
Caulerpa mexicana	Caulerpa	M	DFG
Caulerpa sertulariodes	Caulerpa	M	DFG
Caulerpa floridana	Caulerpa	M	DFG
Caulerpa ashmeadii	Caulerpa	M	DFG
Caulerpa racemosa	Caulerpa	M	DFG
Caulerpa verticillata	Caulerpa	M	DFG
Caulerpa scapelliformis	Caulerpa	M	DFG
Eichhornia azurea	anchored water hyacinth	F	US
Hydrilla verticillata	hydrilla	F	US, A
Hygrophila polysperma	Miramar weed	F	US
Ipomoea aquatica	Chinese water spinach	F	US
Lagarosiphon major	oxygen weed	F	US
Limnobium spongia	spongeplant	F	Q
Limnophila indica	ambulia	F	Q
Limnophila sessiliflora	ambulia	F	US, Q
Lythrum salicaria	purple loosestrife	W/U	B
Melaleuca quinquenervia	broadleaf paper-bark tree	W	US
Monochoria hastata	monochoria	F	US
Monochoria vaginalis	heartshape false pickerelweed	F	US
Nymphaea mexicana	banana water lily	F	B
Ottelia alismoides	duck lettuce	F	US
Pistia stratiotes	water lettuce	F	B
Polygonum amphibium	swamp smartweed	F	C
Polygonum cuspidatum	Japanese knotweed	W/U/R	B
Sagittaria sagittifolia	arrowhead	F	US
Salvinia auriculata	salvinia	F	US, A
Salvinia biloba	salvinia	F	US, A*
Salvinia herzogii	herzog salvinia	F	US, A*
Salvinia molesta	giant salvinia	F	US, A*
Sparganium erectum	exotic bur-reed	F	US
Tamarix chinensis	Chinese tamarisk	U/R	B
Tamarix gallica	French tamarisk	U/R	B
Tamarix parviflora	smallflower tamarisk	U/R	B
Tamarix ramosissima	salt cedar	U/R	B

*DFA considers these species a synonym of Salvinia auriculata

Appendix G
State and/or Federal Regulated Aquatic Invasive Animals

Key for State and/or Federally Regulated Aquatic Invasive Plants

DFG	Regulated by CDFG Division 3, Chapter 3.5, Section 2300
F	Freshwater
M	Marine
R	Riparian
SM	Saltmarsh
U	Upland
US	**Regulated by the Federal Noxious Weed Act, P.L. 93-629.** For more details, see the discussion of the Noxious Weed Act in the subsection titled "Other Federal Authorities" in Appendix B of the California Aquatic Invasive Species Management Plan..
W	Wetland

Noxious Weed Ratings per California Department of Food and Agriculture Plant Industry Policy Letter 89-2, May 1, 1989. http://www.cdfa.ca.gov/cdfa/pendingregs/docs/PlantPestRatings.pdf

A	An organism of known economic importance subject to enforced action involving eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state.
B	An organism of known economic importance subject to eradication, containment, control or other holding action at the discretion of the commissioner. OR an organism of known economic importance subject to state holding action and eradication only when found in a nursery.
C	An organism subject to state endorsed holding action and eradication only when found in a nursery; action to retard spread outside of nurseries at the discretion of the commissioner; reject only when found in a cropseed for planting or at the discretion of the commissioner.
Q	An organism requiring a temporary "A" action pending determination of a permanent rating. It is suspected to be of economic importance, but its status is uncertain because of incomplete identification or inadequate information.
D	Organisms determined to be of little or no economic importance

Inhibition of Giant Kelp Recruitment by an Introduced Brown Alga

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Inhibition of Giant Kelp Recruitment by an Introduced Brown Alga

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Abstract

Following a natural disappearance of the native giant kelp *Macrocystis pyrifera*, an invasion of the introduced brown alga *Sargassum muticum* appeared to prevent giant kelp recruitment. Experimental removal of adult *S. muticum* resulted in a significant increase in giant kelp recruitment compared to nonremoval areas. Two requirements for the successful establishment of giant kelp appeared to be: 1) an absence of *S. muticum*, and 2) the presence of nearby giant kelp adults to supply sufficient spores. Higher densities of giant kelp in removal areas persisted throughout the period when *S. muticum* dies back to a perennial holdfast. Shading at a critical time in the giant kelp life cycle is suggested as a possible mechanism for the inhibition of giant kelp recruitment.

Introduction

The large kelps (Phaeophyta, Laminariales) comprise the majority of the subtidal canopy algal species in temperate marine communities (Mann 1973). Their ecological importance has long been recognized (Darwin 1860, North 1971). Dayton (1975) and Hruby (1976) have found that recruitment, growth, and development of several laminarians can be inhibited by competition with native algal species. In this paper, we examine the interactions between the introduced brown alga *Sargassum muticum* (Yendo) Fensholt (Order Fucales) and the native giant kelp *Macrocystis pyrifera* (L.) C. A. Agardh.

Sargassum muticum was introduced to the west coast of North America from Japan in the late 1940's (Scagel 1956). Initially restricted to the Pacific Northwest, it spread southward to Baja California by 1971 (Setzer and Link 1971) and was found for the first time in England in 1973 (Farnham, Fletcher and Irvine 1973). In spite of the rapid invasion of *S. muticum* and speculation of its potential influence on algal communities (Druehl 1973, Jones and Farnham 1973, Farnham and Jones 1974, Fletcher and Fletcher 1975, Norton 1976), its actual impact on native algae has not been studied. Our evidence suggests that *S. muticum* inhibits recruitment of the giant kelp *Macrocystis pyrifera* on Santa Catalina Island, California, USA.

Prior to 1976, a very dense bed of *M. pyrifera* existed near the east end of Bird Rock, a small island near Santa Catalina Island. This kelp bed, along with many others at Santa Catalina Island, disappeared in the summer of 1976 (see Coyer 1979). Elevated temperatures from mid-June to November 1976 at Santa Catalina (Coyer 1979) were the probable cause of the decline, since kelp beds in southern California deteriorate when water temperatures exceed 20 °C (North 1971, Abbott and North 1972). During the following winter, *S. muticum* appeared in high densities at Bird Rock for the first time, ultimately covering the entire east end. Even though *S. muticum* dies back to a perennial holdfast in early summer and does not resume vegetative growth until fall (Ambrose and Nelson, pers. obs.), there was essentially no *M. pyrifera* recruitment at Bird Rock in 1977 or 1978. Kelp abundance in other Santa Catalina kelp beds, where *S. muticum* had not become established, increased to predecline levels by August 1977 (Coyer 1979). These observations suggested that *S. muticum* might have been preventing the re-establishment of *M. pyrifera* at Bird Rock. We cleared several areas of *S. muticum* in 1979 to examine the possibility that *S. muticum* inhibited *M. pyrifera* recruitment.

Methods

Research was conducted near the east end of Bird Rock, a small island 0.5 km N of Big Fisherman's Cove on Santa Catalina Island (33° 27′ N, 118° 29′ W), 30 km S of Los Angeles, California, USA. The study site depth varies from 3 to 7 m below MLLW. Water temperature varies from 12°–14 °C in the winter to 20°–22 °C in the summer.

Sargassum muticum was removed by pulling up individual plants by hand along a corridor 2 m wide; no at-

0006-8055/82/0025-0265$02.00

tempt was made to remove the perennial holdfast. Two areas were studied. Area 1 removal (15 m long) and its control (13 m long) were 2 m and 4 m away from a sharp dropoff to approximately 30 m ("the wall"), respectively. *Sargassum muticum* does not extend onto the wall, where many *Macrocystis pyrifera* persist. In Area 2 there were two removal areas (a and b) and one control, each 10 m long and located 13 m away from the wall. Removal areas were cleared monthly from January to June 1979, although not all areas were cleared every time; generally, an area was cleared as soon as *S. muticum* began to grow back noticeably. Nonmanipulated areas maintained high *S. muticum* cover until early June when *S. muticum* dies back to a perennial holdfast. *Sargassum muticum* densities were estimated by censusing 20 haphazardly placed 0.25 m^2 quadrats. Removal and control areas were censused by counting all juvenile *Macrocystis pyrifera* in contiguous 1 m^2 quadrats. The study site was censused in late June, approximately one month after the natural die-back of *S. muticum*, and in late September, one month before *S. muticum* resumed vegetative growth, to distinguish between the following hypotheses: 1) *Macrocystis pyrifera* recruitment is delayed until *S. muticum* dies back, and 2) *S. muticum* prevents the recruitment of *M. pyrifera*. Differences between areas were examined using the Wilcoxon two-sample test.

Results

In 1979 the *Sargassum muticum* density near the east end of Bird Rock averaged 56.9 plants/m^2 (range 8/m^2 to 136/m^2); plant height was 3–4 m. In June, following the *S. muticum* die-back, juvenile *M. pyrifera* density was significantly higher in removal areas 1 and 2a than their respective controls ($p < 0.001$; Tab. I). Density was not significantly greater in removal 2b than its control. In general, areas near the wall had higher recruitment than their counterparts away from the wall. Recruitment in removal area 1 was significantly higher than removal areas 2a and 2b ($p < 0.01$). The greater juvenile *M. pyrifera* density in control area 1 versus control area 2 was not significant.

Supplementary observations in June of an isolated adult *M. pyrifera* plant 10 m away from the wall, where *S. muticum* was not removed, failed to reveal any juvenile *M. pyrifera* around the adult.

Juvenile *M. pyrifera* density in September 1979, although lower than in June, was still significantly higher in removal areas 1 and 2a than their respective controls ($p < 0.001$ and $p < 0.01$, respectively). Density was marginally significantly greater in removal area 2b than its control ($0.05 < p < 0.10$). Recruitment in removal area 1, near the wall, was significantly higher than removal areas 2a and 2b ($p < 0.01$ and $p < 0.001$, respectively). The difference in juvenile *M. pyrifera* density between control area 1 and control area 2 was marginally significant ($0.05 < p < 0.10$).

Tab. I. Juvenile *Macrocystis pyrifera* density in *Sargassum muticum* removal quadrats and in unmanipulated controls. Censuses were conducted in June 1979, one month after the natural die-back of *S. muticum*, and in September 1979, one month before *S. muticum* resumed growth. N = 30 for area 1 removal, N = 26 for area 1 control, and N = 20 for area 2 removals and control. ** and * indicate removal significantly different from control at $p < 0.001$ and $p < 0.01$, respectively. + indicates removal marginally significantly different from control at $0.05 < p < 0.10$

Area	Distance from wall (m)	*Macrocystis* Density Mean (s.d., range) (Plants/m^2) *Sargassum* Removal		Control
June 1979				
1	2	5.0 (5.91, 0–32)	**	0.4 (0.63, 0–3)
2a	13	1.9 (1.38, 0–12)	**	0.2 (0.37, 0–1)
2b	13	0.4 (0.75, 0– 3)		
September 1979				
1	2	1.9 (2.06, 0– 7)	**	0.1 (0.31, 0–1)
2a	13	0.4 (0.60, 0– 2)	*	0.0 (–)
2b	13	0.1 (0.31, 0– 1)	+	

Discussion

The *Macrocystis pyrifera* juveniles growing in the *S. muticum* removal areas represent the first significant *M. pyrifera* recruitment near the east end of Bird Rock since the establishment of *S. muticum* 3 years earlier. However, *S. muticum* removal did not invariably result in greater numbers of juvenile *M. pyrifera*. One treatment, removal area 2b, was statistically indistinguishable from its nonremoval control. Low recruitment in area 2b may result from the limited distance of *M. pyrifera* dispersal (Anderson and North 1966). Only one adult *M. pyrifera* was within a few meters of removal area 2b. Limited dispersal may also explain the differences between areas 1 and 2, which were 2 m and 13 m away from the wall, respectively. Tidal currents could more easily disperse spores from the numerous adult *M. pyrifera* plants growing on the wall to areas near the wall (area 1) than to area 2, where adult *M. pyrifera* were sparse.

Of the many possible mechanisms by which *S. muticum* may reduce *M. pyrifera* recruitment, shading is perhaps the most likely. The dense *S. muticum* bed (mean of 56.9 plants/m^2) very effectively lowered light levels. Since dense kelp canopies can prevent the development of juvenile *M. pyrifera* (Anderson and North 1969), recruitment under the *S. muticum* canopy seems unlikely. Shading by *S. muticum* may occur at a critical

time in the *M. pyrifera* life cycle. In southern California the peak *M. pyrifera* recruitment occurs in early spring (Anderson and North 1969), after which recruitment is normally very low. The absence of *M. pyrifera* juveniles in the control areas approximately 4 months after the *S. muticum* die-back indicates that *S. muticum* did not simply cause the delay of *M. pyrifera* recruitment, but effectively prevented recruitment.

Sargassum muticum is an extremely successful introduced species, having spread through England and the west coast of the United States in a remarkably short time. Our observations suggest that there is intense competition between *M. pyrifera* and *S. muticum*. Both species utilize the same basic resourse and both form canopies. Although *S. muticum* was present at Santa Catalina Island since 1971 (Setzer and Link 1971), it did not invade the east end of Bird Rock until the massive *M. pyrifera* die-off in 1976, suggesting that the local distribution of *S. muticum* was restricted by competition with *M. pyrifera*. Once *S. muticum* became established at Bird Rock, *M. pyrifera* did not reinvade. Kelp forests are regularly exposed to natural as well as man-made disturbances (North and Pearse 1970, North 1971, 1976, Rosenthal *et al.* 1974). If our observations are generally true, it is possible that by exploiting these opportunities, *S. muticum* may have a substantial impact on *Macrocystis pyrifera* distribution in southern California.

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Outplanting large adult green abalone (*Haliotis fulgens*) as a strategy for population restoration

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Wild abalone populations are in decline around the globe. Given their high market value, abalone have been targeted for restoration in many areas where they were once abundant. Efforts to restore California green abalone (*Haliotis fulgens*) have had limited success for species recovery. This study aimed to use large (>14cm) adult green abalone as a strategy for restoration. Abalone of this size have few predators and are generally emergent, making them more visible during surveys. Sixty-nine large (average size 16.2 cm) farm raised abalone were outplanted in three batches (May, July and August) in Newport Beach, California, on natural reef structure at a depth of 8.4 m, monitored for 15 months, and then recaptured. Using multiple tagging devices and rigorous monitoring resulted in 40% survival at the end of the study, with 61% of the mortalities occurring within the first 30 days of outplanting, and 46% of the August outplants surviving to the end of the study period. Most of the trackable abalone movements, throughout the study, were confined to a 10 m radius of outplanting areas and 79% (22) of the surviving abalone stayed within 8 m of the outplant areas.

Key words: abalone, adult abalone, *Haliotis fulgens*, outplanting, restoration, restocking, size, stock enhancement

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Abalone populations worldwide have been in decline for many decades (Campbell 2000). Over fishing, illegal harvest, disease and habitat degradation are thought to be the primary causes (Cook 2014). California once supported fisheries for five species of abalone (black, green, pink, red, white) and by 1998 all commercial and recreational fisheries were closed south of San Francisco bay. Rogers-Bennett et al. (2004) found that adult abalone densities in southern California were two orders of magnitude below the estimated minimal viable population of 2000 individuals/ha and at that point, abalone recruitment in southern California had declined 20-fold over the previous decade. Despite 20 years of closed fisheries, populations of all five of these abalone species have yet to rebound on coastal reefs in southern California indicating a need for restoration activities. McCormick et al. (1994) suggested that seeding areas with hatchery raised abalone may be the only means of increasing coastal abalone stocks on a time scale meaningful to fishery managers.

The challenges facing abalone restoration include: captive spawning and rearing, protecting aggregated or outplanted animals from poaching, tracking reproduction, quantifying survival, and maximizing survival of captive-reared abalone in the wild (Henderson et al. 1988, Tegner and Butler 1989, Tegner 1992, Rogers-Bennett and Pearse 1998, Tegner 2000). Reseeding or outplanting projects have most often involved larvae and juveniles (0-100 mm) and have had mixed results around the globe with Japan and New Zealand reporting higher than 50% survival for some projects (Saito 1984, Schiel 1993, Kojima 1981). Results for reseeding or outplanting juveniles in southern California report much lower recovery rates ranging from 0-6% (Tegner and Butler 1985, McCormick et al. 1994, Davis 1995, Chick et al.2013). Quantifying recovery rates is a challenge for comparisons of efforts across time, species and different geographic areas.

Green abalone, (*Haliotis fulgens; Philippi*), are native to southern California and range from Point Conception, California, USA, to Magdalena Bay, Baja California, Mexico, and include the offshore islands (Cox 1962). They were once part of a large recreational and commercial fishery, and have previously been a target for species recovery. The green abalone is listed as a federal Species of Concern (NOAA 2004) and based on historic landings, is estimated to be at less than 1% of its baseline density (Rogers-Bennett et al. 2002). The major threat to remaining populations is their low densities and the possibility of reduced reproduction resulting from the Allee effect (Allee 1931). Low densities of broadcast spawners can lead to poor fertilization and recruitment failure because of the distances between males and females (Babcock & Keesing 1999). Remnant populations are comprised primarily of solitary abalone, many of which may not be contributing to reproduction and are thus functionally sterile (Taniguchi et al. 2013). Results from a drift tube study by Tegner and Butler (1985) indicated that in the absence of local broodstock, a fishery closure alone would not be an effective management policy for the recovery of green abalone populations on the mainland in southern California.

There have been several attempts at restoration of green abalone beginning in the 1970s. Most attempts have involved outplanting small hatchery reared animals generally due to costs associated with raising this slow growing mollusk. Seeding or outplanting results are affected by many variables including condition of the abalone at release, size, planting method, season, as well as site specific conditions including habitat type, food availability, predation, and topography (Saito 1984, Schiel 1993, McCormick et al. 1994). Because of the cryptic and mobile nature of small abalone it is difficult to estimate survival in most studies (Breen 1992, Shepherd & Breen 1992). Juveniles are highly cryptic and are found during daylight hours beneath rocks or in the recesses and crevices; they move freely at night and seldom return to the same location as the preceding day (Leighton 2000). Outplanting activities in Baja California with approximately 20 mm (shell length) green and pink abalone have yielded recovery rates ranging up to 4.7% (Sercy-Bernal et al. 2013). In summary, abalone outplanting has many variables to consider and there has been no formula for "success" that works for all species in all locations.

Translocation of abalone involves aggregating wild animals into one location with the aim of increasing reproductive success. A recent trial involving the translocation of adult California green (*H. fulgens*), and pink (*H. corrugata*), abalone showed that green abalone were not a good candidate for this restoration technique because they exhibited site infidelity (Taniguchi et al. 2013). A previous trial of 4,453 translocated green abalone on the Palos Verdes Peninsula, California was inconclusive due to poaching of the aggregated animals in the second year of the project (Tegner 1992).

Natural mortality of juvenile abalone may vary with location, time, and generally declines with age (Tegner and Butler 1985, Prince et al. 1988, Shepherd and Daume 1996). Initial mortality rates for outplanted juvenile abalone species are quite high and the rates decrease as the abalone grow to larger sizes (Schiel 1993). Saito (1984) found that survival of outplanted abalone increased with seed size in the range of 10 to 50 mm. Outplanting large adults in high densities on isolated reefs seems to be more effective (Coates et al. 2013).

Studies conducted in the 40 years before this project noted issues with the following: tagging (tags falling off, not identifiable); tracking (outplanted animals were not surveyed with enough frequency, were too cryptic, or emigrated off study site); predation (the size of the outplanted animals were vulnerable to multiple predators); poaching; and mortalities from transport shock. With historically limited success in green abalone restoration utilizing juveniles, the aim of this study was to use large (>14 cm) adult abalone for outplanting as a possible restoration strategy and to quantify their survival. This project aimed to also address some of the previous noted issues by using multiple tags, surveying with greater frequency, minimal handling in transport, and removing sea star predators. The use of large animals may act as a model for other abalone species including the endangered white (*H. sorenseni*) and black abalone (*H. cracherodii*) as recommended by Davis et al. (1998). The results are compared with previous restoration studies to determine if larger (>14 cm) outplants yield higher survival rates. The premise is that, large abalone have fewer predators and they are more easily detected and tracked.

Materials and Methods

Study site.—The green abalone outplant site was located in Crystal Cove State Park, Orange County, California, with coordinates 33° 34’ 6.528” N, 33° 34’ 6.528” W. The study site was chosen because it was familiar to the author, too far from shore for shore divers to reach, and was not a well-known recreational dive spot minimizing opportunities for poachers. Surveys were conducted to characterize the composition of the reef, describe the topography, and assess the predator population. Predators of large abalone (>14 cm) in Orange County include octopus (*Octopus sp.*), sea stars (*Pisaster sp.*), and the bat ray (*Myliobatis californica*). The surveys were conducted using two different methods. In one method, an observer conducted two 30 x 2 m band transect surveys and the other method included 30 random 1-m^2 quadrats along two 30-meter transects. Each surveyor collected information on reef composition (continuous reef, boulder, sand, or cobble on every meter), changes in rugosity (change in height of the reef at every meter), percent cover (sessile invertebrates, algal species), the presence of wild abalone, and presence/absence of predators.

The 450 m^2 reef was roughly rectangular and was divided into eight quadrants (approximately 9 x 6 m) using plastic clothesline stretched out across the reef and tied off to cinderblocks. Each quadrant was labeled with floating numbers to make the process of mapping the locations of abalone easier for volunteers. The large Pisaster stars were removed before outplanting and continuously removed during the project period. No octopus were removed from the reef but were present during the entire study, and two bat rays were observed near the reef, one before and one during the study.

Tagging.—Seventy adult abalone were purchased ($38 each) from The Cultured Abalone, a commercial farm in Goleta, California. The average size of the abalone was 16.2 cm (max 17.9 cm, min 14.6 cm). These animals were used as broodstock on the farm and thought to be at least 10 years old. They were shipped in three batches to a holding facility in

San Pedro, California in moist foam and oxygen filled bags and held for up to thirteen days to tag, monitor, and reduce stress from transport. Upon arrival, the animals were measured, sexed, affixed with tags using Splash Zone marine epoxy or cyanoacrylate (Super Glue), and photographed. Of the 69 abalone tagged, 87% (60) were identified as female (Table 1). Since abalone are known for choosing crevices, ledges, and overhangs for their home scars multiple tags were used to make the identifiers visible from any angle. The tags identified which outplant batch the animal was from and had both a unique number identifier (Major Tag) and several auxiliary tags (Minor Tag). Each animal was given a "Major" tag with a number, a color coded zip tie, and up to four other "Minor" tags (Figure 1). The Major tags consisted of a 1.5 cm stainless steel disk with etched numbers; a 2.5 cm white plastic square with printed black numbers; or a 4 cm brass disk with printed black numbers. All of the abalone had a colored zip tie secured through the first or second respiratory pore. PIT (passive integrated transponder) tags were epoxied on the shells of 32 of the animals for the purposes locating the animals using a PIT tag reader. Minor tags consisted of one or more of the following: blue aluminum tree tags with etched numbers; colored plastic bottle caps; white plastic beads with black letters; red plastic key tags with white numbers; stainless steel washers; plastic chain links; and metallic painted plastic jewelry (shiny). No two animals had the same combination of tags. The white lettered beads were the only tag affixed with cyanoacrylate. Knowing that the abalone would be cryptic to the observing volunteer divers, the objects used for tagging were meant to help spot the animals and the combinations of tags helped to identify the animals in hard to see places.

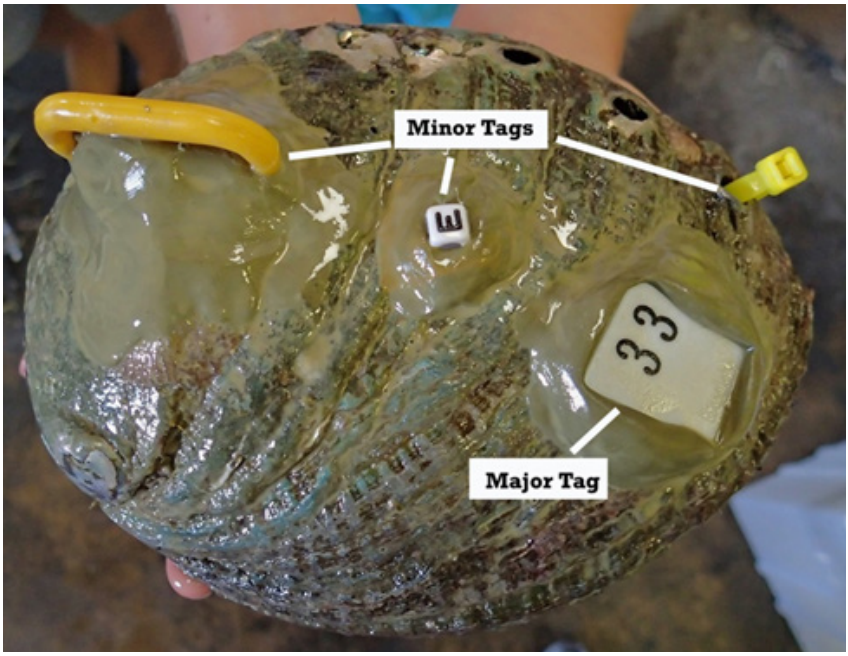

Figure 1.—Example of multiple tagging methods for green abalone outplants illustrating "Major" and "Minor" tags. Recorded as Major tag: #33, Minor tags "E", yellow chain link, yellow zip tie, and PIT tag # (in the epoxy).

Following the tagging activity, the animals were placed in rectangular plastic milk crates and submerged in a recirculating seawater holding systems (18 °C) for up to 13 days. The top of the milk crate was covered with plastic mesh so the animals could not crawl out. There was one mortality while in the holding tanks presumably due to stress related to shipment.

Outplanting.—Sixty-nine green abalone were outplanted in three batches in May 2013, July 2013, and August 2013 (Table 1). The animals were monitored for survival for one year after the last outplanting (until August 2014). On the day of outplanting, the animals were checked for health and for any tag loss, the milk crates were put into large coolers with seawater from the holding tanks and transported to the outplant site by car and then by boat. They were in transport for approximately three hours. While on board the boat, fresh ocean water was exchanged with the water in the cooler by bucket. Divers descended to the reef with the milk crates. When on the bottom, the milk crates were turned on their side and four half-sized cinder blocks were zip- tied to each milk crate to weigh them down. The first and third outplant sites offered more ledges and overhangs while the second outplanting area was on the top of the reef just above the other two. All of the locations chosen to place the crates on were within 5 m of each other on the west end of the reef (Figure 2). In accordance with the outplanting permit, as many abalone as possible were recovered from the test site at the end of the study. All animals were measured at the beginning of the study and emergent animals were measured at the end of the study. Volunteers were asked to not share the outplanting location with anyone. Temperature loggers (Hobo) were deployed from 01 April 2013 to 25 March 2014.

Monitoring.—Monitoring began with the first outplanting in May 2013 and concluded one year after the last outplanting in August 2014, representing a 15-month study period. Rigorous monitoring was required to track the newly released animals as they were very mobile. In order to track this movement, the program utilized volunteers. In total, 28 volunteers were trained as abalone observers. Each dive was led by the Get Inspired project biologist and assisted by up to four other volunteer divers. During each dive, a diver was assigned a quadrant number within which to survey the reef for abalone. Every visible tag

TABLE 1.—Proportion, by sex, of green abalone that were outplanted in three batches and their survival in Crystal Cove State Park, Orange County, California. Average size 16.2 cm.

Outplanted			
	Batch 1 5/26/13	**Batch 2 7/22/13**	**Batch 3 8/11/13**
Females	17	21	22
Males	2	1	6
Total	19	22	28
Survival 8/11/14			
Females	7	7	8
Males	1	0	5
Total	8	7	13

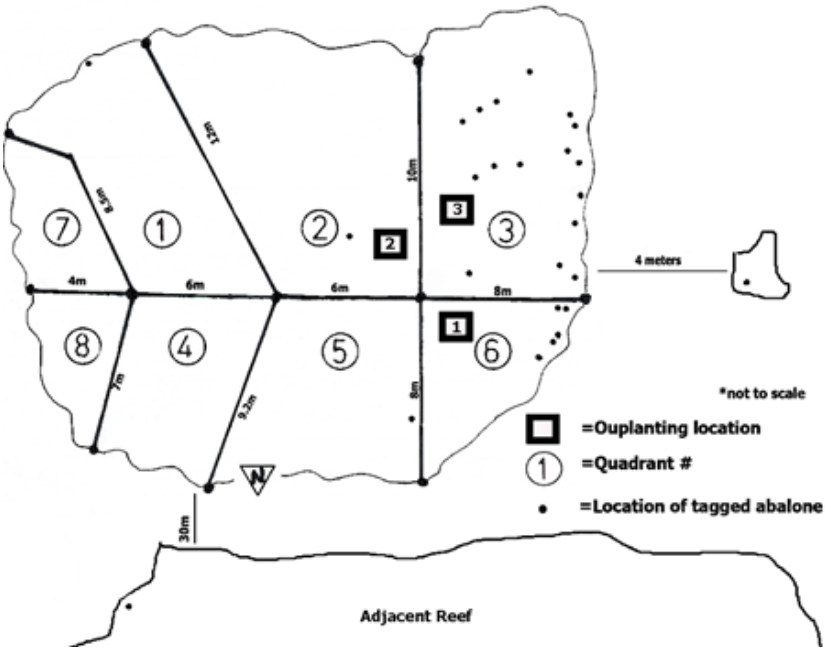

FIGURE 2.—Map of the relative locations of the surviving abalone created 11 August 2014.

on the animal was recorded and the shells and tags were cleaned with a toothbrush to reduce encrusting organisms. By recording every observable tag, even if a "Major" tag could not be seen, the combinations of other visible tags usually lead to the positive identification of a specific animal. If an abalone could not be positively identified, it was not counted that day. Empty shells and shell fragments were also collected for positive identification.

Over the 15-month (60 week) study period, 64 monitoring dives (approximately 45 min each) were made totaling 260 dive hours. Dives were conducted after each out-planting every 48-hours for approximately two weeks to track the immediate movements of the animals. Monitoring tapered off from every 48-hours to every four days, then once per week, then once every 10 days by the end of the study period. Telescoping mirrors and flashlights were used to look under ledges and in deeper crevices for abalone. A map of the location of each abalone was created/updated after each monitoring dive. An animated map was created, at the end of the project, to illustrate relative movements of the animals throughout the study period. Survival was calculated by finding and counting the actual live animals that were positively identified at the end of the study period.

RESULTS

Site Survey.—The study site is composed of continuous rocky reef approximately 450 m^2 in size and surrounded by sand. The reef is composed of bedrock and roughly rectangular with dimensions approximately 18 m wide by 25 m long, with the highest point being approximately 2 m from the sand that surrounds it. Changes in contour are minimal

on the top of the reef with rugosity being less than 1 m. The south and north ends of the reef are composed of ledges, the west end gently slopes down toward the sand, the east end of the reef is a wall that drops 2.5 m vertically to the sand. The reef was at a relatively uniform depth of 8.4 m on the top of the reef and it slopes on each side to a maximum depth of 11.5 m to the sand on the east end. Due to sea urchin removal activities during a giant kelp restoration project conducted on the reef by the author 10 years earlier, sea urchin densities were low with lots of crevice and ledge space available.

Both site survey methods provided similar results with mature giant kelp (*Macrocystis pyrifera)* covering 10% of the reef providing a 30% canopy, reaching the surface over the reef. Approximately 15% of the reef was covered with pink crustose coralline algae, and articulated coralline algae covered 10% of the reef. Subtidal algae (*Cystoseira osmundacea)* covered 5% of the reef surface and other low lying red and brown alga covered 15% of the reef. The remaining 45% of the reef was occupied by sessile invertebrates including tunicates, bryozoans, worms (Serpulorbis sp.), gorgonians, anemones, and sponges. There were no wild abalone observed on this reef before outplanting. The average temperatures on the reef during outplating were as follows: May-18 ^{o}C, July-17.5 ^{o}C, August-15.8 ^{o}C

Tagging.—With continuous cleaning, the multiple tagging strategy worked well for the study period. Although the abalone routinely were wedged up and under rocks and ledges, the multi tag method allowed for identification of the animals from any angle. Only four of the major tags were lost due to poor epoxy application but the animals could still be identified by their minor tags. By the end of the project period, the brass tags (Major Tag) had tarnished making the numbers unreadable although we could still tell they were brass and coupled with the minor tags, each individual could still be identified. None of the zip ties or cyanoacrylate affixed tags were lost during the project period.

Monitoring and movements.—The milk crates allowed for the abalone to attach to something that could easily be moved, placed in a cooler, and transported to the study site with minimal stress to the animal. Upon release, most of the animals immediately moved out of the crates and even within the period of the dive (approximately 45 minutes) they moved up to 2 m away. All of the abalone left the milk crates within 48-hours of outplanting. Some made their immediate homes inside the cinderblocks that weighted down the milk crates so after the first outplanting batch we covered the cinderblocks so the abalone would be forced out onto the reef. All the abalone were released on the west end of the reef and subsequently 96% of the animals stayed on the west side of the reef within a 10 m radius of their release site, either under ledges or oriented at the sand reef interface during the project period. The farthest distance moved by an abalone was 44 m and the shortest distance moved was <1 m, both of which survived until the end of the project (Figure 2).

The PIT tag reader was only used once and was not effective at locating abalone during that one use. An animated map was created from each survey by compiling location information allowing us to see the relative movements of the animals over the course of the study. This animated map is available from the author.

Survival.—Mortality was closely associated with outplanting events with 61% of mortalities (17) occurring within the first 30 days of being outplanted and 9% (6) mortalities occurring in the first week of outplanting. Being out and on top of the reef (emergent) was not the key factor in mortality because several animals survived through the entire project while in conspicuous places on top of the reef. No direct predation was observed, although we did remove a giant sea star (*Pisaster giganteus*) from the shell of a live abalone. Thirteen mortalities were observed with crushed shells (Figure 3) and the meat gone, with the shell

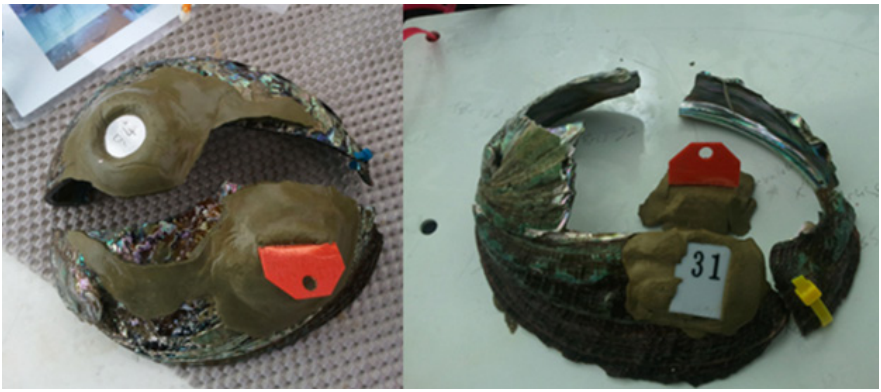

FIGURE 3.—Example of crushed shells which resulted in 13 mortalities, predator unknown.

fragments found in the same location that the live animal had been previously observed. The shell crushing predator was never observed.

During this 15-month study period, 28 animals (40%) survived (Table 1). We searched adjacent reefs and boulders off the study site. Two abalone were found on a boulder 4 meters away from the outplant reef. They migrated there independently over a two month period. Another abalone ventured across 10 m of sand, across 20 m of reef, then across another 4 m of sand to another adjacent reef. There were 13 animals or 19% of the original 69 that were missing and not accounted for at the end of the project. Some of these animals presumably could have survived. Of the 13 missing animals, seven went missing within 30 days of outplanting and were never seen again. Three of those abalone were missing from the first week of outplanting.

After observing the habitat preferences of the first two batches of outplanted abalone, we chose the third outplanting site to match that of the first. It was 5 m away from the first on the edge of the west end of the reef with many overhangs and ledges. The last batch of abalone (28), outplanted in August, had 46% survival (Table 1). At the end of the 15-month period, eight abalone were retrieved in accordance with CDFW permits. The other 20 were not retrievable due to their positioning on the reef. The average growth of those eight surviving and retrieved abalone was 2.2 mm over the study period. Two of the 13 missing abalone were found dead two months after the end of the study period.

DISCUSSION

Based on findings from Tanaguchi et al. (2013), that green abalone expressed site infidelity when translocated; this survey site was specifically chosen because it was surrounded by sand. It was a disproven assumption that sand would act as a barrier and deter abalone movements. This finding presents a problem for future studies and may shed some light on previous studies where recapture rates were low. Green abalone will leave study sites even if it means crossing expanses of sand. It is possible more abalone emigrated from the survey site and these represent a proportion of the missing animals. Abalone movements and migrations are still poorly understood and continues to be a problem for abalone

outplanting/reseeding efforts. Current telemetry will add new knowledge to this question.

Juvenile abalone of all species may move tens of meters, but this tendency decreases with age (Cox 1962, Tutschulte 1976). Adult abalone generally have very limited movements (Shepherd 1973, Tutschulte 1976). Abalone have been known to move considerable distances which has made previous restocking projects challenging and often ineffective (Shepherd 1986, Ault & DeMartini 1987, Tegner & Butler 1989). The majority of the abalone that survived until the end of this project appeared to move very little during the project period, though this also made them easier for divers to find repeatedly. After each survey, a map of the relative locations of the abalone was created. From this, we noted that 22 (79%) of the surviving abalone were within an 8 m radius of the release sights at the end of the project (Figure 2). Many did not appear to move at all from these scars during the entire study. This may be an advantage of using large adult green abalone. In a telemetry study, Coates et al. (2013) mentions a "flight" response when pink abalone were translocated, this was thought to occur within the first 20 days after moving the animals. The reported 61% of the abalone mortalities from this study, occurred in the first 30 days and may have been due to this "flight" response in the initial phase after outplanting.

The fact that the abalone used for this study were farm raised has not been shown to be a factor in their ability to hide (Tegner and Butler 1985, Schiel and Weldon 1987). It appears that abalone have home scars and possibly home ranges for localized movements (Ault & DeMartini 1987, Tutschulte and Connel 1988). Some of the abalone in this study found their home scars right away while others seemed to "roam" throughout the study period. The challenge is to determine how long it takes for introduced/outplanted large emergent adult abalone to get acclimated to their outplanted reef so they "settle" in fast and find a home scar. Ideally, it would be most advantageous to be able to place abalone directly onto their preferred home scar location in hopes that they would stay there when outplanted.

There were at least 13 known abalone mortalities which involved crushed shells and there were many more shell fragments found that could not be identified. Given that these abalone were large with a shell thickness of at least 3 mm, the list of possible predators was small. Very large bat rays and humans are capable of such crushing forces. Giant seabass are capable of both "sucking" them off the reef and inflicting the force necessary to crush the shells (L. Allen, California State University Northridge, personal communication). Often the crushed shell would be found with all the pieces in the same spot that the live abalone was seen just 48 hours before. In October 2013, suspecting poaching as the possible cause of the crushing mortalities, floating signs were posted around the reef warning humans that they were under surveillance and that they were violating the law by taking or killing the animals. It should be noted that within 30 days of the signs being put up, the crushing mortalities stopped. This could be coincidence. It should be noted, that in January 2014 a mortality event (sea star wasting disease), which affected the west coast of North America, resulted in a die-off of all sea star species observed on the reef (Hewson et al. 2014). Sea stars, therefore, were not a predator of concern during much of this study.

Difficulties involved in quantifying the results of outplanting and reseeding efforts make it difficult to make comparisons between studies (McCormick et al. 1994). A summary of abalone outplanting projects around the world, their duration, and percent survival was compiled by Chick et al. (2013). In comparison with those studies, this study has notable survival rates for the project duration (>1 year) and species outplanted, and also used the largest size abalone. Of the studies conducted with larger red and green abalone (40-100

mm) in southern California, survival rates were only as high as 2.8% and the researchers claimed they found no evidence of size differential in survival (Tegner and Butler 1985, Tegner and Butler 1989, Davis 1995). Although survival may be quantified using several different methods, it is important to note that the survival rates reported for this study are actual, not estimates. Each animal counted as a survivor was physically observed.

The frequency with which the animals in this study were surveyed was an advantage for monitoring their survival and it may have been the key to the high recapture rates. We were able to observe their movements regularly (at most every 10 days). With the success of tracking and survival of the animals in this study, it is evident that the strategy of using larger animals for restocking green abalone is worthy of further study. The survival rate for this project is notable and far exceeds survival rates in other studies with green abalone. The animals used in this study were estimated to be at least 10 years old (ranging in size from 14.6 cm to 17.9 cm) by the farmer from whom they were purchased. The costs associated with raising them to this size may be great but there have been decades of attempts to restock. One expensive project may be worth 30 or more failed larval or juvenile outplanting attempts. Perhaps, outplants could be clustered to create reproductive "colonies". The animals used in this study seem to be the largest used in a California abalone restocking/outplanting study. We are currently spawning wild abalone to repeat this test in a future study in several different locations and may include animals 10 cm to 14 cm.

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Research Article

Distribution patterns of the non-native seaweeds *Sargassum horneri* (Turner) C. Agardh and *Undaria pinnatifida* (Harvey) Suringar on the San Diego and Pacific coast of North America

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Abstract

Here we report the occurrence of the two non-native brown macroalgal species *Sargassum horneri* (Turner) C. Agardh and *Undaria pinnatifida* (Harvey) Suringar in San Diego County and describe expansions in their ranges and new invasions on the California and Baja California coasts. Both species have exhibited characteristics of successful invaders: establishing in new areas, spreading locally, and persisting through multiple generations in areas that have been invaded. These species now occur primarily in harbors, but have also invaded open coast sites, suggesting that they can invade areas with relatively high wave action and with well-established native benthic communities. The rapid and uncontrolled spread of these species to date has serious implications for their expansion along the west coast of North America. The ecological and economic consequences of these invasions require further research.

Key words: invasive algae, macroalgae, California, Channel Islands, Cabrillo National Monument

Introduction

Marine algal invasions have become a pervasive problem. Diverse impacts include reductions in biodiversity and the abundance and performance of native species as well as changes in community structure and function (Walker and Kendrick 1998; Thresher 2000; Inderjit et al. 2006; Schaffelke et al. 2006; Valentine et al. 2007). Marine algal invasions can also threaten economically important species and industries such as aquaculture and tourism (Schaffelke et al. 2006). However, relatively few studies have comprehensively analyzed these invasions or addressed their effects (Nyberg and Wallentinus 2005; Inderjit et al. 2006; Schaffelke et al. 2006; Johnson and Chapman 2007; Schaffelke and Hewitt 2007; Valentine et al. 2007; Smith 2011). As a result, many gaps exist in our current knowledge of how specific non-native seaweeds affect indigenous ecosystems and the economies that depend on them.

Despite the fact that hundreds of species of non-native seaweeds have been documented around the world, research to date has largely focused on a small fraction of these species and a limited number of invasion locations, or has simply documented occurrence without analyzing patterns of distribution or change over time (Inderjit et al. 2006; Johnson and Chapman 2007; Williams and Smith 2007). Consequently, very little is known about the natural history of non-native algal species in their invaded environments and their interactions with recipient environments, both important elements known to influence invasion success (Valentine et al. 2007). Studies that document species-and-region-specific patterns of establishment, spread, and persistence are a crucial first step in closing major gaps in our knowledge of the invasion process. Further, because invasions often proceed rapidly it is important to gain a better understanding of how new invaders spread in the early stages of establishment.

Southern California and the surrounding coastline have received multiple high-profile invasive algal species, but little information is available about the invasion dynamics of these taxa. A recent review by Miller et al. (2011) reports 27 non-native seaweed

species in California and 11 in Baja California, 9 of which are common to both areas. Most of these have been discovered in the last 30 years, and while the rate of introductions may not necessarily be increasing, climate change may increase the establishment of non-native species in Southern California and Baja California (Carlton 2000; Harley et al. 2006; Miller et al. 2011). This area has been invaded by some of the most high profile algal invaders in the world. *Caulerpa taxifolia* (M.Vahl) C.Agardh was first detected in two locations in Southern California in 2000 but was contained and successfully eradicated by 2006 (Jousson et al. 2000; Anderson 2005; Smith 2011). Other successful invaders include *Undaria pinnatifida* (Harvey) Suringar, first noted in 2000 (Silva et al. 2002), the globally invasive alga *Sargassum muticum* (Yendo) Fensholt, which was first noted in the 1970's and which has since become naturalized in this area (Norton 1981; Miller et al. 2007), and *Sargassum horneri* (Turner) C.Agardh, first noted in 2003 (Miller et al. 2007). Despite the long invasion history of this area, the dynamics and ecology of the non-native seaweeds in this region remain relatively unexplored.

Undaria pinnatifida is an aggressive invader worldwide, having colonized Argentina, New Zealand, Australia, Atlantic Europe, and the Mediterranean Sea (Silva et al. 2002; Nyberg and Wallentinus 2005). Its alarming rate of spread and ability to occupy and alter a variety of native systems have made this species one of only two algae on the International Union for the Conservation of Nature (IUCN) list of 100 most invasive species on the planet (Lowe et al. 2000). *Undaria pinnatifida* exhibits opportunistic life history traits that contribute to its successful establishment in new areas: a short, annual life span (Schaffelke et al. 2005; Miller and Engle 2009), high growth rate and fecundity, (Schaffelke et al. 2005; Valentine et al. 2007), and both a small and large dispersal shadow (Forrest et al. 2000). Serious negative ecosystem effects of this species - including reductions in native seaweed diversity- have been documented in shallow coastal communities elsewhere (Casas et al. 2004; Farrell and Fletcher 2006; Schaffelke and Hewitt 2007; Williams and Smith 2007). Because of the lack of knowledge of *U. pinnatifida* on the Pacific coast of North America and the potential for significant impacts of its further spread, we document the current distribution of this species in this region in the early stages of invasion.

In the early 20th century, *Sargassum muticum* was introduced to North America from northeast Asia and quickly spread throughout the west coast, reaching southern California in the early 1970's (Miller et al. 2007). This species is a highly successful invader worldwide and is considered to be naturalized in intertidal and subtidal communities throughout southern California (Harries et al. 2007; Miller et al. 2007). Some of the ecological effects of this species, such as reduction of native algal abundance and inhibition of native kelp recruitment have been assessed in Washington, California, and Baja California (Norton 1977; Ambrose and Nelson 1982; Espinoza 1990; Aguilar-Rosas and Machado Galindo 1990; Britton-Simmons 2004). Yet despite its widespread presence in southern California, there have been few studies examining the effects of this naturalized species in this area (Deysher and Norton 1982; Miller et al. 2011) or its current distribution.

Sargassum horneri was first discovered in Long Beach Harbor in 2003 (Miller et al. 2007), the first instance of this species outside of its native range (Miller et al. 2007). *Sargassum horneri* is one of the most abundant members of the algal community in temperate areas of Japan and Korea (Choi et al. 2003; Pang et al. 2009). This alga is an ecosystem engineer in these areas, growing up to 5 m tall in dense forests that provide habitat and spawning grounds for a diverse assemblage of organisms (Choi et al. 2003; Choi et al. 2008). *Sargassum horneri* is known for its high reproductive capacity, ability to rapidly colonize new areas, and fast growth rate (3–5 m in 10 months) (Choi et al. 2003). Due to its life history characteristics and its rapid spread in the short time frame since its original introduction, *S. horneri* is recognized as having the potential to be highly invasive in Southern California, Baja California, and other areas along the west coast of North America (Nyberg and Wallentinus 2005; Miller et al. 2011). Despite the rapid invasion of *S. horneri*, little is known about its current distribution and ecological impacts in southern California and Baja California.

The goal of this study was to provide detailed information on the distribution of *S. horneri* and *U. pinnatifida* on the San Diego County coast, and to analyze patterns of establishment, spread, and persistence of these seaweeds along the California and Baja California coasts. Specifically, our first goal was to describe the distribution of these non-native algae in San Diego County. Second, we documented how the presence of these species has changed with regard to: the number of locations they have become established; spread of populations within invaded sites; and persistence of populations. Third, we compared

invasion locations to ascertain whether certain habitats appear to be more invasion prone than others. Finally we assess the occurrence of these species in San Diego County within the context of the invasion of the broader California and Baja California coastlines.

Methods

We used three approaches to describe the distribution, abundance, and invasion patterns of non-native macroalgae in San Diego and the broader region: broad-scale qualitative presence/absence surveys; smaller-scale quantitative benthic community surveys; and a synthesis of published and unpublished literature.

Site selection

Thirty-two sites (10s of m in extent) in eight locations (1–10 km apart, Figure 1) in San Diego County were assessed (n=1–7 sites per location, depending on availability of suitable habitat within each location). Surveys were initially conducted in January 2012 at Mariner's Cove, Mission Bay, where the first population of *S. horneri* was discovered. Four additional sites with rip-rap substrate similar to Mariner's Cove were surveyed between February and July 2013 (Supplementary material Table S1). In July 2013, permanent sites for qualitative and quantitative surveys were established. These sites were located between Oceanside Harbor and San Diego Bay. All sites were then surveyed during summer 2013 (23 July 2013 – 7 August 2013), winter 2013 (8 December 2013 – 20 December 2013), and summer 2014 (2 July 2014 – 1 August 2014).

Survey locations were grouped into three site types based on site characteristics: harbors (n=3), open coast jetties (n=2), and natural open coast locations (n=3). Harbor locations included San Diego's three main harbors: Oceanside Harbor, Mission Bay, and San Diego Bay. The two open coast jetties, Ponto Jetty and Del Mar Rivermouth were located between Oceanside Harbor and Mission Bay. Open coast locations were La Jolla Cove in the Matlahuayl State Marine Reserve, Bird Rock in the South La Jolla State Marine Reserve, and the Cabrillo National Monument State Marine Reserve. Because it is an area of special ecological and management interest, Cabrillo National Monument was surveyed five times: fall 2013 (20 October 2013) and spring 2014 (2 April 2014) and the three survey rounds listed above.

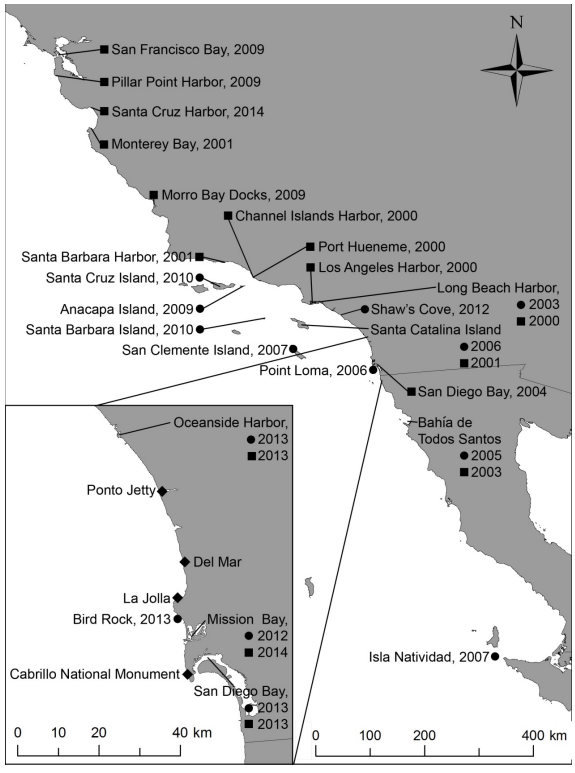

Figure 1. Map of locations where the non-native algae: *S. horneri* (circles) and *U. pinnatifida* (squares) have been documented; diamonds indicate locations where no non-native seaweeds were documented. The larger map presents results from our literature review and from herbarium collections while the inset map presents results from our survey of San Diego County. The year where each species was first documented is also shown for each location.

Within each of the eight locations, survey sites were established on hard bottom substrate suitable for the growth of macroalgae. Harbor and jetty sites were established on rip-rap rock that typically terminated in sand at maximum depths of 5 m. For open coast locations, survey sites were chosen from a habitat map generated in ArcGIS with LIDAR data. Fifteen stratified random coordinates in each open coast location were generated then ground-truthed for suitability (hard substrate, depths from 0–5m). From these, three points in each location were randomly selected as survey sites.

Qualitative surveys

Rapid qualitative surveys were conducted at 32 sites across all eight locations (Table S1) to note the establishment of populations at new sites and to describe how established populations were

Table 1. Summary information from presence-absence surveys with estimated peak abundance (# stipes / site) of non-native brown macroalgae at survey sites for all sampling rounds (Winter / Summer 2012–2014). Sites that were not sampled are shown with "ns", white indicates absence of non-native macroalgae, light grey indicates *S. horneri* was found, dark grey indicates *U. pinnatifida* was found, and black indicates both species were found concurrently. Categorical abundances are shown as follows: absent (-); 1–10 stipes (+); 11–100 stipes (++); 101–1000 stipes (+++); >1000 stipes (++++).

Location	Site	Winter 2012	Spring 2013	Summer 2013	Winter 2013	Summer 2014	*S. horneri*	*U. pinnatifida*
Oceanside Harbor	Oceanside Harbor North	ns	ns				-	+
	Oceanside Harbor, Marker 6	ns					-	++
	Oceanside Harbor, Marker 4	ns					+	++
	Oceanside Harbor Docks	ns					-	++
Ponto Jetty	Ponto Jetty	ns					-	-
Del Mar	Del Mar Rivermouth	ns					-	-
	9th Street	ns	ns				-	-
	Flat Rock, Torrey Pines	ns	ns				-	-
La Jolla	Dike Rock, Scripps	ns	ns				-	-
	La Jolla Cove East	ns					-	-
	La Jolla Cove West	ns					-	-
	La Jolla Cove Central	ns					-	-
	Boomers Cove	ns	ns				-	-
	Casa Cove	ns	ns				-	-
	Marine Street	ns	ns				-	-
Bird Rock	Bird Rock North	ns	ns				-	-
	Bird Rock Central	ns	ns				++++	-
	Bird Rock South	ns	ns				++++	-
Mission Bay	Mission Point						++++	-
	Hospitality Point	ns	ns				++++	-
	Vacation Island	ns	ns				++++	-
	Quivira Basin	ns	ns				++++	++
San Diego Bay	Harbor Island East	ns	ns			ns	-	+
	Harbor Island Central	ns	ns				-	+
	Harbor Island West	ns					-	-
	Shelter Island North	ns					++++	-
	Shelter Island South	ns	ns				++++	-
	Marina Park, Seaport Village	ns	ns				-	-
	Coronado Ferry Terminal	ns	ns				-	++
Cabrillo Natl. Monument	North Cabrillo	ns	ns				-	-
	Central Cabrillo	ns	ns				-	-
	South Cabrillo	ns	ns				-	-
	# locations where non-native seaweeds found:	1	4	3	10	13	9	8

spreading in spatial extent through time for large swaths of coastline. At each site, we searched for *S. horneri* and *U. pinnatifida* at depths of 0–5 m along as much of the coastline as possible, using SCUBA in some sites to access deeper reefs. Hard bottom substrates in harbors, including harbor breakwalls and jetties, rip-rap, and along docks and dock pilings, were searched. At open coast sites (including jetties), hard bottom substrata was searched, with a special focus on areas of low wave exposure.

Presence-absence and relative abundance (<10, 11–100, 101–1000, >1000 stipes per site) of *S. horneri* and *U. pinnatifida* were recorded. When either of these species was encountered, habitat characteristics (depth, substrate type, exposure to current and waves) and size and reproductive status of the algae also were recorded.

Quantitative surveys

Quantitative surveys were conducted at twenty sites across all eight locations (Table S1) to describe changes in non-native algal density through time and to determine if patterns of density and distribution existed with respect to benthic composition of survey locations. At each site, three 5 m transects were set 5 to 10 m apart, perpendicular to shore from 0–5 m depth. In five 1-m^2 quadrats placed on alternating sides of each transect line, brown macroalgal taxa (> 10 cm tall) were identified to species and the number of stipes was counted. In each quadrat, visual estimates of percentage of substrate covered were also made to the functional group level, which included all abiotic (bare rock, sand, shell), and biotic (articulated coralline algae, crustose coralline algae, fleshy crust, turf algae, brown, green and red fleshy macroalgae, seagrass, and sessile benthic invertebrates) components of the benthic community. Quadrats that contained substrate unsuitable for the growth of macroalgae (100% sand) were removed from the data set so that densities were reported per area of available hard bottom habitat.

Statistical analysis

Our hierarchical sampling scheme was designed to allow comparisons of non-native algal populations at the site, location, and site type (harbor versus open coast) level. To compare densities of native, non-native, and non-native naturalized brown algae (*S. muticum*) among sites, mean site-level stipe densities (# stipes / m^2) were calculated for each site and sampling round. To compare non-native algal abundance between site types, a three-factor analysis of variance (ANOVA) was used with site type and sampling round as fixed effects and location as a random effect nested within site type. Jetties were not included in the comparison among site types due to the low number of jetty sites (n=2). To explore how algae may use space in different habitats, we plotted native versus non-native site-level mean stipe densities for each sampling round.

Benthic cover data from quantitative surveys were examined using principal components analysis (PCA). Scores along the first PC axis were used to examine if densities of native, non-native naturalized or non-native taxa were related to benthic composition across our data set. Statistical analyses were performed using SigmaPlot 13 (Systat Software Inc., San Jose, California, USA) and JMP 12 (SAS Institute Inc., Cary, North Carolina, USA).

Literature review and synthesis

To provide an updated regional distribution for both species, all published and unpublished accounts of *S. horneri* and *U. pinnatifida* on the Pacific coast of North America were gathered from ISI Web of Science and Google Scholar, the University of California Herbarium database (https://webapps.cspace.berkeley.edu/ucjeps/publicsearch/publicsearch/), and personal correspondence with researchers. Web of Science and Google Scholar were searched using the key words: Baja California, California, distribution, invasive algae, *Sargassum horneri*, and *Undaria pinnatifida*. Discovery dates, identifier, location, latitude/longitude, and any depth, habitat and density information were recorded.

Results

San Diego County distribution

Sargassum horneri was found at 28% of the thirty-two sites and *U. pinnatifida* was found at 25% of the sites (Table 1). In all cases, non-native algae were found at sites where they had not previously been documented. Overall, non-native algae occurred in 43.75% of San Diego sites surveyed, and occurred disproportionately in harbor sites, with 86.7% of harbor sites having non-natives present at some point during sampling. These two invaders were found at 13.3% of open coast sites and never found to occur in jetty sites. Both species occurred together at two of San Diego's three harbors, Oceanside Harbor, and Mission Bay. In general, native brown macroalgal species dominated at our survey sites, contributing 56.7 ± 1.94% (mean ± SE) of all macroalgal stipes. The non-native naturalized alga (*S. muticum*) made up 29.1 ± 1.74%, and non-native brown macroalgae made up 14.2 ± 1.31% of stipes. For the individual non-native macroalgal species, *S. horneri* contributed 12.4 ± 1.26%, and *U. pinnatifida* made up 1.8 ± 0.47% of macroalgal stipes across all study sites.

Establishment of new populations in San Diego through time

The number of sites where *S. horneri* was found increased during our study from one to nine sites (Table 1). On 15 January 2012, *S. horneri* was discovered at a single site at Mission Point in Mission Bay. Spring 2013 surveys documented no new populations of *S. horneri,* though a second survey of Mission Point revealed a persistent, dense and localized population. All *S. horneri*

populations discovered during our survey effort persisted throughout the duration of the study. During our first comprehensive survey of thirty-two sites (summer 2013), *S. horneri* was found at two new sites, in Bird Rock South, an open coast site in Bird Rock, and on the south end of Shelter Island in San Diego Bay (Table 1). At Bird Rock, juvenile *S. horneri* thalli were found in the 3–5 m depth range on cobble coated in crustose coralline algae. This was the only open coast location to have *S. horneri* throughout our survey. At Shelter Island, *S. horneri* was found growing at depths of 1–5 m along the rip-rap breakwall on the south end of the island near the marina in an area of high boat traffic.

During the winter 2013 survey, *S. horneri* was found at five new sites (Table 1). The species appeared intermingled with native algae in a small patch near the mouth of Oceanside Harbor (Oceanside Harbor North). The previously localized population at Bird Rock South spread to the Bird Rock Central site. *Sargassum horneri* was also found at three new sites in Mission Bay: at Hospitality Point, in the boat marina at Quivira Basin, and on a rip-rap breakwall near the boat ramp at Vacation Island.

During our final comprehensive sampling round, summer 2014, *S. horneri* was found at one new site, Shelter Island North. While in past surveys the species was localized at Shelter Island South, during this final survey it was observed growing along the entire length of the harbor breakwall.

Overall, we found *U. pinnatifida* at eight sites in San Diego County, and the number of sites in which it was present increased through time (Table 1). *Undaria pinnatifida* was first found at three sites in Oceanside Harbor in spring 2013: near the mouth of the harbor on a rip-rap breakwall (Oceanside Harbor, Marker 6), deeper in the harbor on rocks surrounded by soft muddy substrate, (Oceanside Harbor, Marker 4), and attached to the underside of 10–15 docks within the marina (Oceanside Harbor Docks). *Undaria pinnatifida* was not found at any site during the summer 2013 survey, including the Oceanside Harbor sites. During the winter 2013 survey, *U. pinnatifida* was found at the eastern end of Harbor Island and at the Coronado Ferry Terminal. At Harbor Island we found a group of large isolated thalli (approx. 1–2 m length) on a rip-rap breakwall, a cement breakwall, and on pilings. In Coronado, *U. pinnatifida* was observed on the underside of the ferry landing docks. In summer 2014, *U. pinnatifida* reappeared in Oceanside Harbor at the same three sites it was previously found and was found at Quivira Basin in Mission Bay and the central part of Harbor Island.

Spatial spread at sites through time

Within established sites, *S. horneri* consistently increased its spatial extent through time. At Mission Point in Mission Bay, this species was initially confined to a small section of protected rip-rap within Mariner's Cove growing on bare rock in an area sparsely populated by *S. muticum* and the native species *Dictyopteris undulata* Holmes and *Dictyota flabellata* (F.S. Collins) Setchell and N.L. Gardner. Further west on the harbor breakwall, where tidal current flows are much higher, and where native kelps (e.g. *Macrocystis pyrifera* (Linnaeus) C.Agardh, *Egregia menziesii* (Turner) Areschoug, and *Eisenia arborea* (Areschoug) occur in higher density than on the inner breakwall, no *S. horneri* was found. This population remained localized between January 2012 and spring 2013, but in summer 2013 the length of the breakwall occupied by *S. horneri* had expanded by roughly 0.33 km, with new recruits occurring in patches moving outward toward the mouth of Mission Bay. During winter 2013, these recruits developed into mature and fertile adult thalli, which then produced another cohort of recruits approximately 0.6 km further west on the breakwall in summer 2014.

A clear pattern of population expansion with each recruitment cycle was also observed at other sites. At Hospitality Point the population on the inner breakwall spread westward toward the mouth of the harbor with each recruitment cycle. At Shelter Island, the species spread from the south end of the island north, eventually reaching the north end by winter 2013. At Bird Rock, the population was discovered in a small patch at the center of the cove in summer of 2013, but eventually occupied the majority of the cove by winter 2013, again spreading with each recruitment event.

In contrast, *Undaria pinnatifida* occurred in low density populations that remained localized through time. At all sites where it was observed, densities were highest in spring to late summer, following the annual pattern of recruitment and development seen in native populations (Saito 1975) and previously observed in Santa Barbara Harbor (Thornber et al. 2004) and at Santa Catalina Island (Miller and Engle 2009). While other populations die off entirely in the late summer or early fall (Miller and Engle 2009), mature reproductive adults were observed in low densities year round in San Diego locations.

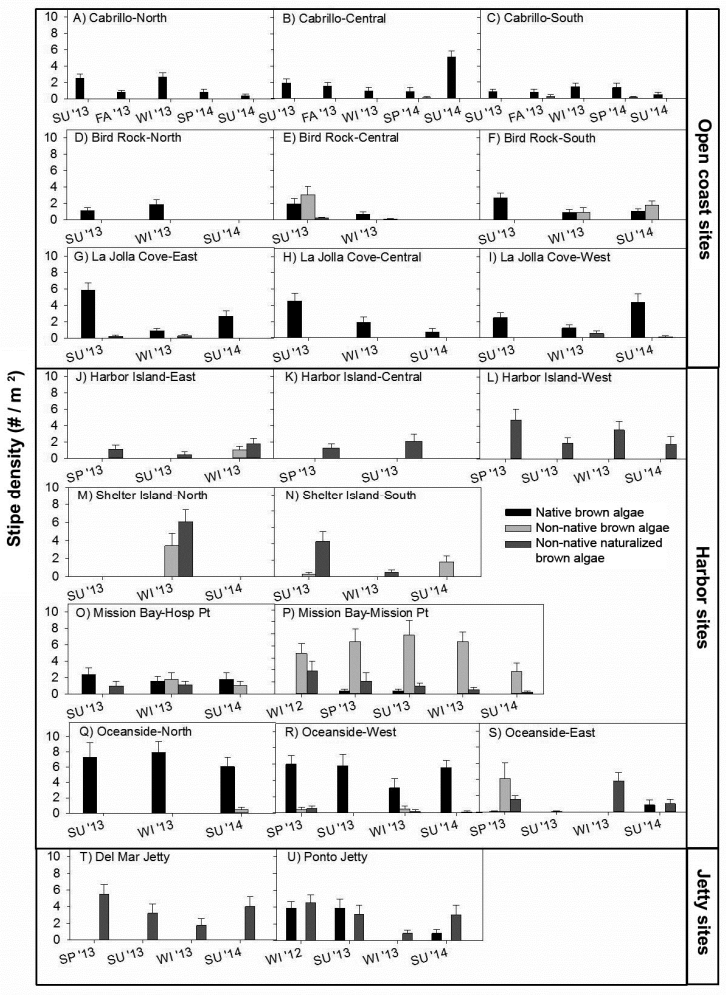

Figure 2. Mean density (± SE) of native (black), non-native (*S. horneri* and *U. pinnatifida,* light grey), and non-native naturalized (*S. muticum,* dark grey) brown macroalgae at quantitative survey sites in San Diego County during each survey round (Winter 2012, Spring 2013, Summer 2013, Fall 2013, Winter 2013, Spring 2014, Summer 2014 (abbreviated in figure)) and grouped by site type.

Changes in density through time

Despite an increase in both the number of sites where *S. horneri* and *U. pinnatifida* were present, and in the spatial extent of their populations, the density at each site did not increase for either species (Figure 2). At Bird Rock central and Bird Rock south (Figure 2E and F), the open coast sites where *S. horneri* was found, populations were patchy and densities were consistently low. Harbor sites had persistent but consistently low density populations of *S. horneri* (Shelter Island North and South, Figure 2M and N, and Hospitality Point, Figure 2O) and *U. pinnatifida* (Harbor Island East, Figure 2J). Finally, at Mission Point (Figure 2P) *S. horneri* densities were consistently higher than any other site, with the mean density ranging between 4.31 ± 1.54 stipes/m^2 (summer 2014) and 10.08 ± 1.53 stipes/m^2 (winter 2013).

Habitat type and benthic composition

Mean stipe densities of non-native species were significantly higher at harbors than at open coast sites (Table 2). Overall mean stipe densities (stipes / m^2 ± SE) for the Summer 2013, Winter 2013, and Summer 2014 survey rounds were 1.03 ± 0.97, 1.91 ± 1.10 and 1.11 ± 0.56 for harbors, and 0.0 ± 0.0, 0.47 ± 0.35, and 0.20 ± 0.20 for open coasts. There was significant variation in density of non-native species among sites within locations and among locations within site type. There were no differences in non-native species densities among sampling rounds, nor was there an interaction between site type and sampling round. Harbor sites exhibited either high native stipe densities or high non-native stipe densities, and no site had high densities of both concurrently (Figure 3). Open coast sites had low densities of non-native species and a range of densities of

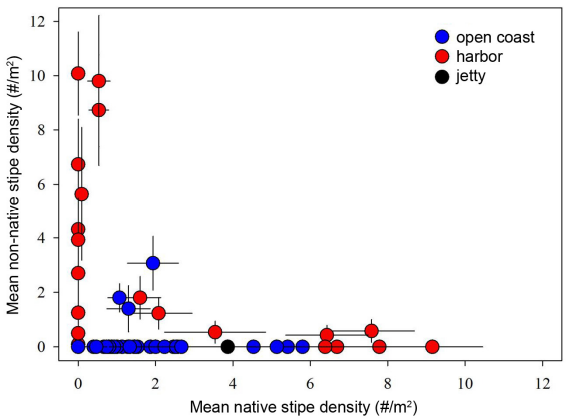

Figure 3. Mean (± SE) native vs. non-native algal stipe density (stipes/m^2) for open coast sites (blue circles), harbor sites (red circles), and jetty sites (black circles).

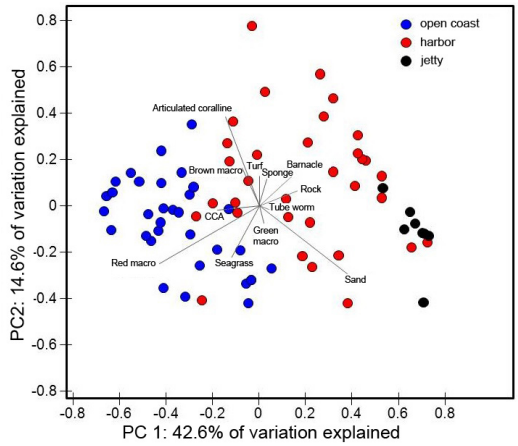

Figure 4. Principal component analysis (PCA) of major benthic groups from all sites with benthic cover survey data (n = 32 (open coast, blue), n = 34 (harbor, red), n= 8 (jetty, black)).

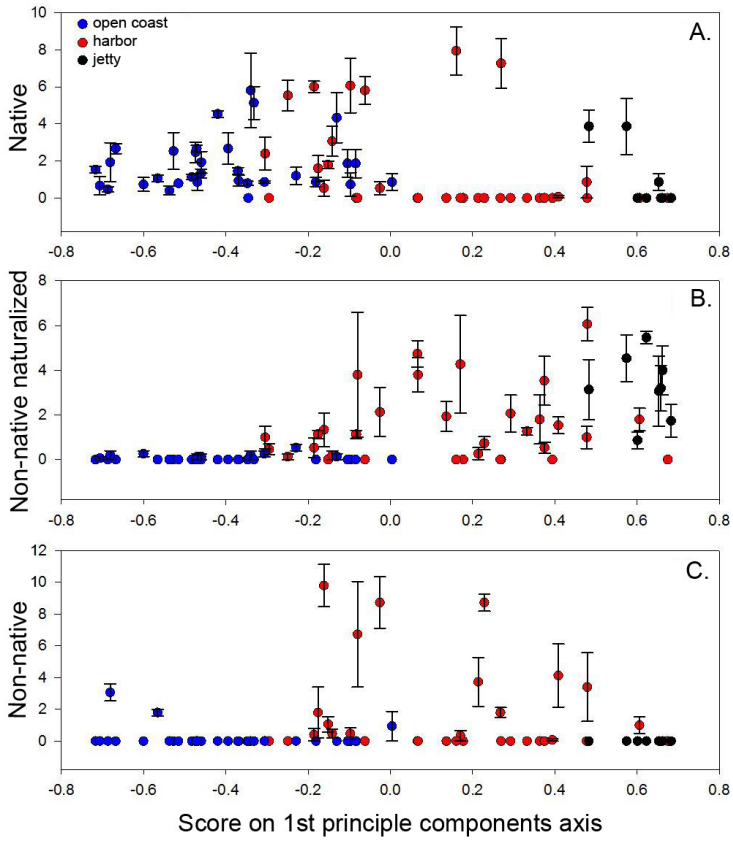

Figure 5. PC1 vs. native (A), non-native naturalized (B), and non-native (C) mean stipe densities at survey sites (n = 32 (open coast, blue), n = 34 (harbor, red), n= 8 (jetty, black).

native algae. Jetty sites had intermediate densities of native species and lacked non-natives entirely. When examining benthic community composition across all sites surveyed in this study (Figure 4), the first two principal component axes (PC1 and PC2) described over 50% of the variation in the data (with PC1 explaining 42.6% of variation). Sites within each site type clustered together along PC1 (left to right from open coast to jetty, Figure 4) suggesting that each site type was

Table 2. Results from three-way ANOVA testing for differences in mean non-native stipe densities across location nested within site type, site type (open coast versus harbor) and survey round.

Source	*df*	MS	SS	F	*p*
Site [Location, Site Type]	13	6.2331	81.0301	4.8074	0.0002
Site Type	1	26.5361	26.5361	20.4663	< 0.0001
Location [Site Type]	4	20.7358	82.9432	15.9947	< 0.0001
Site Type x Survey Round	2	0.4742	0.94833	0.3657	0.6968
Survey Round	2	1.8880	3.77605	1.4562	0.2491
Error	30	1.29658	38.8973		
Total	52				

Table 3. Summary of *S. horneri* and *U. pinnatifida* documentations on the Pacific Coast of North America from published sources and University of California Herbarium (Berkeley, California) database specimens.

Species	Year	Location	Source	Latitude	Longitude
S. horneri	2003	Long Beach Harbor	Miller 2007	33º 42.0' N	118º 14.0' W
	2005	Todos Santos Bay	Aguilar-Rosas 2007	31º 43.2' N	116º 40.2' W
	2006	Santa Catalina Island	Miller 2007	33º 24.3' N	118º 22.0' W
	2006	Point Loma	UC Herbarium	32º 41.2' N	117º 16.0' W
	2007	San Clemente Island	UC Herbarium	32º 58.7' N	118º 32.3' W
	2007	Isla Natividad	Riosmena-Rodriguez 2012	27º 27.8' N	115º 9.00' W
	2009	Anacapa Island	D. Kushner, US Natl. Park Service	34º 0.91' N	119º 22.5' W
	2010	Santa Cruz Island	D. Kushner, US Natl. Park Service	34º 2.61' N	119º 42.9' W
	2010	Santa Barbara Island	D. Kushner, US Natl. Park Service	32º 28.7' N	119º 24.2' W
	2012	Mission Bay	this study	32º 45.7' N	117º 14.8' W
	2012	Shaw's Cove	UC Herbarium	33º 32.6' N	117º 47.9' W
	2013	Oceanside Harbor	this study	33º 12.4' N	117º 23.6' W
	2013	San Diego Bay	this study	32º 42.4' N	117º 14.1' W
	2013	Bird Rock	this study	32º 48.9' N	117º 16.5' W
U. pinnatifida	2000	Los Angeles Harbor	Silva 2002	33º 42.9' N	118º 17.0' W
	2000	Long Beach Harbor	Silva 2002	33º 45.7' N	118º 12.0' W
	2000	Channel Islands Harbor	Silva 2002	34º 9.71' N	119º 13.4' W
	2000	Port Hueneme	Silva 2002	34º 9.17' N	119º 12.5' W
	2001	Santa Barbara Harbor	Silva 2002	34º 18.5' N	119º 41.4' W
	2001	Santa Catalina Island	Silva 2002	33º 24.2' N	118º 22.1' W
	2001	Monterey Bay	Silva 2002	36º 36.2' N	121º 53.3' W
	2003	Isla Todos Santos	Aguilar-Rosas 2004	31º 48.1' N	116º 47.3' W
	2004	San Diego Bay	Miller 2009	32º 42.5' N	111º 10.4' W
	2009	Morro Bay Docks	UC Herbarium	35º 22.2' N	120º 51.4' W
	2009	San Francisco Bay	Zabin 2009	37º 46.8' N	122º 23.1' W
	2009	Pillar Point Harbor	Zabin 2009	37º 30.1' N	122º 28.9' W
	2013	Oceanside Harbor	this study	33º 12.4' N	117º 23.6' W
	2014	Santa Cruz Harbor	H. Fulton- Bennett, Moss Landing Marine Laboratory	36º 57.8' N	122º 0.08' W
	2014	Mission Bay	this study	32º 45.7' N	117º 14.8' W

characterized by distinct benthic functional groups. The major loadings on PC1 were fleshy red macroalgae and crustose coralline algae in the direction of open coast sites and sand and bare rock in the direction of jetties. Sites within each classification spread along PC2, which had major loadings of articulated coralline algae, brown macroalgae, turf algae, sponges, and seagrass. This spread indicates that cover of these benthic functional groups was variable at sites within the three site types.

Densities of native, non-native naturalized, and non-native stipes were clearly grouped along PC1 based on site type (Figure 5). Native brown algal stipe densities (Figure 5A) were high in open coast sites characterized by native fleshy red macroalgae and articulated coralline algae and low in harbor and jetty sites. Harbor and jetty sites had consistently high stipe densities of non-native naturalized *S. muticum* (Figure 5B). Non-native macroalgae (Figure 5C) were found almost exclusively in harbor sites that were

characterized by turf algae, articulated coralline algae, sponges, and barnacles.

Regional abundance and current distribution

In the relatively short invasion history of *S. horneri* and *U. pinnatifida* on the Pacific coast of North America, each species has spread rapidly to occupy a range of different habitats in multiple biogeographic regions with different environmental conditions (Figure 1, Table 3). Both species have been documented on man-made and natural substrates in protected harbors, open mainland coasts, and on offshore islands.

Since its discovery in Long Beach Harbor in 2003, *S. horneri* has shown a general southward spread, remaining in the southern California Bight and expanding southward down the coast of Baja California, Mexico (Figure 1, Table 3). In this time, it has expanded its range approximately 200 km north and 750 km south, from Santa Barbara, California to Isla Natividad, Central Baja California, Mexico.

While the first documentation of *Sargassum horneri* was in a harbor, this species has been found in few harbor locations since then. In 2010, *S. horneri* was found growing in the Port of Ensenada. In this study we report the occurrence of *S. horneri* in Oceanside Harbor, Mission Bay, and San Diego Bay. *Sargassum horneri*'s greatest invasion success has been on offshore islands along the coasts of California and Baja California. *Sargassum horneri* was first discovered at Santa Catalina Island in April 2006, and it was reported at San Clemente Island in May 2007. It has since spread to Anacapa and Santa Cruz Islands. In the south, the species has been found from the Coronado Islands in 2015 (N. Kaplanis, pers. obs.), to Isla Natividad, a small island off of the central Pacific coast of Baja California, Mexico in 2007. *S. horneri* has also successfully invaded open coast mainland locations in California and Baja California, Mexico. In 2005, *Sargassum horneri* was first reported as drift wrack at La Jolla, Baja California and growing at Rancho Packard in Todos Santos Bay, Ensenada B.C. In 2006, the first population in San Diego County was discovered at New Hope Rock, Point Loma. It has since been found in isolated populations along the southern California coast in Santa Barbara (D. Reed, University of California Santa Barbara, Santa Barbara, CA, pers. comm.), Laguna Beach, and Crystal Cove, Orange County. Our study adds a total of nine sites to the list of locations where this species is now present.

Undaria pinnatifida has primarily spread northward since its discovery in Los Angeles Harbor in March 2000, growing almost exclusively on man-made structures in protected harbor locations (Figure 1, Table 3). *Undaria pinnatifida* was reported in rapid succession at harbors throughout the California coast: Port Hueneme and Santa Barbara Harbor in November 2000 and April 2001, respectively; and as far north as Monterey Harbor by August 2001. In 2004 it was first found in San Diego Bay, and by 2009 the species was also found at Morro Bay Harbor, at Pillar Point Harbor in Half Moon Bay, and marinas in San Francisco Bay. *Undaria pinnatifida* was then found on floating structures in two marinas within the Bahía Todos Santos in April of 2012, and most recently was discovered in Santa Cruz Harbor in June of 2014 (H. Fulton-Bennett, Moss Landing Marine Lab, Moss Landing, CA, pers. comm.). In two instances *U. pinnatifida* has been found on natural substrates in island locations. In June of 2001, a deep water population was found in Button Shell Cove, an open-coast location on Santa Catalina Island. This documentation represents the first and only instance of *U. pinnatifida* occurring on a natural reef on the open coast in California. In September 2003, *U. pinnatifida* was found at Isla Todos Santos, the first documentation of this species on the Pacific coast of Mexico. *Undaria pinnatifida* has not yet been documented growing on a natural reef on the mainland Pacific coast of California. In Baja California though, populations have been observed in a natural reef setting at Punta Banda, Bahía Todos Santos (Aguilar-Rosas 2014). Here we document eight new sites from San Diego harbors where *U. pinnatifida* is present.

Discussion

We investigated the presence, establishment, spread and persistence of *S. horneri* and *U. pinnatifida* in San Diego County. Both species are well established, occurring throughout the county in multiple locations characterized by distinct habitats. Further, both species appear to be spreading locally within a short time frame to an increasing number of sites where they are found. Finally, the persistence of both species at invasion locations through multiple generations indicates that these species are established.

Sargassum horneri has proven to be a successful invader in San Diego, rapidly colonizing new areas, forming dense thickets and spreading quickly within invasion sites. This suggests that

it is competitively equal to, or dominant over, native macroalgal species when conditions are right. The life history characteristics of this species may explain its success as an invasive species. Like in its native range, in invasion locations *S. horneri* grows very rapidly between November and July, reaching full size (3–5 m in length) and reproductive maturity in nine to ten months (L. Marks, University of California Santa Barbara, Santa Barbara CA, pers. comm.; N. Kaplanis pers. obs.). *Sargassum horneri* is an annual species (Gao and Hua 1997) and is capable of persisting through multiple generations because it is monoecious and extremely fecund (Miller and Engle 2007). Once released, *S. horneri* eggs have the potential to be fertilized for up to 48 hours, a window of viability much longer than related species (Pang et al. 2009). In San Diego, mature senescent thalli bearing reproductive conceptacles have been observed in spring of 2014 and 2015 throughout the county as beach wrack and as drift (N. Kaplanis, pers. obs.). Whether these drifting thalli are capable of releasing viable embryos is unknown, but it appears likely that *S. horneri* is capable of local dispersal even without a human transport vector.

Undaria pinnatifida has remained a relatively inconspicuous invader in San Diego. Its spread has been slow, has been mostly confined to man-made substrates, and no obvious ecological effects of its colonization have yet been observed. However, this survey provides only a snapshot of *U. pinnatifida* in a relatively early stage of a potential invasion. More detailed studies that investigate the interactions of this invader with the native benthic community are needed to better understand and track the progress of this invasion along the Pacific coast of North America.

Both non-native species investigated here were found almost exclusively in harbors in San Diego County. In these harbors, densities of non-native macroalgae are high when densities of native macroalgae are low and vice-versa. This pattern may result from occupation by the non-native species of an open niche that is not suitable for the growth of native macroalgae, or may be due to competitive displacement by the invaders. The disproportionate presence of these species in harbors may be a result of these locations being initial points of introduction, suggesting boats as a vector for long distance transport. Once present in harbors, the invaders may remain restricted to these habitats or they may spread into adjacent open coast sites. Whether the rocky reefs of our study area are more resistant to invasion than harbors, or whether they have simply not been exposed to propagules of the non-native species remains to be determined. However, it appears that several offshore islands in southern California and in Baja California are highly susceptible to invasion. Whether these new open coast invasions are the result of El Niño associated conditions that have negatively impacted kelp communities, potentially opening space for invader colonization, is yet to be determined. More long-term monitoring in conjunction with experimental manipulations are needed to better understand the dynamics and potential impacts of these invaders along the Pacific coast of North America.

The results of our surveys also provide valuable insight into the distribution of the naturalized invader *S. muticum*, which was abundant at nearly every survey site. Unlike *S. horneri* and *U. pinnatifida, S. muticum* was abundant on open-coast jetties year round. *Sargassum muticum* was also abundant in low energy environments throughout San Diego's harbors, as well as high energy wave-swept intertidal and subtidal areas along the open coast. Further, *S. muticum* was found both in areas devoid of other macroalgae and intermingled with native macroalgal species. While *S. muticum* was ubiquitous, it was never found in dense canopy-forming stands, as it is observed in its native range (Deysher and Norton 1982) and was observed during its initial invasion of San Diego in the 1970's (P. Dayton, Scripps Institution of Oceanography, San Diego, CA, pers. comm., Ambrose and Nelson 1982). At present, it appears as though *S. muticum* has become naturalized in San Diego but little is known about how this species interacts with native benthic communities or the new invaders over time. Continued monitoring is needed to better understand the invasion ecology of these three non-native species.

Comparing patterns of invasion of these macroalgal species along the San Diego County coast to the broader coastal region provides important context to understanding patterns of spread. In San Diego County, *S. horneri* grows in large meadows in the local harbors. These harbor populations are similar to the extensive populations now observed on the leeward side of Santa Catalina Island, though their spatial extent is more confined by limited availability of suitable hard substrate. On the open coast of San Diego, *S. horneri* remains contained in small localized populations with small spatial coverage and lower densities. In the wave and current exposed areas along the west and southern coasts of Santa

Catalina, the Northern Channel Islands, and the southern California mainland, *S. horneri* has also not yet been observed to form large or persistent meadows. The mechanisms driving these patterns of establishment remain unclear but may be tied to wave and current exposure.

Despite *U. pinnatifida*'s reputation as an aggressive invader, the colonization pattern for San Diego, as with the rest of the Pacific coast of North America, has shown that *U. pinnatifida* is largely restricted to man-made structures in harbors. This is strikingly different from other invasion locations such as Australia and New Zealand, where widespread invasion on the open coast has prompted aggressive removal and control programs (Lonhart and Bunzel 2009). Instances where *U. pinnatifida* has invaded natural substrates on the open coast of California and Baja California remain rare despite fears that these observed populations are the beginning of a widespread and devastating invasion. The pattern of colonization along the Pacific coast of North America may be a result of a limited temperature tolerance (Aguilar-Rosas et al 2004; Miller and Engle 2009), an inability to become established in areas of high wave exposure (Miller and Engle 2009), or an inability to compete with native macroalgae for settlement space on the benthos – but these mechanisms have yet to be explored.

The spread of *S. horneri* and *U. pinnatifida* along the Pacific Coast of North America in the past two decades has been swift and reveals that these two species are capable of becoming invasive in a range of habitats within this region. Colonization of areas far from their native ranges indicates that these species are capable of utilizing a human-mediated transport vector. Distribution patterns suggest hull fouling of large commercial vessels as a likely vector for initial introduction and fouling of smaller recreational vessels as a vector for secondary spread. Further, their capability to spread locally from these initial points of introduction may also suggest secondary spread through sexual and asexual propagation. These two species have also proven to be highly versatile. While *S. horneri* has remained confined to the southern California Bight and the Baja California Coast, it has successfully colonized a wide range of habitat types in this region. *Undaria pinnatifida* has also proven capable of invading a variety of habitat types, and has expanded its range from Baja California to northern California, spanning across multiple distinct biogeographic provinces. Finally, the persistence of both species since their initial introductions indicates they are also able to withstand competition and with native algal species and grazing pressure from native herbivores.

The ecological and economic impacts of these seaweed invaders have yet to be explored. In its native range, *S. horneri* is known to influence a variety of different coastal environmental parameters including dissolved oxygen concentration, water flow, pH, and light conditions (Komatsu et al. 2007). It is also known to play an important ecological role in offshore waters, forming large, dense, drifting mats (Komatsu et al. 2007). In its native range, this species is an important biofilter that removes inorganic nutrients from mainland effluent discharges (Pang et al. 2009). The impacts of the large invasive stands and drifting mats of this species on the Pacific coast of North America on coastal environmental conditions and nutrient distributions remains unknown. Few studies have assessed the impacts of *U. pinnatifida* on native communities in other areas, and ecological effects of *U. pinnatifida* on native species have been variable based on invasion location. Further, little is known about how this species may affect the rocky reef communities of the Pacific coast of North America if it spreads further (Lonhart and Bunzel 2009).

The coastal communities of the Californias are currently undergoing invasion by multiple non-native macroalgae. The majority of these species have appeared in the past 30 years, and species such as *S. horneri* and *U. pinnatifida* are still in the early stages of the invasion process, providing the opportunity to gain insight into the early stages of algal invasions. Further, environmental shifts associated with climate change, including increases in the frequency and intensity of ENSO events, may be making the California and Baja California coasts more susceptible to invasion by non-native algal species through creating more space and reducing natural resistance (Miller et al. 2011). While the current distributions of these species may be confined by latitudinal temperature barriers, with the North Equatorial Current possibly confining the spread of *U. pinnatifida* south, and the California Current possibly confining the spread of *S. horneri* north, temperature shifts associated with climate change could potentially alter these barriers and allow for further spread of these species. Identifying the underlying mechanisms that facilitate or inhibit further spread is the next logical step in advancing our knowledge of the invasion ecology of these species.

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The following supplementary material is available for this article:

Table S1. Summary of surveys in San Diego County.

This material is available as part of online article from:
http://www.aquaticinvasions.net/2016/Supplements/AI_2016_Kaplanis_etal_Supplement.xls

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Rapid Communication

Range expansion of a non-native, invasive macroalga *Sargassum horneri* (Turner) C. Agardh, 1820 in the eastern Pacific

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Abstract

Sargassum horneri (Turner) C. Agardh, 1820 is a fast growing brown alga native to shallow reefs of eastern Asia. It has spread aggressively throughout southern California, USA, and Baja California, México since it was discovered in the eastern Pacific in 2003 and poses a major threat to the sustainability of native marine ecosystems in this region. Here we present a chronology of the rapid geographic expansion of *S. horneri* in the eastern Pacific and discuss factors that potentially influence its spread.

Key words: introduced species, invasion, distribution, seaweed, *Sargassum filicinum*, southern California, Baja California

Introduction

Introductions of marine non-native species continue worldwide and are expected to increase with the expansion of global trade. The spread and ecological effects of newly-established non-native species can vary; some proliferate and compete vigorously in their introduced range and are considered "invasive" (Miller et al. 2011). Introduced marine macroalgae are no exception, although detailed records of the geographic expansion of introduced marine macroalgae are rare (Lyons and Scheibling 2009) despite there being at least 277 introduced seaweed species globally (Williams and Smith 2007). Documenting the spread of these species can be challenging given the logistical difficulties associated with sampling in subtidal habitats where they occur (e.g. time- and depth-limitations when using scuba and the expense of accessing remote sites). Yet such studies are valuable for not only documenting their distributions but also providing insight into the mechanisms influencing the spread of non-native species.

Here we present the chronology of the geographic expansion of the non-native macroalga *Sargassum horneri* (Turner) C. Agardh, 1820 (Fucales) along the southern region of the Pacific

Figure 1. *Sargassum horneri* morphology and life cycle. (A) Recruit, (B) Mature thallus with reproductive receptacles indicated by arrow, (C) Thick canopy on a shallow reef. Photo credits: Jessie Alstatt (A), Dan Richards (B), Tom Boyd (C).

coast of North America, where it has spread rapidly since it was first detected in Long Beach Harbor, California, USA, in 2003 (Miller et al. 2007). We also discuss potential factors influencing the spread of this species and the implications of its invasion to native ecosystems.

Study area

The study area encompassed the shallow coastal waters of the eastern Pacific Ocean from northern California, USA, to the southern tip of Baja California, México. Much of this coast is actively monitored by government and academic researchers and citizen scientists, and is therefore an ideal region in which to document the spatio-temporal dynamics of the spread of an invasive macroalga.

Study species

Miller et al. (2007) initially identified the introduced population of *Sargassum* discovered in Long Beach, California as *S. filicinum* (Harvey, 1860). This annual brown alga is monoecious, with ellipsoidal pneumatocysts, and has a narrow geographic range on the coast of western Japan (Yoshida et al. 1983; Tseng et al. 1985) and southern Korea (Lee and Yoo 1992). On the basis of molecular population studies, Uwai et al. (2009) merged *S. filicinum* with *S. horneri*, a dioecious species with spherical pneumatocysts that is widespread in the warmer waters of eastern Asia (Tseng et al. 1985). Therefore, we refer to the eastern Pacific population as *S. horneri*.

The morphology of *S. horneri* changes throughout its annual, diplonic, life cycle. Embryos develop into small plants with lateral fern-like branches anchored by a common holdfast (Figure 1A). Plants give rise to a single erect frond up to several meters in length that bears numerous vegetative blades buoyed by many small gas bladders (Yoshida 1983). Eventually, the frond ceases vertical growth and develops hundreds of reproductive receptacles (Figure 1B). Fertilization occurs when sperm penetrate an egg inside a conceptacle positioned on the surface of a receptacle. The resulting embryo is released and settles to the bottom. After embryos are shed the frond senesces and the entire thallus dies, completing the life cycle. Sexual reproduction is the only known means of propagation.

Miller et al. (2007) recorded the presence of *S. horneri* in the eastern Pacific in southern California shortly after it was first discovered in 2003. Rapid communication, coupled with the species' conspicuous morphology and widely distributed

information on its identification, facilitated the subsequent monitoring of *S. horneri* by many researchers in California and Baja California.

Methods

We compiled records of *S. horneri* from herbaria, publications, government and academic groups and trained citizen scientists monitoring subtidal and intertidal reefs in California and Baja California (Supplementary material Table S1). Its presence or absence was recorded during ecological surveys by observers trained to identify the species. Because this region is extensively and regularly monitored by many trained observers, the spread of *S. horneri* can be described with high spatial and temporal resolution. Using these data, we present a timeline of *S. horneri* spread in southern California and Baja California.

Results

Since 2003 when *S. horneri* was first detected in Long Beach Harbor, it has spread north and south along the mainland coast and westward across several nearshore islands (Supplemental material Table S2, Figure 2). The geographic expansion of *S. horneri* is characterized by isolated introductions to new islands and locations on the mainland widely separated from existing populations, followed by the steady colonization of surrounding areas.

In 2005, just two years after *S. horneri* was first detected in Long Beach, it was found drifting on the surface 260 km south in Todos Santos Bay, Baja California, México. One year later it was confirmed to be growing on natural reefs there, and along the coast of San Diego and the leeward side of Santa Catalina Island, California. Since then it has progressively spread north in southern California and south in Baja California. By 2007, *S. horneri* had spread to Isla Natividad in Baja California, 500 km south of the nearest known population. In 2013, the northern range of *S. horneri* reached Santa Barbara, California, 186 km northwest of Long Beach. The known northern and southern limits of the range of established populations have not changed since 2013, though additional populations were recorded within the previously established range. However, individual thalli were found floating at the surface west of the current range at Santa Rosa and San Miguel Islands in 2012 and 2015 respectively, and at multiple islands near the southern end of its range in 2015.

The abundance and persistence of the recorded populations varied. Many reports consisted of only a few individuals or groups of individuals in small patches, often at sites where *S. horneri* had not previously been recorded. Patchy distribution continued in subsequent years at many sites, and occasionally *S. horneri* was recorded at a site but not found there again. However, in some areas, such as Santa Catalina and Anacapa Islands, *S. horneri* spread profusely and was persistent, covering large portions of reefs with adult densities > 100 m^{-2} and recruit densities > 1000 m^{-2} for multiple years (e.g. Figure 1C).

Discussion

Invasive traits

Sargassum horneri has several life history characteristics that make it well adapted for colonizing distant areas and rapidly populating an area once it is established. Thalli are buoyed by gas bladders and are capable of self-fertilization, making the establishment of new populations from long-range dispersal of a single floating thallus possible. Indeed, floating *S. horneri* thalli have been observed frequently off southern California and Baja California and are estimated to remain afloat for several weeks before decomposing (Yatsuya 2008). Local population growth can occur quickly because *S. horneri* is a fast-growing (4.46% day^{-1} adult blade weight maximum relative growth rate; Choi et al. 2008) and highly fecund alga (up to 50% of the biomass of a mature individual is composed of reproductive tissue; L. Marks unpublished data). Furthermore, the patchy distribution and reoccurrence of dense aggregations of *S. horneri* in successive years (Figure 1C) may be explained by the heavy embryos of *S. horneri* which, like other fucoid algae, are thought to have limited capacity for dispersal.

Dispersal vectors

The distribution and rapid spread of *S. horneri* is likely influenced by both natural and human-mediated dispersal. Reproductive thalli can become dislodged naturally if severed from their holdfast by grazers or strong wave action and carried to new sites on ocean currents. Divers may also dislodge thalli accidentally or intentionally, inadvertently contributing to its dispersal by either freeing them to float away or transporting them elsewhere. Boaters can dislodge thalli when setting and retrieving anchors lying in *S. horneri*-populated areas. *Sargassum horneri* is also adept

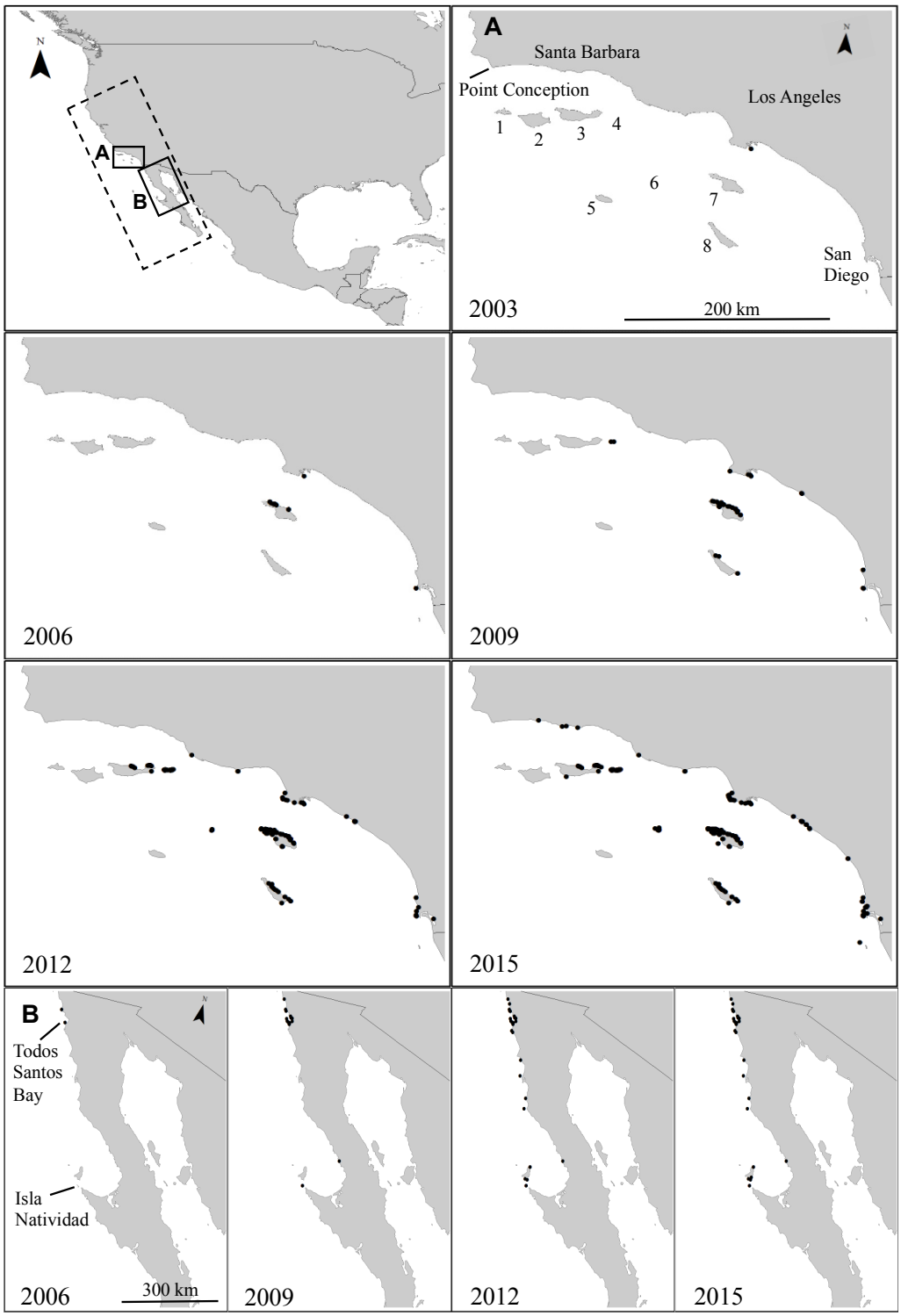

Figure 2. Chronology of geographic expansion of *S. horneri* in the southern California, USA (A) and Baja California, México (B) regions. Each dot identifies a location where *S. horneri* was found attached to the substrate at least once. Each map includes observations from all previous years to display the distribution of *S. horneri* at each interval. The California Channel Islands are identified by number as follows: 1. San Miguel, 2. Santa Rosa, 3. Santa Cruz, 4. Anacapa, 5. San Nicolas, 6. Santa Barbara, 7. Santa Catalina, 8. San Clemente. The entire study area is outlined by the dashed line. Maps were created by P. Carlson.

at growing on a variety of both natural and man-made surfaces, so vessels fouled with *S. horneri* may be an effective means of transporting it to new locations as suggested by Miller and Engle (2009). The current distribution of this seaweed includes many sites that are frequently visited by boaters and divers, such as harbors or anchorages, supporting the idea that *S. horneri* is being transported regionally by recreational and commercial vessels.

Potential for further spread

Sargassum horneri has expanded significantly further south along the eastern Pacific coast than north, spanning 6.18 and 0.76 degrees latitude from the initial detection site in Long Beach Harbor, respectively. The thermal tolerances of *S. horneri* may play an important role in determining range limits in the eastern Pacific. Sea surface temperatures in its native range in western Japan and southern Korea average between about 18–22° C (Chu et al. 1998). Baja California water temperatures typically range between 14–22° C on the Pacific coast (Zaytsev et al. 2003), so the continued expansion of *S. horneri* southward along this peninsula is likely. Warmer average temperatures in the Gulf of California and mainland México will likely prevent expansion beyond the peninsula. Ocean temperatures north of Point Conception rarely exceed 18°C, which may prevent *S. horneri* from spreading further north under present ocean climate conditions. However, predictions for a warmer ocean in the future may serve to increase the northward expansion of *S. horneri* in the eastern Pacific.

Implications of S. horneri invasion

Sargassum horneri can be locally very abundant and highly persistent. Therefore, its continued expansion in the eastern Pacific may pose a major threat to the sustainability of native marine ecosystems. Its high growth rates and long, floating thalli may provide a competitive advantage over other macrophytes. In addition, it appears to be avoided by most herbivores (Navarro 2009; Vogt 2010), possibly due to high concentrations of phenolic compounds that have been shown to deter grazing in other fucoid algae (Steinberg 1985). Mesoinvertebrates that use macroalgae as biogenic habitat and the fish that depend on these invertebrates may also be affected by the *S. horneri* invasion. Research investigating the interactions between *S. horneri* and ecologically important species is critically needed to understand how its invasion may be altering the structure and functioning of existing ecosystems of the eastern Pacific.

Continued monitoring of *S. horneri* distribution is essential to identify environmental factors influencing its spread and prioritize management actions. Researchers and citizen scientists can contribute to this effort by reporting observations of *S. horneri* occurrence to an online database and map designed to help track its spread (Marine Invasive Species Tracking website 2015).

Conclusion

The range of *S. horneri* has expanded rapidly in the eastern Pacific since it was first detected in 2003. Its expansion to the south has been more extensive and occurred more quickly than to the north, suggesting that it may be better suited to warmer southern waters. The prevalence of *S. horneri* at popular boating and diving destinations suggests that its spread is the result of multiple introductions. The life history of this species allows distant areas to be colonized by a single individual, which facilitates its spread. The high abundance and persistence of *S. horneri* in novel areas has heightened the awareness of its invasion potential and raised concerns about its possible adverse effects on existing ecosystems. Future research aimed at determining the environmental factors affecting its spread and the ecological and economic consequences of *S. horneri* invasion will provide much needed insight into the cost and need for human intervention in controlling its invasion.

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Supplementary material

The following supplementary material is available for this article:

Table S1. Sources for records of *Sargassum horneri* occurrence.

Table S2. Records of the occurrence of *Sargassum horneri* in California, USA, and Baja California, México, since 2003, the year it was first discovered in the eastern Pacific.

This material is available online for download from Long Term Ecological Research Network Data Portal (see Marks et al. 2015, http://dx.doi.org/10.6073/pasta/63012c4e436214239ebed11ee57cbe03)

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Research Article

Assessment of control methods for the invasive seaweed *Sargassum horneri* in California, USA

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Editor's note:

This study was first presented at the 9th International Conference on Marine Bioinvasions held in Sydney, Australia, January 19–21, 2016 (http://www.marinebioinvasions.info/previous-conferences). Since their inception in 1999, ICMB series have provided a venue for the exchange of information on various aspects of biological invasions in marine ecosystems, including ecological research, education, management and policies tackling marine bioinvasions.

Abstract

Determining the feasibility of controlling marine invasive algae through removal is critical to developing a strategy to manage their spread and impact. To inform control strategies, we investigated the efficacy and efficiency of removing an invasive seaweed, *Sargassum horneri,* from rocky reefs in southern California, USA. We tested the efficacy of removal as a means of reducing colonization and survivorship by clearing *S. horneri* from 60 m^2 circular plots. We also examined whether *S. horneri* is able to regenerate from remnant holdfasts with severed stipes to determine whether efforts to control *S. horneri* require the complete removal of entire individuals. The experimental removal of *S. horneri* in early winter, just prior to the onset of reproduction, reduced recruitment in the next generation by an average of 54% and reduced survivorship to adulthood by an average of 25%. However, adult densities one year after clearing averaged 83% higher in removal plots and 115% higher in control plots. We attribute these higher densities to anomalously warm water associated with the 2015–16 El Niño that reduced native canopy-forming algae and enhanced the recruitment and survival of *S. horneri*. We did not find any evidence to suggest that *S. horneri* has the capacity to regenerate, indicating that its control via removal does not require the tedious task of ensuring the removal of all living tissue. We developed efficiency metrics for manual removal with and without the aid of an underwater suction device and found the method with maximum efficiency (biomass removed $worker^{-1}$ hr^{-1}) varied based on the number of divers and surface support workers. Our findings suggest that controlling *S. horneri* via removal will be most effective if done over areas much larger than 60 m^2 and during cool-water years that favor native algae. Such efforts should be targeted in places such as novel introduction sites or recently invaded areas of special biological or cultural significance where *S. horneri* has not yet become widely established.

Key words: introduced species, management, marine, macroalgae, rocky reef, *Sargassum filicinum*

Introduction

Invasive species are one of the greatest agents of human-induced change to ecosystems worldwide (Pejchar and Mooney 2009). Coastal marine systems are especially vulnerable to introductions of nonindigenous species via trans-oceanic shipping, aquaculture and the aquarium trade, which have greatly extended the distribution of many marine species outside of their native ranges (Carlton 1989). Marine invasions have steadily increased over the past two centuries (Ruiz et al. 2000) and are expected to continue to rise as global trade expands. Costs associated with the impact and management of invasive species are high, totalling over $1 billion annually in the USA

(Pimentel et al. 2000), while resources available for management are limited. Therefore, agencies tasked with controlling invasions must be efficient in their management strategies. Exploration of techniques aimed at controlling the spread and impact of marine invasive species and identification of species-specific traits that increase the efficacy of control are urgently needed.

A seaweed recently introduced to southern California, USA, presented an opportunity to test the efficacy of removal in controlling invasive algae on rocky reefs. *Sargassum horneri* (Turner) C. Agardh, 1820 (Fucales) is a large, annual brown alga native to shallow reefs of eastern Asia. It was first discovered in the eastern Pacific in Long Beach Harbor in 2003 and identified as *S. filicinum* Harvey, 1860 (Miller et al. 2007), now considered a synonym of *S. horneri* (Uwai et al. 2009). The species has spread aggressively across 700 km from Santa Barbara in southern California to Isla Natividad in Baja California, Mexico (Marks et al. 2015). It occurs primarily at offshore islands though it has also been found along the mainland and in coastal embayments. In southern California we have observed *S. horneri* growing in the intertidal down to 33 m depth, with its highest densities occurring between 5–15 m. In places where *S. horneri* is established, juveniles can attain high cover with upwards of 1,000 individuals m^{-2} during the summer and fall, and these grow to form thick canopies in the winter with dense stands of over 100 adults m^{-2} (author's unpublished data). While definitive evidence of ecological impacts on rocky reef systems from *S. horneri* invasion is not yet available (but see Cruz-Trejo et al. 2015), the detrimental effects on native assemblages caused by other invasive seaweeds (e.g., de Villèle and Verlaque 1995; Levin et al. 2002; Casas et al. 2004; Britton-Simmons 2004) suggest management of *S. horneri* is worth exploring (Anderson 2007; Schaffelke and Hewitt 2007; Forrest and Hopkins 2013).

Several life history characteristics of *S. horneri* make it potentially suitable for control by removal. First, it is a large and conspicuous alga consisting of a single main axis with multiple lateral branches that reaches up to several meters high (Yoshida 1983). The annual thallus is anchored by a small holdfast that gives rise to a stipe buoyed by many small gas bladders (Marks et al. 2015). The conspicuous adult thalli allow for efficient identification and removal by divers using SCUBA. Second, *S. horneri* propagates via sexual reproduction. Fertilization occurs in winter on the surface of reproductive structures born on the lateral branches of a mature thallus where embryos are developed and shed (author's unpublished data). Senescence of the thallus ensues after embryos are shed, completing the annual life cycle. *Sargassum* embryos tend to sink quickly (Gaylord et al. 2002) and the vast majority likely settle within a few meters of the parent thallus (Deysher and Norton 1982; Stiger and Payri 1999; Kendrick and Walker 1995). Clearing thalli in relatively small areas on the order of tens of square meters may therefore reduce colonization resulting from local dispersal. However, because colonization over longer distances is thought to occur via reproductively mature thalli that are dislodged and set adrift (Yatsuya 2008), any thalli removed must not be released. Asexual reproduction in *S. horneri* via fragmentation or regeneration from remnant tissue has not been studied, although it is known to occur in other fucoid species (McCook and Chapman 1992; Fletcher and Fletcher 1975). Information on the capacity of *S. horneri* to propagate asexually is needed to develop an effective management strategy for controlling its spread.

A new tool that has been developed to help control algal invasions is an underwater suction device. This type of device has been used on coral reefs in Oahu, Hawaii, to reduce densities of invasive algae (Conklin and Smith 2005), and a similar device was recently developed to aid in controlling seaweed invasions on rocky reefs in California. The device has been used to transport *S. horneri* removed from the ocean floor by divers to a platform at the sea surface, where the material can be collected for disposal on land (Meux 2013). However, the effectiveness of this approach in controlling *S. horneri* on temperate rocky reefs and how the efficiency of this method compares to non-mechanical techniques require further investigation.

To inform efforts to manage the spread and impact of *S. horneri*, we removed it from experimental areas and followed colonization and survivorship for one year to address three questions. First, how effective is local removal in controlling populations of *S. horneri*? Second, what is the capacity of the species to regenerate from remnant holdfasts? Third, how much effort is required to remove established populations with and without the aid of an underwater suction device?

Methods

This study was performed on the leeward side of Santa Catalina Island, California, USA on two nearby reefs (Howland Landing: 33.465ºN; 118.522ºW and Lion Head: 33.453ºN; 118.502ºW) at 6–8 m depth (Figure 1). We chose these locations because they are representative of the topography of reefs in the area, and have dense populations of *S. horneri*.

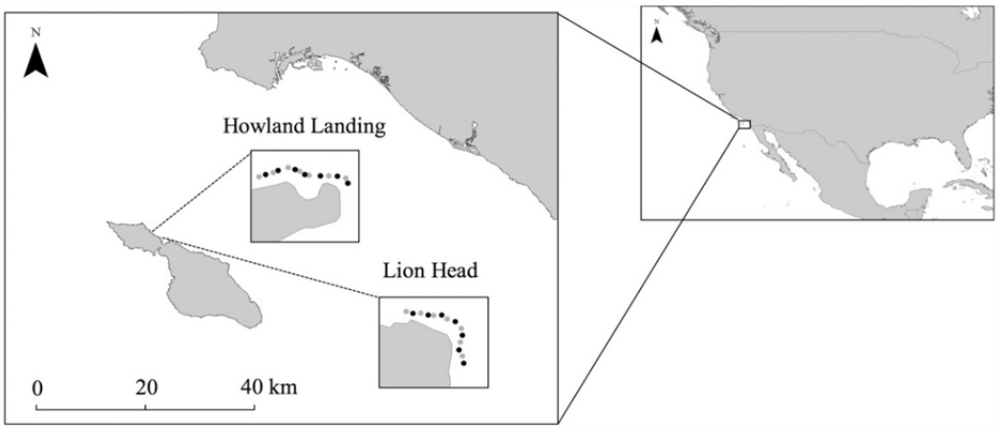

Figure 1. Map of Santa Catalina Island, located 27 km off the coast of southern California, USA. The insets show the distribution of 28 experimental plots spread across two sites: Howland Landing and Lion Head. Dark circles represent removal plots, and grey circles represent control plots.

Removal experiment

To evaluate the effectiveness of *S. horneri* extraction in reducing local populations, we performed a removal experiment and monitored colonization and survivorship of the next generation. We established twenty-eight 60 m^2 circular plots in areas where *S. horneri* was abundant and assigned plots alternately to either a removal or non-removal (i.e., control) treatment (Figure 1). Fourteen plots were located 15–20 m apart at each of the two study sites.

We extracted *S. horneri* from removal plots in the winter (February 2015) when individuals were at their largest size and lowest densities, but before the vast majority (i.e., 99%) of them became fertile so as to minimize the source of *S. horneri* propagules within the removal plots. Immediately prior to removal we counted the number of *S. horneri* adults (defined as > 5 cm tall) in sixteen 0.25 m^2 quadrats $plot^{-1}$ that were placed within each plot at 0, 1, 2 and 3 m from the edge along two perpendicular diameters. To prevent mature thalli from drifting away and starting distant populations, we captured all material removed and transported it to boats anchored at the surface. On deck, workers immediately transferred material into heavy-duty trash bags. We later emptied these bags at an upland location where we left the algae to decompose.

We removed all *S. horneri* from the substrate manually and employed one of two methods to transport it to the surface: mesh bags and lines, or an underwater suction device. The bag and line method involved divers placing *S. horneri* into weighed bags (Figure 2A). Once filled, buoyant bags were released from their weights and attached to lines hanging off the side of the boat (Figure 2B) and a worker at the surface hauled them onboard. The suction device consisted of a mechanical water pump (Subaru PTX201D Robin Pump) with 7.6 cm-diameter input and output hoses that is operated on the deck of the boat (Figure 2C). Divers fed material into the hose at depth and it was transported to the surface by the movement of a diaphragm (Figure 2D). Regardless of the method used, most individuals were completely removed from the substrate (Figure 2E). However, the holdfasts of some individuals remained after their stipes were severed.

Removal plots were resampled immediately after clearing to confirm all thalli had been removed and to quantify the density of remnant holdfasts. In September 2015, we measured colonization by counting the number of juveniles (defined as < 5 cm tall) in all plots. In February 2016, one year after experimental removals, we counted the number of adults in each plot to assess the effects of removal on population density. Because *S. horneri* grows on rock and the percent cover of rock was consistently high but slightly variable (mean ± SE = 97.9 ± 0.19%) we adjusted estimates of density within each quadrat by the percent cover of rock in that quadrat. Hence *S. horneri* is reported as number m^{-2} of rock rather than number m^{-2} of sea floor.

We tested the effects of removal on colonization (i.e., juvenile density in September 2015) and population density (i.e., adult density in February 2016) in separate two-way hierarchical ANOVAs with treatment (removal versus control) as a fixed factor and site (Howland Landing versus Lion Head) as a random factor and plots nested within sites. We considered plots independent replicates of treatment effects in cases when the random effect of site was not significant.

Fate of individuals with severed stipes

To determine whether severing a *S. horneri* stipe near its base while leaving the holdfast intact is sufficient to prevent it from regenerating, we followed the fate of individuals after cutting their stipes in March 2015. We attached identifying markers to the reef adjacent to 80 holdfasts and revisited the marked individuals monthly for four months to record whether they remained attached to the substrate and, if so, whether they regenerated new tissue. We also collected observations of the remnant holdfasts in the plots we cleared. Although we were not able to follow these holdfasts individually, we looked for perennating *S. horneri* holdfasts when resampling the plots.

Efficiency of removal

We evaluated the efficiency of removal with and without the aid of the suction device (Figure 2) by quantifying the effort required for each method for a given quantity of *S. horneri* biomass. We did this by recording the removal method being used (i.e., suction device or bags and lines), time spent collecting, number of workers (i.e., scuba divers and surface support person) and amount of biomass removed for each dive. To estimate the biomass removed, we collected the algae into bags as soon as it was brought to the surface and weighed it to the nearest 0.5 kg using a hanging scale. In addition, we measured the rate of transport to the surface using the suction device across a range of stipe lengths to determine if size affected performance. We fed 30 pieces of several stipe lengths that are often naturally observed (30 cm, 60 cm, 100 cm and 150 cm) into the hose and recorded the time it took to bring them up to the surface.

Results

Removal experiment

The density of adult *S. horneri* prior to experimental removal in February 2015 was similar in removal and control plots ($F_{1,1} = 0.98$, $p = 0.504$) averaging 46.4 and 50.4 individuals m^{-2}, respectively (Figure 3A). Adult density differed significantly between the two sites ($F_{1,420} = 26.95$, $p < 0.001$) with density ~55% higher at Howland Landing. Quadrat sampling and visual surveys of entire plots verified that experimental clearing resulted in the removal of virtually all visible thalli in removal plots, but some holdfasts with severed stipes remained. The density of remnant holdfasts immediately after clearing was 46.1% of the initial adult population (mean ± SE = 22.3 ± 2.9 m^{-2}).

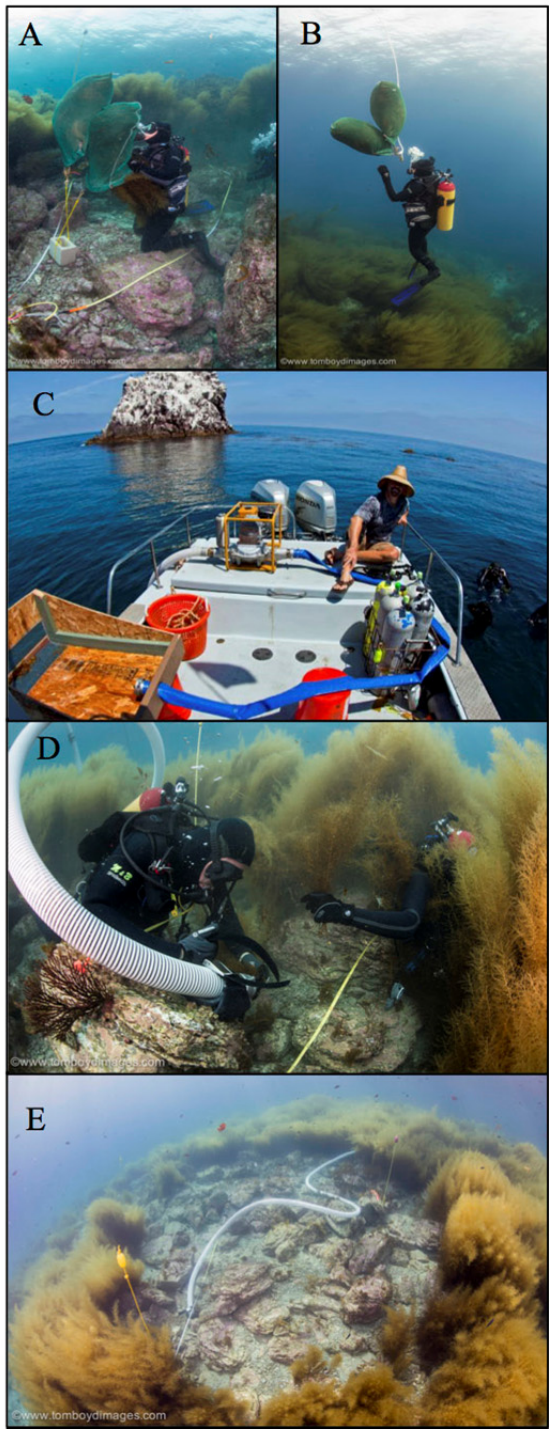

Figure 2. Two methods used to transport *Sargassum horneri* to the surface. Using the bag and line method, a diver fills bags anchored by a cinderblock (A), then clips bags to a line hanging from a boat anchored overhead (B). Using the suction device method, two divers work together to feed *S. horneri* into the hose (C), and a person at the surface collects the material from a sorting table after inspecting it for bycatch (D). After clearing using both methods, plots were left barren of *S. horneri* (E). Photo credits: Tom Boyd (A-B, D-E), Adam Obaza (C).

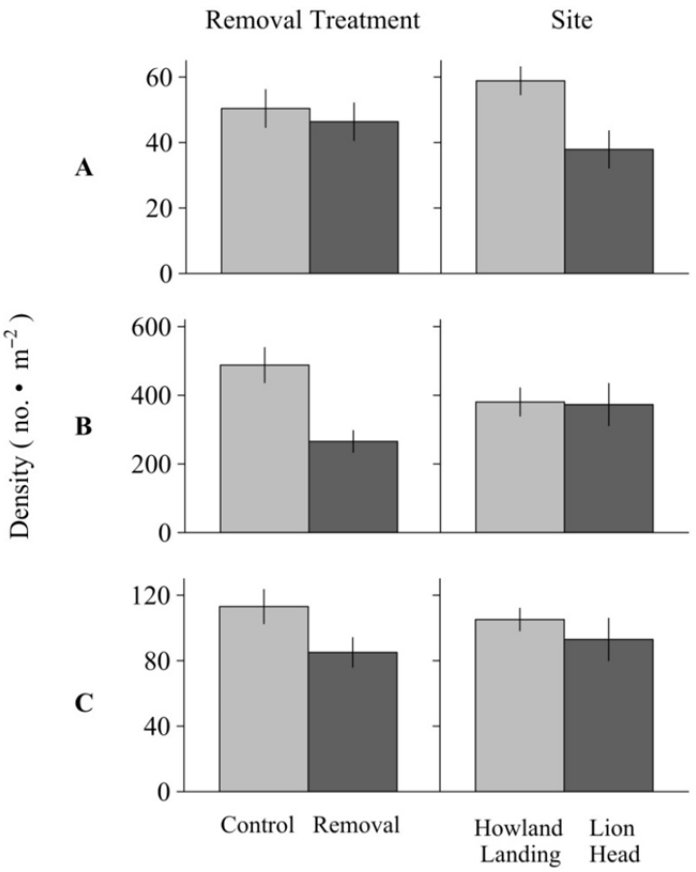

Figure 3. Results of removal experiment showing the average density ± SE of *Sargassum horneri* (A) adults prior to their removal, (B) juveniles ~220 days after removal, and (C) adults ~366 days after removal (N = 14 plots).

Similarly high densities of recently colonized juveniles were observed in all plots in September 2015, ~7 months after clearing (Figure 3B; $F_{1,420} = 0.08$, $p = 0.775$). Removal had a significant effect on subsequent colonization ($F_{1,26} = 12.95$, $p = 0.001$) as juvenile density was 54% lower in removal plots compared to control plots. The effect of removing *S. horneri* on colonization by juveniles was similar at both sites (treatment x site: $F_{1,1} = 0.236$, $p = 0.125$).

The reduced densities in removal versus control plots persisted but became less pronounced over time as juveniles grew into adults (Figure 3C). By February 2016, one year after clearing, adult densities averaged 25% lower in removal plots compared to control plots. However, overall adult densities were 83% higher in removal plots and 115% higher in control plots compared to February 2015 prior to removal (Figure 3A versus 3C).

Fate of individuals with severed stipes

Significant tag loss resulted in reduced and unequal sample sizes for estimating survivorship on the different sampling dates, which compromised our ability to quantitatively evaluate the regenerative capacity of individuals with severed stipes. Nonetheless, the data that we collected indicate that *S. horneri* has little or no capacity for regenerating from remnant holdfasts as none of the individuals with severed stipes that remained tagged generated new tissue. Fifty-six of the 80 tags remained after 31 days and remnants of holdfasts were found for only 20 of these 56 individuals. Remnants of 10 of 14, 4 of 9 and 0 of 8 holdfasts remained after 54, 85 and 113 days, respectively (Figure 4). Furthermore, when we sampled the removal experiment in September 2015, we found no remnant holdfasts, which suggests they had all senesced and disappeared within seven months.

Efficiency of removal

The efficiency of removing *S. horneri* varied by the method used to transport it to the surface and the number of workers. Three workers using the bag and line transport method yielded the slowest average removal rate of 29 kg worker^{-1} hr^{-1}, while the suction device method with three workers (two divers and one surface support person) yielded an average of 38 kg

worker^{-1} hr^{-1} (Figure 5). Limits on the amount of material that can be fed into the hose at any given time resulted in two divers being the optimum number to maximize the transport of algae to the surface. By contrast, the manual transportation method using bags and lines allowed for more divers to work efficiently in the same area. While the overall rate of removal using bags and lines increased with the number of workers, the maximum per capita efficiency was about 45 kg worker^{-1} hr^{-1} (Figure 5). The rate of transport using the suction device was highest at intermediate stipe lengths (~60 cm; Figure 6).

Discussion

Our results show that the experimental removal of *S. horneri* reduced the local population in the next generation by ~25% relative to control plots. However, despite this reduction, removing *S. horneri* did not lead to a decline in population density relative to the previous year as adult densities in both the removal and control plots were substantially greater in 2016 than in 2015 prior to removal. These results highlight some of the challenges associated with efforts to reduce established populations of *S. horneri* via removal. Moreover, they suggest that measurable success using removal techniques as a means of controlling *S. horneri* will likely require that removals be done over much larger areas to ensure an adequate reduction in propagule supply, which will be costly. The effect of removing *S. horneri* on its abundance in subsequent generations (as measured by the difference in *S. horneri* density between control and removal plots in the year following removal) was most apparent during the fall when the majority of individuals were juveniles, and became less pronounced in the winter when most were adults. The order of magnitude higher densities that we observed for juveniles compared to adults is consistent with self-thinning induced by intra-specific competition, which is common in large brown algae (Schiel and Choat 1980; Schiel 1985; Dean et al. 1989; Reed 1990). The dampened effect of removal between the juvenile and adult phases suggests removal accelerated the self-thinning process.

The increased density of *S. horneri* that we observed in our removal and control plots may have been due to the unusually warm water resulting from the 2015–16 El Niño. The native canopy-forming kelps *Macrocystis pyrifera* and *Eisenia arboria* commonly found on shallow reefs of Santa Catalina Island thrive in cool, nutrient-rich water. These species largely disappeared from the leeward side of the island during our study while *S. horneri* flourished, as did other species with warm water affinities (e.g.,

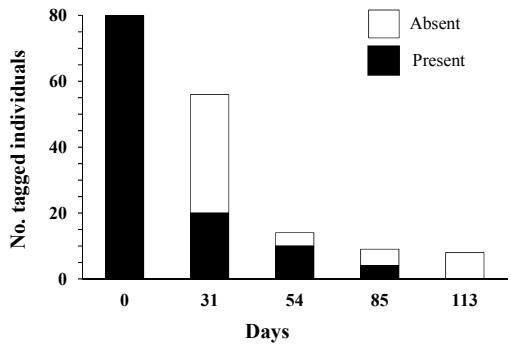

Figure 4. Survivorship of *Sargassum horneri* with severed stipes. Solid bars represent the number of thalli with remnant tissue remaining. Open bars represent the number of tags relocated where holdfasts had senesced. Combined, the bars represent the total number of tags found, and the number of individuals upon which survivorship was based for each sampling period.

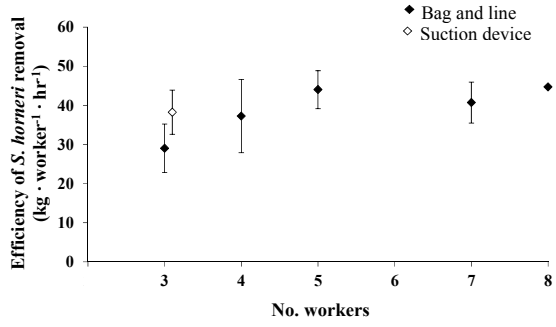

Figure 5. *Sargassum horneri* average removal rate (kg wet biomass worker^{-1} hr^{-1}) ± SE reported for each removal method. Replication varies by the number of dives with each given number of workers using each method. N = 15 dives with 3 workers using the suction device, and N = 6, 4, 6, 6 and 1 dives with 3, 4, 5, 6, and 8 workers using the bag and line removal method, respectively.

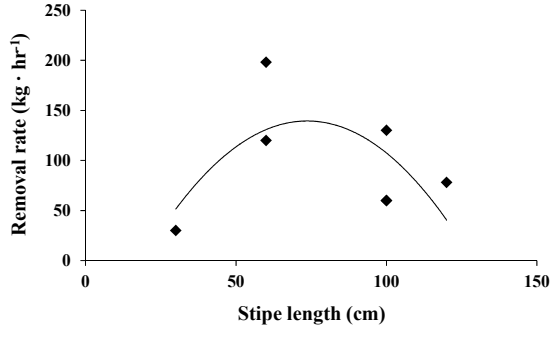

Figure 6. The rate (kg wet biomass hr^{-1}) at which stipes of *Sargassum horneri* were transported by workers using the suction device as a function of stipe length.

Zonaria farlowii, *Dictyota* spp. and *Dictyopteris undulata*). Evidence from the nonindigenous congener *Sargassum muticum,* which became abundant at Santa Catalina Island for several years following the El Niño of 1976 (Coyer 1979), suggests that *Sargassum* spp. with warm-water affinities decline once cooler waters return and large, perennial native kelps become re-established (Ambrose and Nelson 1982) Whether *S. horneri* declines over time remains to be seen, but if the warming observed in 2015–16 is a preview of future conditions, then tropicalization of an algal assemblage that favors *S. horneri* may be the norm.

The efficacy of removing invasive algae could be strengthened by selecting conditions under which native species can exert biotic control on the remaining population, or even by enhancing these controls. Researchers in Hawaii attributed their success in controlling invasive *Eucheuma* spp. and *Kappaphycus* spp. on patch reefs to introducing urchins after performing removals (Conklin and Smith 2005). Once divers reduced the algae below a critical threshold, the herbivores were able to prevent it from growing back. While this is an effective strategy on coral reefs where indiscriminant grazing is acceptable, introducing generalist herbivores is not a viable strategy to control invasive algae on temperate rocky reefs, which are often dominated by a diversity of macroalgae.

An alternative strategy to enhance biological resistance to the regrowth of invasive algae on rocky reefs is to perform removals under conditions favoring the colonization of native species of macroalgae and sessile invertebrates that compete for space and/or light. Resource competition is recognized as an important mechanism structuring communities (MacArthur 1970; Levine and D'Antonio 1999; Tilman 2004), and competition for space and light plays a key role in organizing the benthic community on rocky reefs (Miller and Etter 2008; Arkema et al. 2009). The invasion of a community is thought to be inversely related to species richness due to the enhanced ability of resident species to preempt resources (Elton 1958), and manipulative field experiments have shown that decreasing native diversity increases limited resources and the abundance and survivorship of non-native species in subtidal benthic communities. For example, Stachowicz et al. (2002) found that experimentally increasing sessile invertebrate species richness decreased both the availability of space, the limiting resource in this system, and the abundance of non-indigenous ascidians by buffering against temporal fluctuations in the cover of individual native species. Furthermore, multiple resources might be limiting the success of a non-native species throughout its life cycle, and higher functional diversity may allow a community to preempt multiple resources more effectively. A native algal community with crustose and turfing algae preempting space and understory and canopy-forming algae preempting light sequentially suppressed the recruitment and survivorship of the nonindigenous seaweed *Sargassum muticum* (Britton-Simmons 2006). The preemption of limited resources by native species of algae and invertebrates in areas where *S. horneri* has been removed could likewise limit *S. horneri's* ability to re-establish.

Another important factor to consider when controlling invasive algae through removal is the mechanisms by which it recolonizes cleared areas. Many species of invasive algae have the ability to regenerate from miniscule amounts of tissue (e.g., Fletcher and Fletcher 1975; McCook and Chapman 1992) and this characteristic presents a challenge when considering control via removal (Smith 2015). We found no evidence that *S. horneri* has the capacity to regenerate from remnant holdfasts. This suggests that severing stipes, which is far less time consuming than carefully scraping all tissue from the reef, would be an effective and efficient means of reducing *S. horneri* abundance.

Whether an underwater suction device, such as the one tested in this study, would be the preferred method for invasive algae control depends on staff and budget limitations. The bag and lines method is optimal when many workers (i.e., > two divers and one surface support worker) are available. It also requires minimal training and material costs, and so may be preferred with constrictive budgets. A suction device minimizes surface support effort, particularly associated with lifting heavy bags, and offers increased efficiency with a limited number of workers (< 3 divers). Drawbacks of using a suction device include increased start-up costs, logistical challenges associated with equipment transportation and maintenance, and limitations on working depths. In addition, significant time can be spent troubleshooting, such as identifying appropriately sized pieces of algae to reduce the frequency of clogs. However, removal efficiency is likely to improve as operators become more familiar with the device and alter equipment to better suit the target species. Workers in Hawaii designed several models using different kinds of pumps until they identified the optimal configuration for their target species (Conklin personal communication). Therefore, long-term efficiency gains may make a suction device preferable if an extended control effort is expected.

Eradicating problematic species from their novel habitats is most likely to be successful if attempted before they become widely established (Myers et al.

2000; Bax et al. 2003; Hulme 2006). *Caulerpa taxifolia*, a green alga native to the Indo-Pacific region, was introduced in two protected embayments in southern California in 2000 and a rapid response effort successfully eradicated this species (Anderson 2005). The appearance of *S. horneri* off the open coast of North America is the first record of this species outside of its native range in Asia (Marks et al. 2015). While the aggressive spread of *S. horneri* throughout southern California and Baja California, Mexico makes total eradication in this region highly unlikely, *S. horneri* has the potential to spread to other temperate reefs around the globe. Knowledge about the life history and effective methods for controlling *S. horneri* abundance will prepare resource managers in other regions to eradicate new populations before they become widely established. Our study is one of the first on targeted control of an invasive species on the open coast of California. Development of a removal protocol along with awareness generated by this work will better prepare resource managers and the general public for future invasions of *S. horneri* in other regions.

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Supplemental material

The following supplementary material is available for this article:

Table S1. Recruitment and survivorship of *Sargassum horneri* following removal

Table S2. Survivorship of *Sargassum horneri* with severed stipes

Table S3. Per capita removal rate of *Sargassum horneri*

Table S4. Transport rate of *Sargassum horneri* using suction device

This material is available online for download from the Long Term Ecological Research Network Data Portal, http://dx.doi.org/10.6073/pasta/a812d149f4d6e9cd5662d4c44eaedd22

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Article

Niche Complementarity and Resistance to Grazing Promote the Invasion Success of *Sargassum horneri* in North America

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Abstract: Invasive species are a growing threat to conservation in marine ecosystems, yet we lack a predictive understanding of ecological factors that influence the invasiveness of exotic marine species. We used surveys and manipulative experiments to investigate how an exotic seaweed, *Sargassum horneri*, interacts with native macroalgae and herbivores off the coast of California. We asked whether the invasion (i.e., the process by which an exotic species exhibits rapid population growth and spread in the novel environment) of *S. horneri* is influenced by three mechanisms known to affect the invasion of exotic plants on land: competition, niche complementarity and herbivory. We found that the removal of *S. horneri* over 3.5 years from experimental plots had little effect on the biomass or taxonomic richness of the native algal community. Differences between removal treatments were apparent only in spring at the end of the experiment when *S. horneri* biomass was substantially higher than in previous sampling periods. Surveys across a depth range of 0–30 m revealed inverse patterns in the biomass of *S. horneri* and native subcanopy-forming macroalgae, with *S. horneri* peaking at intermediate depths (5–20 m) while the aggregated biomass of native species was greatest at shallow (<5 m) and deeper (>20 m) depths. The biomass of *S. horneri* and native algae also displayed different seasonal trends, and removal of *S. horneri* from experimental plots indicated the seasonality of native algae was largely unaffected by fluctuations in *S. horneri*. Results from grazing assays and surveys showed that native herbivores favor native kelp over *Sargassum* as a food source, suggesting that reduced palatability may help promote the invasion of *S. horneri*. The complementary life histories of *S. horneri* and native algae suggest that competition between them is generally weak, and that niche complementarity and resistance to grazing are more important in promoting the invasion success of *S. horneri*.

Keywords: introduced species; biological invasion; macroalgae; canopy shading; competition; herbivory; *Sargassum filicinum*

1. Introduction

Marine ecosystems are increasingly threatened by invasive species as global trade expands and human-mediated introductions via commercial shipping occur at escalating rates [1–5]. Developing a predictive understanding of factors influencing the success of marine invasive species has clear implications for managing their spread and impacts. Yet relative to terrestrial systems, little is known about the ecological processes that influence marine invasions [6,7]. In terrestrial ecosystems, once an introduced species becomes established, biotic interactions with native species can play a major role in limiting population growth, spread and ecological impacts [8–11]. These interactions can either

promote or inhibit "invasion", here defined as the process by which an exotic species exhibits rapid population growth and spread in the novel environment [12].

In terrestrial and freshwater plants, biotic interactions such as competition with natives and herbivory can affect invasion success [9,13]. Competition for limited resources among native and invasive species is expected to be most intense when they have similar life histories and resource requirements [14–16]; invasion is promoted when exotic plants employ resource acquisition strategies superior to native competitors, reducing their abundance or diversity [17]. Invasion success can also be promoted when exotic species have functional traits or resource requirements that differ from the native biota, which allows them to take advantage of underutilized resources in space and time [16,18–21]. Such niche complementarity can facilitate invasions by allowing exotics to avoid interacting with natives that have superior competitive abilities. Like native plants, native consumers can promote or hinder invasion depending on their dietary preference. For example, herbivores that prefer exotic plants to natives can inhibit invasion, while those that prefer native plants can facilitate invasion by reducing the strength of competition between exotic and native plants [10,22,23]. Studies aimed at determining the mechanisms affecting the invasiveness of exotic marine macrophytes are needed to derive meaningful generalizations about the role of biotic interactions in influencing the invasibility of a wide range of ecosystems.

The Asian brown alga *Sargassum horneri* (Turner) C. Agardh, 1820 (Fucales) was first detected in California in 2003 [24] and has since spread throughout southern California and Baja California, Mexico [25]. Several life history characteristics of *S. horneri* are typical of "weedy" invaders with r-selected traits including broad habitat requirements and high fecundity with >60% of its biomass dedicated to reproductive tissue at its peak fertility [26,27]. It has highly localized propagule dispersal, as well as the ability to disperse long distances via the dislodgement and drifting of buoyant fertile adults [27]. The biomass of *S. horneri* is strongly seasonal: juveniles prevalent in the summer exhibit rapid growth to several meters in height during the winter, and reproduction and biomass peak in the spring [27]. *S. horneri* has the potential to compete with native algae by reducing the amount of light reaching algae growing beneath its canopy. Throughout the invaded range, *S. horneri* has become a dominant macroalga in some areas, but remains rare in others [7,25]. However, it is unclear whether this dominance results from competitive displacement of native species or opportunistic occupation of an underutilized niche.

During its reproductive phase, *S. horneri* can form dense canopies that shade the bottom, and canopy shading by invasive algae has been shown to cause the decline or exclusion of native seaweeds [28–30]. However, it has been hypothesized that the invasion of *S. horneri* is suppressed in areas dominated by native algae [7], suggesting that niche complementarity rather than competitive superiority accounts for its rapid spread in North America. Detailed information on patterns of distribution of *S. horneri* and native algae across space (e.g., depths) and through time (e.g., seasons) can provide valuable insight into the relative importance of competition versus niche complementarity in accounting for the invasion success of *S. horneri*.

The effects of herbivores in structuring temperate marine communities are well documented [31–33], but less is known about their potential role in influencing invasions. Exotic seaweeds with traits that deter herbivory (i.e., structural or chemical defenses) can gain an advantage over native competitors in areas with high grazing pressure. Such may be the case for *S. horneri* as it is in the order Fucales, which is known for having high levels of phenolic compounds that deter grazing [34–36]. Thus, preferential consumption of less defended native algae such as laminarian kelps [36,37] could facilitate the spread of *S. horneri* by weakening competition with other more palatable native algae.

The purpose of this study was to determine the degree to which competition, niche complementarity and herbivory account for patterns of abundance of *S. horneri* in an area where it has become established. To do this, we documented patterns of co-occurrence between *S. horneri* and native algae spatially across a depth gradient and temporally over multiple years in experimental plots with *S. horneri* removed or left intact to evaluate niche complementarity and competition as mechanisms contributing to the

invasiveness of *S. horneri*. If invasion by *S. horneri* results from its ability to outcompete native algae, then we expected the biomass and taxonomic richness of native algae to increase in areas where we experimentally removed *S. horneri*. Alternatively, if the invasion success of *S. horneri* relies on its ability to occupy underutilized resources, then we expected to see little change in the native algal assemblage in response to *S. horneri* removal. We also performed a field experiment involving the major herbivores to examine their grazing preferences for *S. horneri* versus other algae. Using a combination of feeding assays and distributional surveys, we tested the hypothesis that herbivores facilitate *S. horneri* by preferentially consuming native algae.

2. Materials and Methods

2.1. Study System

Field experiments and surveys were conducted on rocky reefs on the leeward side of Santa Catalina Island, located 35 km offshore of Los Angeles, CA, USA. Study reefs consisted of bedrock, boulders and cobble distributed along a moderate slope that transitioned to sand at depths of about 30 m. The reefs were dominated by native macroalgae and the invasive *Sargassum horneri*. Native macroalgae included the canopy-forming giant kelp *Macrocystis pyrifera*, subcanopy-forming species of kelp (e.g., *Eisenia arborea* and *Agarum fimbriatum*) and fucoid algae (e.g., *Sargassum palmeri, Stephanocystis neglecta* and *Halidrys diocia*), and understory-forming foliose and calcified algae. Sessile invertebrates occupied only about 3% of the reef surface. *S. horneri* has become one of the most common macrophytes on shallow reefs at Santa Catalina Island since its introduction in 2006.

The primary grazers at Santa Catalina Island include sea urchins and herbivorous snails. *Centrostephanus coronatus*, the most abundant species of urchin, takes refuge in crevices and forages within <1 m from its shelter during the night before returning to the same location before sunrise [38]. This behavior leads to the formation of urchin "halos" where they commonly graze down algae within small home ranges.

2.2. Competition

To test the effects of *Sargassum horneri* on the abundance and taxonomic richness of native algae, we compared the native algal assemblages in experimental plots from which *S. horneri* was continually removed (hereafter referred to as S−) with those in unmanipulated control plots with *S. horneri* left intact (S+) over 3.5 years. We also measured the reduction in the amount of light permeating through its canopy as a potential mechanism of competition. This experiment was conducted at Isthmus Reef (33.4476° N, 118.4898° W) at 6 m depth, within the range where *S. horneri* is most abundant. Twenty-four 1 m^2 plots separated by a distance of at least 2 m were established on areas of reef comprised of >90% rock and with a high density (i.e., at least 30 individuals) of *S. horneri*. *S. horneri* was removed from 12 randomly assigned plots (S−) beginning in spring 2014 and every 6 to 12 weeks thereafter until summer 2017. S− plots had a 30 cm wide buffer zone around the perimeter where *S. horneri* was removed to minimize potential edge effects such as shading by individuals outside of the plot. Removal entailed divers using knives to pry all *S. horneri* holdfasts off the substrate, minimizing disturbance to the other biota within the plot as much as possible. Since competitive interactions may vary with time and among seasons, we sampled the algal communities in all S+ and S− plots just prior to the initial removal of *S. horneri* in spring 2014 and quarterly thereafter (i.e., summer, autumn, winter and spring) over three consecutive growing seasons (2014–2015, 2015–2016 and 2016–2017).

Algae were identified to the lowest taxonomic level possible, which in most cases was species (Table S1), and measurements of all understory and subcanopy-forming algae were taken in order to estimate the damp biomass of algae in each plot. The abundance of low-lying understory algae was measured as percent cover using a uniform point contact (UPC) method that involved recording the presence and identity of all algae intersecting 49 points distributed in a grid within each 1 m^2 plot. Percent cover was determined as the fraction of points a taxon intersected × 100. Although multiple

organisms may intersect a single point if they overlay one another, a taxon was only recorded once at a given point even if it intersected that point multiple times. Using this technique, the percent cover of all taxa combined in a plot can exceed 100%, but the percent cover of any individual species or morphological group cannot. This sampling resolution was sufficient to detect species covering at least 2% of the area in a quadrat. If a species was present in the plot but not recorded at one of the 49 points, then it was assigned a percent cover value of 0.5%. Since percent cover does not necessarily scale with biomass for larger subcanopy-forming algae, we recorded the density and the average size of these taxa. Damp biomass was estimated from density and size data of subcanopy algae and percent cover data of understory algae using taxon-specific relationships obtained from the literature [27,39–41] or developed specifically for this project (Table S2).

All but two species of algae recorded in the study plots were native to the region; the non-native *Sargassum muticum* and *Codium fragile* occurred in low abundance. Both of these species and *S. horneri* were excluded from analyses to test specifically for the effects of *S. horneri* on the native algal assemblages [42]. The surface canopy-forming giant kelp, *Macrocystis pyrifera*, was present at the beginning of the experiment, but it declined quickly during a warming trend and disappeared by December 2014 for the duration of the study. Consequently, its presence did not factor into our analyses.

The effects of *S. horneri* removal on the taxonomic richness and aggregate biomass of native algae were evaluated using linear mixed effects models [43]. Taxonomic richness was calculated as the number of unique native algal taxa within each plot, and aggregate biomass was calculated as the summed damp biomass of all native algae within each plot. Since we hypothesized that treatment effects may differ among seasons and develop over time, we included season, treatment (S+ or S−) and days since the start of the experiment (elapsed time) as main effects in the model. To account for variation associated with resampling individual plots, we included plot and the summed damp biomass of native algae within each plot at the start of the experiment prior to the first removal of *S. horneri* as random effects. Full models with the main effects in question (i.e., season, removal treatment, elapsed time and the interactions of time–removal treatment and season–removal treatment) were compared against null or full models without the effects in question using likelihood ratio tests with chi-square test statistics to select the best fit based on the Akaike Information Criterion (AIC). Model assumptions of normality and homoscedasticity were validated through visual inspection of the residuals, and biomass data were square-root transformed to meet model assumptions. To identify which time periods contributed to the time-by-removal treatment interaction, we used Tukey's Honest Significant Difference (HSD) post hoc analysis to compare the means of S+ and S− treatments for each sampling period.

Differences in the composition of the algal community between S+ and S− plots were tested using non-metric multi-dimensional scaling (nMDS) and analysis of similarities (ANOSIM). We compared the mean biomass of each taxon in S+ and S− plots in spring and summer 2017, during and after the sampling period when *S. horneri* removal had a significant effect. We used an unrestricted permutation of raw data (999 permutations) on Bray–Curtis similarity matrices with square-root transformation applied. A similarity percentage (SIMPER) analysis was used to determine the taxa that contributed most to dissimilarity between S+ and S− plots.

To determine the amount of shading caused by the *S. horneri* canopy we calculated the percent transmission of photosynthetically active radiation (PAR, 400–700 nm) during the spring sampling periods in S− and S+ plots. Light was measured using a handheld spherical quantum sensor (LI-COR Model LI-192) oriented vertically in the center of each plot 30 cm above the bottom. Ten readings of Photosynthetic Photon Flux Density (PPFD in μmol m^{-2} s^{-1}) were taken in each plot and averaged. Percent transmission was calculated from the average of 10 PPFD readings taken at the surface before and after the dive as:

$$\%\ \text{transmission PAR} = \left[1 - \frac{\text{PAR}_{scf} - \text{PAR}_{plot}}{\text{PAR}_{scf}}\right] \times 100$$

We assessed how percent transmission of PAR was affected by *S. horneri* canopy biomass in S+ plots during spring using linear regression. We also tested the hypothesis that the removal of *S. horneri* increases PAR reaching the bottom compared to unmanipulated plots during spring following the initial removal of *S. horneri* using a repeated-measures ANOVA with removal treatment as a fixed factor, and plot and year as random factors. We used one-tailed *t*-tests to determine how the years differed from each other with respect to light transmission because we had an a priori expectation that light would be lower in S+ plots than S− plots. Percent transmission light data were arcsin-transformed prior to analyses to meet the assumptions of ANOVA.

2.3. Complementarity

We examined seasonal patterns of biomass of *Sargassum horneri* and native algae in the experimental plots described above to test their degree of temporal complementarity. Comparisons of native algae and *S. horneri* in S+ plots were used to determine whether the seasonality in biomass differed between the two, while comparisons of native algae in S+ and S− plots were used to determine whether seasonal fluctuations in biomass of native algae occurred independent of *S. horneri* abundance.

We examined the degree of spatial complementarity between *S. horneri* and native algae by comparing their biomass across the depth range within which most species of brown algae at Santa Catalina Island occur (0–30 m). Scuba divers counted the number of recruit (defined as <5 cm tall) and adult (defined as >5 cm tall) *S. horneri* and native species of subcanopy-forming macroalgae within 1 m^2 quadrats placed every 5 m along transects at four sites that ran perpendicular to shore from the intertidal to 30 m depth or where the reef transitioned to sand, whichever came first. Density data were converted to units of damp biomass using the method described above (see 2.2 Competition). Since these algae grow only on hard bottom substrate, we visually estimated the percent cover of rock within each quadrat and standardized density estimates to m^{-2} hard bottom. We performed these surveys in April of 2016, the time of year when the biomass of *S. horneri* reaches its peak [27]. Although smaller native understory species may also compete with *S. horneri,* limits on bottom time prevented us from sampling them.

Measured depths were adjusted relative to the Mean Lower Low Water (MLLW) and quadrats were binned into depth intervals of 5 m. Between one and three quadrats were sampled within each depth interval at each site, depending on the grade of the reef. The aggregate biomass of native algae within a quadrat was calculated as the sum of the biomass of the juvenile and adult stages of all native species measured. A two-way ANOVA was used to test whether the biomass of *S. horneri* and the aggregate biomass of native algae varied by depth interval and taxa.

2.4. Herbivory

We performed grazing assays and surveys of benthic algae within and adjacent to urchin halos to assess whether the palatability of *S. horneri* differed from that of other algae. In September 2016, replicate arrays consisting of *Sargassum horneri*, its native and introduced congeners *S. palmeri* and *S. muticum* and the native kelps *Macrocystis pyrifera* and *Eisenia arborea* were deployed at Isthmus Reef for periods of 48 h. Arrays were either exposed to grazing by urchins and snails or placed inside cages nearby that were designed to exclude these grazers. Cages were constructed from 1 cm-gauge plastic mesh and were cylindrical in shape (1 m in height and 0.5 m in diameter) with mesh covering the top. Cages were open at the bottom and a 1 m-wide weighted skirt secured them to the reef and prevented grazers >1 cm from entering. All urchins and snails were removed from the cages at the beginning of each assay.

During each of the four deployments, 15 arrays containing one sample of each of the five target species of algae were placed in urchin halos while another 15 were placed inside cages. Urchin halos were defined as sections of the reef adjacent to a small ledge where >10 urchins were found and grazing activity was apparent from a lack of algae growing within a 30 cm radius. Some herbivorous snails were also present in the halos, including *Tegula eiseni*, *Tegula aureotincta*, *Megastrea undosa* and *Norrisia norrisii*. Cages were left in the same location for the duration of the experiment, but we selected

unique halos for each deployment so that herbivores would be naïve to the arrays. In the day preceding each deployment, we collected and weighed similarly sized blades or thalli of the five target species. Damp weights were quantified prior to deployment and immediately after collection by spin-drying samples for 10 s before weighing them. Three repeat measurements of each sample were taken by re-hydrating the sample and repeating the drying and weighing process. The average of three replicate measurements for each sample was used to optimize our ability to detect small changes in tissue loss.

Herbivore preference was assessed by comparing algal weights measured before and after each deployment in the exposed versus caged arrays. We calculated the percent of biomass lost as:

$$\% \Delta = \left[\frac{G_{final} - G_{initial}}{G_{initial}} \right] \times 100$$

where $G_{initial}$ and G_{final} represent the mean of the three replicate weights measured for each sample before and after deployment respectively. For each deployment, exposed and caged arrays were randomly paired and the biomass of each species of algae lost due to grazing was calculated as the difference in the change in biomass between paired arrays. One-way ANOVA was used to evaluate whether the biomass lost due to grazing differed by species, and post hoc contrasts were tested for significance with a Tukey HSD test to determine which species were preferentially consumed. Model assumptions of normality and homoscedasticity were validated through visual inspection of the residuals.

To provide a more time-integrated assessment of the feeding preferences of grazers, we tested whether the relative abundance of *S. horneri* differed from that of native algae in heavily grazed areas during the final deployment. We did this by measuring the percent cover of all subcanopy and understory algae in 1 m^2 quadrats placed adjacent to the 15 urchin halos and at 15 nearby reference locations with high algal cover. Percent cover was assessed using the uniform point contact sampling method described above (see 2.2 Competition). We standardized estimates of cover for individual algal taxa to the total cover of subcanopy and understory algae within each quadrat to compare the relative algal composition adjacent to and away from halos. We ignored encrusting algae and unoccupied space in order to focus on the differences between the foliose algal species that are likely to be consumed by the grazers. Algae were identified to the lowest taxonomic level possible, and were analyzed in the following groups: *S. horneri*, *S. palmeri* and other native algae (Table S3). We used a two-way ANOVA to test whether the cover of these taxonomic groups differed adjacent to and away from urchin halos, and Tukey HSD post hoc contrasts were used to determine how the taxonomic groups differed from one another. Standardized percent cover data were arcsin-transformed prior to analyses to meet the assumptions of ANOVA.

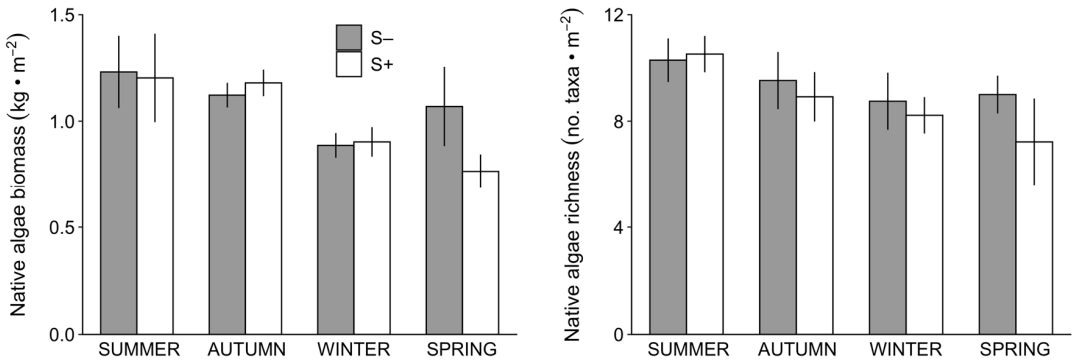
2.5. Software Used for Statistical Analysis

All univariate statistical models and tests were completed using RStudio (version 1.1.414) for R Statistical Computing Package [44]. Linear mixed models were fit using the lme4 package [45], and post hoc comparisons were performed using the multcomp library [46]. All multivariate analyses were conducted using PRIMER v7.0 [47] and PERMANOVA+ for PRIMER [48].

3. Results

3.1. Competition

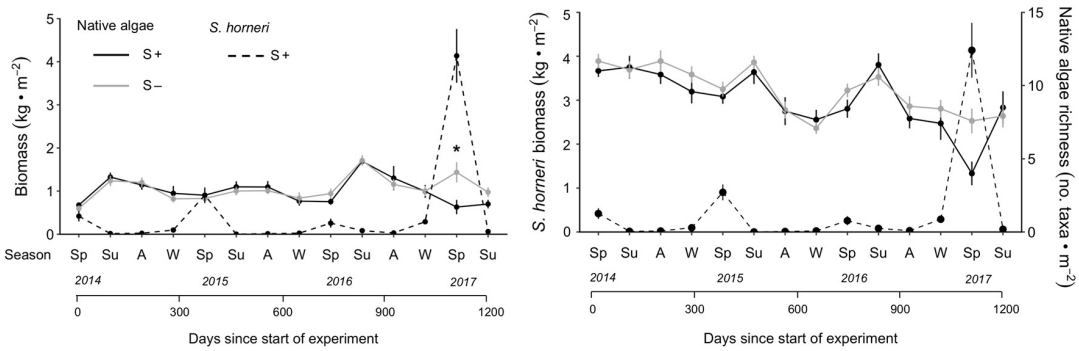
The aggregated biomass and taxonomic richness of native algae varied significantly by season (Table 1). Biomass peaked during summer and autumn, declined by winter and remained low into spring (Figure 1a), while richness also peaked in summer and declined slightly through spring (Figure 1b). The effects of experimentally removing *Sargassum horneri* on the biomass and species richness of native algae were dependent on season (see season × removal interactions in Table 1).



(**a**) (**b**)

Figure 1. Mean (± SE) biomass (**a**) and taxonomic richness (**b**) of all native algae measured in *Sargassum horneri*-removal (S−; grey bars) and non-removal (S+; white bars) plots. N = 4 years for summer, and 3 years for autumn, winter and spring.

Although there was a significant interaction between season and removal for both biomass and species richness, post hoc tests revealed no particular season as driving the difference ($p > 0.05$ for all comparisons). Closer examination of the data revealed that the effects of *S. horneri* removal varied dramatically with days since the start of the experiment (Figure 2) as post hoc testing showed a significant difference in algal biomass between treatments in spring 2017 only, approximately 1100 days since the start of the experiment (Tukey's HSD, $p = 0.002$ indicated by * in Figure 2a; all other periods $p > 0.05$). This difference was driven by a bloom in native algae in S− plots that coincided with a dramatic increase in the biomass of *S. horneri* in S+ plots (Figure 2a). The biomass of native algae in S− and S+ plots began to converge again by summer 2017 when *S. horneri* biomass declined. The taxonomic richness of native algae decreased over the course of the study (Figure 2b), independent of the removal of *S. horneri* (Table 1b).



(**a**) (**b**)

Figure 2. Mean (± SE) biomass (**a**) and taxonomic richness (**b**) of native algae in *Sargassum horneri* -removal (S−; grey solid line) and non-removal (S+; black solid line) plots, overlaid by biomass of *S. horneri* in non-removal plots (S+; dashed line). Asterisk indicates sampling period where multiple comparisons tests (Tukey's HSD, $p < 0.05$) indicated a significant difference between treatments. N = 12 plots per sampling period. First data points in each series are from the pre-removal census.

The percent of photosynthetically active radiation (PAR) reaching the bottom in spring was inversely related to the biomass of *S. horneri* in S+ plots when examined across all four years (Figure 3a; $R^2 = 0.33$, $F_{1,46} = 24.03$, $p < 0.001$). This reduction in light can be attributed to the development of the *S. horneri* canopy, as evidenced by the significant effect of *S. horneri* removal on PAR (Figure 3b; ANOVA, $F_{1,22} = 25.2$, $p < 0.0001$). Post hoc tests revealed that *S. horneri* removal significantly increased PAR in each year (2015: $t = 3.00$, df = 22, $p = 0.003$; 2016: $t = 1.78$, df = 22, $p < 0.04$; 2017: $t = 7.84$, df = 22, $p < 0.001$), especially in 2017 when the biomass of *S. horneri* in S+ plots was greatest.

Table 1. Results from likelihood ratio tests and model selection for determining the influence of experimental removal of *Sargassum horneri* on the (**a**) biomass and (**b**) taxonomic richness of native algae. Independent variables included were: Days since the start of the experiment (Days), *S. horneri* removal treatment (Removal), and season of the sampling period (Season). Individual variables were tested against the null model and interactions were tested against additive models with the same parameters. Models were ranked according to Akaike Information Criterion (AIC) selection with lower AIC values indicating a better fit of the data. Significance was based on chi-square test statistics. Statistically significant *p*-values are in bold text.

Variables	Model	df	AIC	χ^2	Chi df	p ($<\chi^2$)
a. Biomass of native algae [1]						
Individual parameters	Null	4	2140.4			
	Days	5	2139.9	2.52	1	0.112
	Removal	5	2141.9	0.51	1	0.473
	Season	7	2106.3	40.22	3	< **0.001**
Interactions	Days + Removal	6	2141.4			
	Days × Removal	7	2132.2	11.15	1	< **0.001**
	Season + Removal	8	2107.7			
	Season × Removal	11	2104.7	9.02	3	**0.029**
b. Richness of native algae						
Individual parameters	Null	4	1489.7			
	Days	5	1403.8	87.83	1	< **0.001**
	Removal	5	1491.6	0.04	1	0.842
	Season	7	1447.1	48.54	3	< **0.001**
Interactions	Days + Removal	6	1405.8			
	Days × Removal	7	1407.1	0.72	1	0.397
	Season + Removal	8	1449.1			
	Season × Removal	11	1446.6	8.54	3	**0.036**

[1] data square-root transformed.

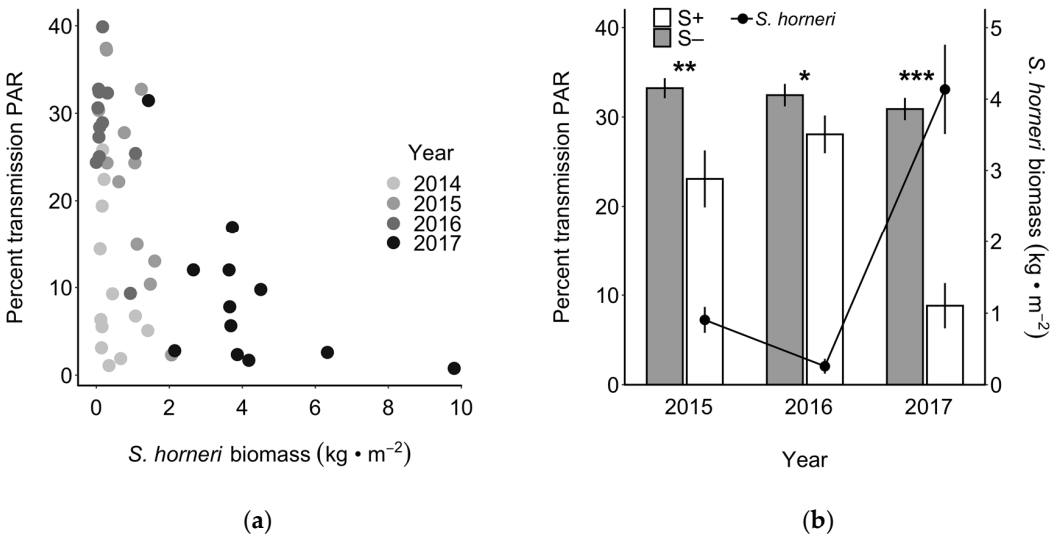


Figure 3. Percent transmission (i.e., percent of surface light reaching the bottom) of photosynthetically active radiation (PAR, 400–700 nm) related to *Sargassum horneri* biomass during spring. (**a**) Percent transmission of PAR related to *S. horneri* biomass in non-removal (S+) plots only, with each sampling year indicated by a different shade. (**b**) Effect of *S. horneri* removal on PAR. The left y-axis shows percent transmission of PAR (mean ± SE) in *S. horneri*-removal (S–; grey bars) and non-removal (S+; white bars) plots, and the right y-axis shows damp biomass of *S. horneri* (± SE) in non-removal (S+) plots when light measurements were taken. Asterisks indicate sample dates where *t*-tests indicated significant differences between treatments (*, **, ***: $p < 0.05$, 0.01, and 0.001, respectively).

Since *S. horneri* manipulation had no significant effect on the total biomass of native algae until spring 2017, we restricted our analysis of community structure in S+ and S− plots to data collected during spring and summer 2017. *S. horneri* removal significantly influenced the native algal assemblages in the spring (Figure 4a; PERMANOVA: Pseudo-$F_{1,21}$ = 2.90, p = 0.016) and summer (Figure 4b; Pseudo-$F_{1,22}$ = 2.12, p = 0.041). SIMPER analysis (Table 2) revealed that nearly fifty percent of the dissimilarity between S− and S+ treatments was explained by just two species in spring (*Sargassum palmeri* and *Zonaria farlowii*) and three species in summer (*Z. farlowii*, *S. palmeri* and *Colpomenia sinuosa*).

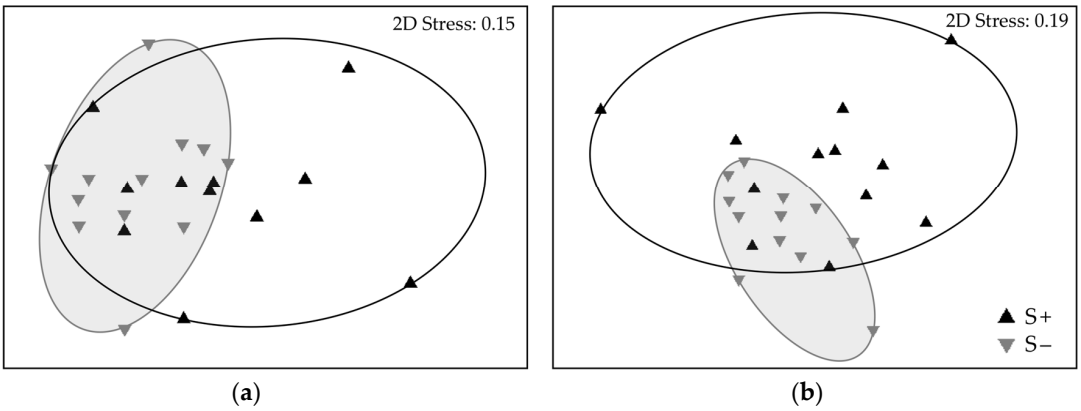


Figure 4. Non-metric multidimensional scaling (nMDS) plots showing benthic algal assemblage structure in plots where *Sargassum horneri* was removed (S−; grey) and in non-removal plots (S+; black) sampled in 2017. Data are presented by season as (**a**) spring and (**b**) summer. N = 24 plots. Analysis used damp biomass with a square root transform and Bray–Curtis similarity index. Two-dimensional (2D) stress values indicate the degree of mismatch between the predicted values from the regression of the similarity matrix and the distances between samples.

Table 2. Composition of the native algae present in spring and summer 2017 in unmanipulated (S+) plots and those where *Sargassum horneri* was removed (S−). Data are damp biomass (mean ± SE g·m^{-2}) and the percent contribution of individual taxa to the top 70% of the dissimilarity between S+ and S− treatments in SIMPER analysis.

Taxonomic Group	Taxon	Spring			Summer		
		S+	S−	%	S+	S−	%
Subcanopy algae	*Stephanocystis neglecta*	25.9 ± 15.3	27.2 ± 11.3	7.6	27.5 ± 10.3	19.0 ± 8.1	5.9
	Sargassum palmeri	415.1 ± 154.1	911.3 ± 232.5	29.0	172.3 ± 45.8	262.6 ± 67.6	14.3
Understory algae	Articulated coralline spp.	0 ± 0	1.6 ± 1.6	.	0.4 ± 0.4	1.6 ± 1.6	.
	Asparagopsis taxiformis	0 ± 0	0 ± 0	.	0.3 ± 0.3	1.1 ± 1.1	.
	Brown blade spp.	0 ± 0	6.0 ± 4.3	.	0 ± 0	0 ± 0	.
	Cladophora graminea	0 ± 0	0 ± 0	.	0.1 ± 0.1	0 ± 0	.
	Colpomenia sinuosa	0 ± 0	10.6 ± 8.4	.	148.3 ± 72.3	12.7 ± 5.4	12.3
	Chondria californica	0 ± 0	0.3 ± 0.3		1.1 ± 0.5	0.5 ± 0.4	
	Corallina chilensis	20.2 ± 10.6	30.5 ± 13.0	7.2	13.6 ± 7.4	12.3 ± 7.0	.
	Dictyopteris undulata	3.9 ± 2.2	23.5 ± 6.1	6.6	14.8 ± 6.7	45.9 ± 12.4	7.2
	Dictyota spp.	1.1 ± 0.7	20.4 ± 7.7	.	24.0 ± 11.2	24.0 ± 11.6	.
	Filamentous brown spp.	0 ± 0	0 ± 0	.	0.1 ± 0.1	0 ± 0	.
	Filamentous green spp.	0 ± 0	0.2 ± 0.2	.	0.2 ± 0.2	0.5 ± 0.3	.
	Filamentous red spp.	1.1 ± 1.1	1.2 ± 1.0	.	0 ± 0	2.4 ± 1.9	.
	Green foliose spp.	0 ± 0	0.5 ± 0.5	.	0 ± 0	0 ± 0	.
	Halicystis ovalis	0 ± 0	0 ± 0	.	0.2 ± 0.2	0.7 ± 0.4	.
	Haliptylon gracile	20.6 ± 11.5	20.4 ± 7.9	.	37.8 ± 21.3	28.7 ± 13.4	6.6
	Hydroclathrus clathratus	0 ± 0	0 ± 0	.	8.5 ± 4.2	5.3 ± 4.3	.
	Laurencia pacifica	0.6 ± 0.6	3.6 ± 1.1	.	7.7 ± 3.0	11.3 ± 5.2	.
	Lithothrix aspergillum	19.8 ± 10.0	21.0 ± 11.5	6.5	33.7 ± 20.9	25.1 ± 15.0	6.3
	Plocamium cartilagineum	2.7 ± 2.3	2.2 ± 1.5	.	17.3 ± 10.5	2.4 ± 1.4	.
	Pterocladia capillacea	4.6 ± 4.6	5.3 ± 4.3	.	8.5 ± 4.2	6.4 ± 4.3	.
	Rhodymenia californica	0 ± 0	1.9 ± 1.3	.	1 ± 0.5	0.6 ± 0.4	.
	Scytosiphon lomentaria	0 ± 0	0 ± 0	.	1 ± 0.7	0 ± 0	.
	Zonaria farlowii	171.9 ± 34.9	347.6 ± 72.2	16.2	182.7 ± 47.1	513.2 ± 84.7	17.7
Cumulative % contribution to dissimilarity		-	-	73.1	-	-	70.3

3.2. Complementarity

Sargassum horneri displayed a different seasonal pattern in biomass compared to the aggregated biomass of native algae. There was strong seasonality in the biomass of *S. horneri* in S+ plots, remaining low during summer and autumn, and increasing slightly in winter and dramatically in the spring (Figure 5). By contrast, the aggregated biomass of native algae fluctuated much less throughout the year with highest mean values recorded in summer and biomass declining through winter. In S+ plots, the biomass of native algae continued to decrease into spring, while in S− plots, an increase in the biomass of native algae occurred, which was driven primarily by the native congener *S. palmeri* in spring 2017.

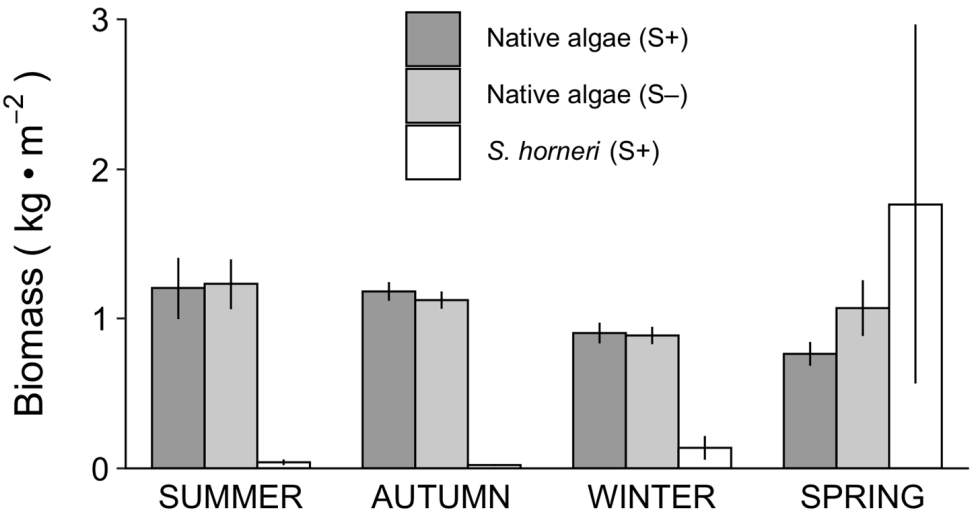


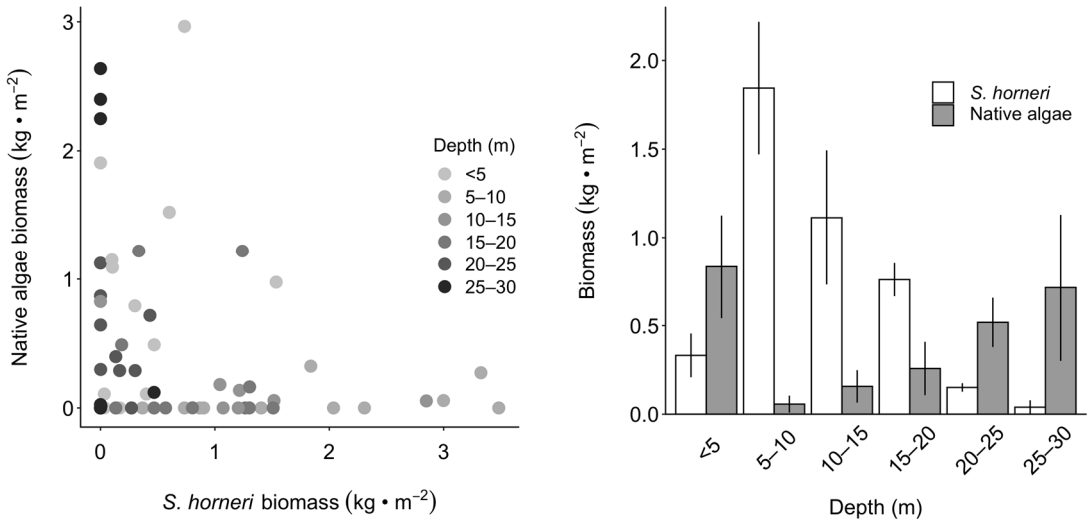
Figure 5. Seasonal mean (± SE) damp biomass of native algae (all species combined) and *Sargassum horneri* in *S. horneri*-removal (S−) and non-removal (S+) plots. N = 4 years for summer, and 3 years for autumn, winter and spring.

Results of the depth surveys were consistent with the hypothesis that spatial complementarity with native algae facilitates the invasiveness of *S. horneri.* Two-way ANOVA revealed that the effect of depth on biomass differed for *S. horneri* and native algae ($F_{5,1}$ = 11.78, p < 0.0001 for depth × taxa interaction), and the two were inversely related (Figure 6a). *S. horneri* was present from the intertidal to the deepest depths sampled, but was most abundant between depths of 5–20 m while the biomass of native algae showed peaks at <5 and >20 m (Figure 6b). The occurrence of specific taxa of native algae varied with depth (Table S4). Biomass of fucoid species (such as *Stephanocystis neglecta*, *Halidrys dioica* and *Sargassum palmeri*) as well as the native kelp *Eisenia arborea* peaked at shallow depths, while *E. arborea* also occurred at deeper depths in addition to another native kelp, *Agarum fimbriatum*.

3.3. Herbivory

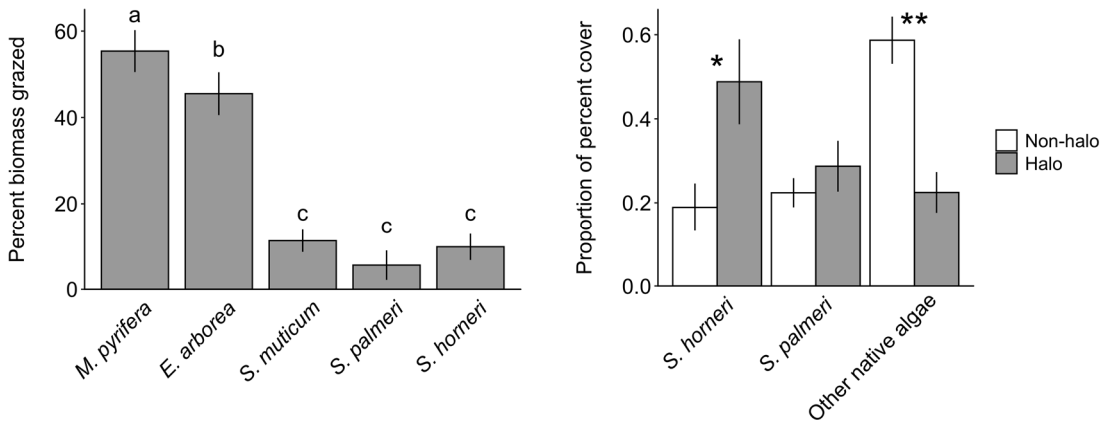
The effects of grazing on the biomass of algae remaining after 48 h assays differed significantly among the five species of algae tested (Figure 7a; ANOVA, F_4 = 35.146, p < 0.001). Approximately five times more biomass of *Macrocystis pyrifera* and four times more biomass of *Eisenia arborea* was lost due to grazing compared to the three species of *Sargassum*.

Surveys revealed that the taxonomic composition of algae varied between areas adjacent to and away from urchin halos (Figure 7b; Table S3). There was a significant interaction between taxonomic group and proximity on the relative percent cover (ANOVA, $F_{2,1}$ = 12.97, p < 0.0001). Post hoc tests revealed that the cover of *S. horneri* was approximately two times greater near the halos (p = 0.01). By contrast, the proximity to halos had no effect on the cover of *S. palmeri* (p = 0.98), while that of other native algae taxa near halos was about one third of the level away from halos (p = 0.001).



(**a**) (**b**)

Figure 6. Spatial co-occurrence of *Sargassum horneri* and native algae. Data are damp biomass of *S. horneri* and aggregated damp biomass of all native algae measured within 1 m^2 quadrats sampled along transects running perpendicular to shore. (**a**) Points represent individual quadrats, and are shaded by depth bin. N = 64 quadrats sampled across 4 sites. (**b**) Bars represent mean (± SE) biomass of *S. horneri* (white) and the native algae (grey) by 5 m depth bins. The mean and SE of individual species is provided in Table S4. N = 4 sites per depth bin except 25–30 m where N = 3 sites.



(**a**) (**b**)

Figure 7. Evidence for consumer avoidance of *Sargassum horneri*. (**a**) The difference in percent change in biomass (mean ± SE) in randomly paired samples of algae deployed in urchin halos and away from halos inside mesh cages over 48-h periods. Lower-case letters differentiate statistically significant differences between species (Tukey's HSD, $p < 0.05$). N = 57 paired arrays from four deployments. (**b**) Composition of algae adjacent to urchin halos (grey bars) and in nearby reference areas (white bars). Data are the mean proportion of the total percent cover of algae measured in 1 m^2 quadrats. N = 15 quadrats sampled per treatment. Asterisks indicate a significant difference between treatments (*, **: $p < 0.05$, 0.01, respectively).

4. Discussion

The ability of invasive plants to outcompete native flora for limited resources has been well documented [13,49,50] and is the primary mechanism that has been attributed to the successful invasion of *Sargassum muticum* in the coastal waters off Washington state, USA [30]. Its congener, *S. horneri*, has

a similar potential to displace native algae as a result of shading caused by the high canopy biomass it achieves during the spring [27]. However, we found little evidence that competitive superiority explains the high invasiveness of *S. horneri* in California as its sustained removal had a minimal effect on the biomass and composition of native algae over a 3.5-year period. Taxonomic richness of the native flora declined over the course of this study but was unresponsive to *S. horneri* removal. The total biomass of native algae was also unaffected by *S. horneri* manipulation until 2017, when it increased sharply in plots where *S. horneri* had been removed. The increase was driven primarily by a perennial congener, *S. palmeri.* This bloom of *S. palmeri* coincided with a large increase in the ambient biomass of *S. horneri* in spring 2017, which dramatically reduced the amount of light reaching the bottom in non-removal plots. Studies of aquatic plants and animals, marsh grasses and marine macroalgae have shown that impacts scale with the abundance of an invader (e.g., [51–54]). In this study, *S. horneri* had no detectable effects until it reached extremely high abundance, at which point only modest impacts to the native algal community occurred, driven primarily by a single closely related species.

The strength of competition between introduced and native species can vary spatially and temporally, depending on fluctuations in biomass driven by species' life histories or environmental factors [55]. The seasonal phenology of the macroalgal community suggested that *S. horneri*'s peak biomass was generally complementary to that of most of the native macroalgae, whose biomass tended to be highest in summer. This pattern was consistent regardless of the presence of *S. horneri* (i.e., in removal and non-removal plots) except during spring 2017 when *S. horneri* was extremely abundant, suggesting it was not a consequence of *S. horneri,* but rather a natural cycle. This conclusion is substantiated by similar estimates of seasonal biomass of native algae at Santa Catalina Island and elsewhere in southern California prior to invasion by *S. horneri* [39,56]. Since the giant kelp, *M. pyrifera*, was absent from our survey and experimental sites throughout nearly the entire course of this study, it did not factor into our analyses. However, like the other native algae we observed, the biomass of *M. pyrifera* in southern California often peaks in the summer and autumn and drops during winter and spring due to wave-induced disturbance to the canopy [57]. Hence, the success of *S. horneri* may be attributed in part to the decreased abundance of native algae during its period of peak growth and reproduction.

The depth distribution of *S. horneri* relative to that of native subcanopy algae could reflect the strength of their competitive interactions or physiological preferences for different parts of the environment. We found that *S. horneri* displayed spatial complementarity with other subcanopy algae as it was most abundant at intermediate depths (5–20 m), while native algae were most abundant at shallower (<5 m) and deeper (>20 m) depths. That the depth distributions of native subcanopy algae observed in our surveys were similar to those reported by others at Santa Catalina Island prior to the arrival of *S. horneri* [58–61] suggests that their lower abundance at intermediate depths was not due to competition with *S. horneri*.

The reasons for the peak in *S. horneri* abundance at intermediate depths in our study are unknown. However, the distribution of *S. horneri* in other regions indicates great versatility in light requirements, and opportunistic growth in situations where competition is minimal. For example, in its native range in Japan, *S. horneri* grows from the intertidal to 20 m [62] but is most common on shallow reefs from the low intertidal to 4 m [63]. In Baja California, Mexico, near the southern extent of its invaded range, *S. horneri* has been reported to occur from the intertidal [64,65] to at least 8 m depth [66]. Perhaps robust subcanopy-forming macroalgal communities at Santa Catalina Island deter *S. horneri* at very deep (>20 m) and very shallow (<5 m) depths, while increased space and light available at intermediate depths allow *S. horneri* to thrive with minimal competition. Such appears to be the case for the annual Asian kelp, *Undaria pinnatifida*, whose invasion success in the United Kingdom has been attributed in part to its broad depth range as well as its niche dissimilarities with native algae as the abundances of *U. pinnatifida* and native algae were inversely correlated along a depth gradient [67].

Our findings revealed that *S. horneri* has the greatest biomass at depths where, and times when, the abundance of native macroalgae is lowest. The consistent phenology of *S. horneri* in its native and invaded range [27] and of most native algae in the presence or absence of *S. horneri* suggest

that niche complementarity between them occurs throughout the year. Recent work by Sullaway and Edwards [68] at nearby sites at Santa Catalina Island supports this idea, showing that *S. horneri* increased rather than decreased levels of community production and respiration in this system. They concluded that *S. horneri* takes advantage of environmental conditions that disturb native algae and thrives as a consequence of disturbance, rather than causing an ecosystem shift due to its ability to outcompete the native flora [69]. Consistent with this idea is the observation by Caselle et al. [7] that *S. horneri* abundance at nearby Anacapa Island was significantly lower in older, well-established marine protected areas (MPAs) where the abundance of native algae was high relative to newly established MPAs. These authors argued that the differences in *S. horneri* abundance between new and old MPAs reflect stronger competition between native algae and *S. horneri* in the older MPAs where native algae flourish. Thus, niche complementarity may allow *S. horneri* to achieve high abundance only in places where competition from native algae is not strong.

Herbivores can influence the invasion success of freshwater and marine macrophytes directly through consumption of the invader, or they can mediate interspecific competition through preferential consumption of native species [23,36,37,70]. These preferences may arise from morphological differences or chemical defenses. For example, algae in the order Fucales (which includes the genus *Sargassum)* typically have high levels of phenolic compounds that are known to deter grazing [37]. Our results are consistent with this hypothesis, demonstrating that grazers consumed the native kelps *M. pyrifera* and *E. arborea* while avoiding *S. horneri* and its congeners *S. palmeri* and *S. muticum*. Our results also support the hypothesis posed by Caselle et al. [7] that urchins avoid *S. horneri* and preferentially consume native algae in areas where they co-occur, thereby reducing the potential for competition between them.

The composition of the benthic algal community reflected the grazer preferences we observed. *Centrostephanus centrotus*, the most abundant species of sea urchin in our study, is known to display strong feeding preferences, decreasing the abundance of favored species dramatically before switching to less-preferred species [38]. We found that native foliose algae were reduced and *S. horneri* was more dominant adjacent to urchin halos compared to nearby reference areas. Interestingly, we found no biomass response to grazing by its perennial congener *S. palmeri*, which is native to southern California. Thus while grazers avoided both species of *Sargassum* in favor of native foliose algae, only *S. horneri* responded to a lack of herbivory with increased abundance. It may be that *S. horneri* is able to colonize space created on the reef more readily than *S. palmeri* due to its annual life history and high fecundity. Traits related to rapid growth and high fecundity, as well as deterrence to herbivory, are often associated with invasive plants [71]. However, defenses often come at a fitness cost [72] and shorter lived, r-selected plants are not typically heavily defended [73]. Yet *S. horneri* is a species with r-selected traits that allow it to rapidly colonize available space, and it is also a member of an order of algae that typically displays high levels of chemical defense. These traits undoubtedly contribute to the ability of *S. horneri* to proliferate in places where interactions with native species are weak.

5. Conclusions

We found that the high propensity of *S. horneri* to invade southern California reefs results largely from its ability to occupy resources underutilized by native species in space and time and to resist grazing relative to native algae. Its annual life history, high fecundity and capacity for widespread dispersal further enhance its ability to colonize novel habitats. The complementary phenology of *S. horneri* and native algae suggest competition between them is generally weak, which is consistent with the results of our 3.5-year manipulative experiment. Our findings indicate the greatest potential for competitive interactions between *S. horneri* and native algae is at intermediate depths during spring when *S. horneri* peaks in biomass. Future work testing the effects of *S. horneri* on native algae should focus on this depth range and season. Collectively, our results highlight the importance of considering exotic marine species in the context of the invasibility of native assemblages when assessing their invasiveness and developing management strategies for controlling their spread.

Supplementary Materials: The following are available online at http://www.mdpi.com/1424-2818/12/2/54/s1, Table S1: List of native subcanopy and understory algal taxa recorded in the *Sargassum horneri* removal experiment, Table S2: Coefficients (a = intercept, b = slope), r^2, and *p* values or SE for formulas to convert size-specific density, or percent cover to damp biomass (g), Table S3: Proportional percent cover of algae adjacent to and away from sea urchin halos, Table S4: Depth distribution of *Sargassum horneri* and native subcanopy algae. The data presented in this manuscript are available online for download from the Long Term Ecological Research Network Data Portal, doi:10.6073/pasta/2c2237bb3cee86e7c6d9488e8ce2795d [74].

Author Contributions: Conceptualization, D.C.R., L.M.M. and S.J.H.; methodology, D.C.R., L.M.M. and S.J.H.; software, L.M.M.; validation, L.M.M.; formal analysis, L.M.M.; investigation, D.C.R. and L.M.M. resources, D.C.R.; data curation, L.M.M.; writing—original draft preparation, L.M.M.; writing—review and editing, D.C.R., L.M.M. and S.J.H.; visualization, L.M.M.; supervision, D.C.R. and S.J.H.; project administration, L.M.M.; funding acquisition, D.C.R., L.M.M. and S.J.H. All authors have read and agreed to the published version of the manuscript.

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Region Nine Kelp Consortium Annual Meeting August 18, 2020

Size of Kelp Beds in 2019 Orange & San Diego Counties

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OUTLINE OF PRESENTATION

1. Background Information
2. Survey Methods
3. Region Nine Survey Results
   - Status in 2018
   - Regional Overview for 2019
   - Descriptions of Individual Beds
4. Factors Affecting Kelp Beds
5. Conclusions
6. Preview of 2020

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BACKGROUND INFORMATION

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Region Nine Kelp Surveys

- Annual surveys each year >50 years (1967 to 2019)
- Methods developed by Dr. Wheeler North, Caltech (Pasadena)
- Region Nine Kelp Survey Consortium formed in 1982 (San Diego RWQCB and several ocean dischargers)
- Program funded by NPDES permit requirements for major dischargers

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Central Region Kelp Surveys

- Sporadic surveys >50 years (five from 1967 to 1998, annually 1999 to 2019, except 2001)
- Central Region Kelp Survey Consortium formed in 2003 (Los Angeles RWQCB and several ocean dischargers)
- Used Region Nine model - program funded by NPDES permit requirements for major dischargers

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SoCal Kelp Consortia Web Site

- https://www.mbcaquatic.com/service/socal-kelp-consortium

- Annual reports: 2010 to 2018
- List of consortium members for Region Nine and Central Region
- Meeting information
- Status of kelp in 2018

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SURVEY METHODS

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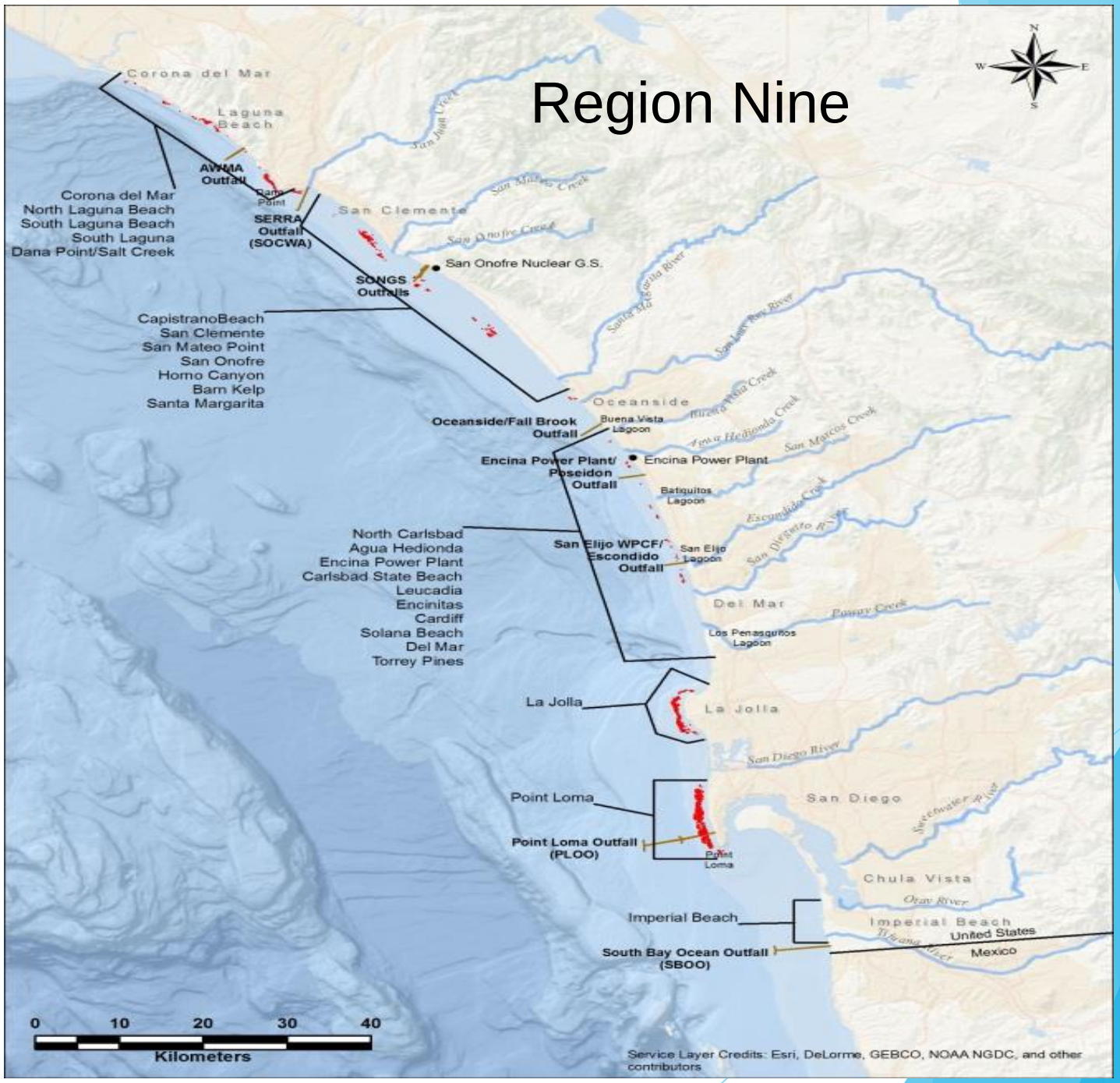
Region Nine



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Kelp Overflights

- Ecoscan (Santa Cruz)
- Cessna 182
- 30-mm lens
- Color IR film

@200 photos per survey

- 10-14,000 feet
- Wind <10 knots
- Swell <1.5 m
- Tides <1 foot range
- Sun angle >30°

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2019 Kelp Overflights

Survey	Date
1st Quarter	March 31, 2019
2nd Quarter	July 19, 2019
3rd Quarter	September 19, 2019
4th Quarter	December 19, 2019

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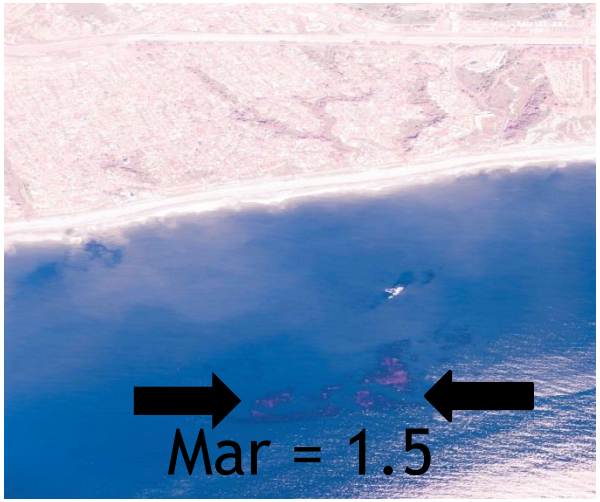
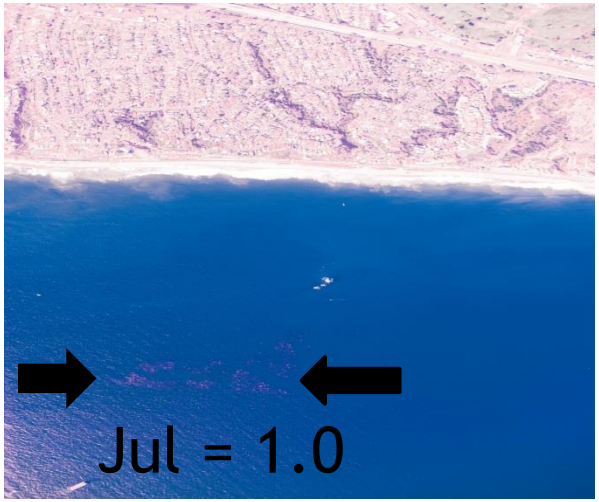
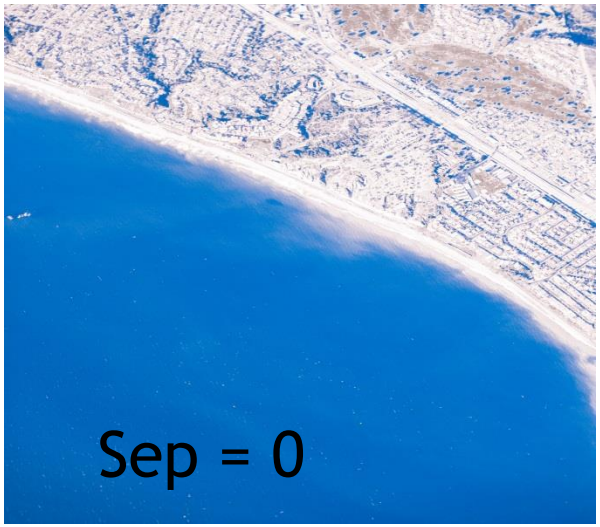
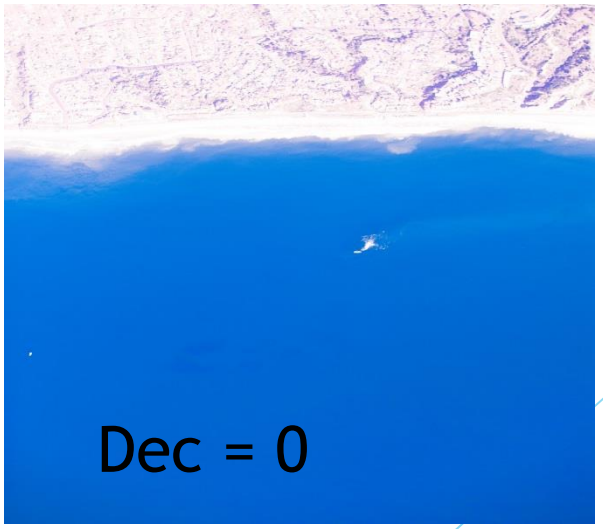
Maximum Canopy Area
San Clemente









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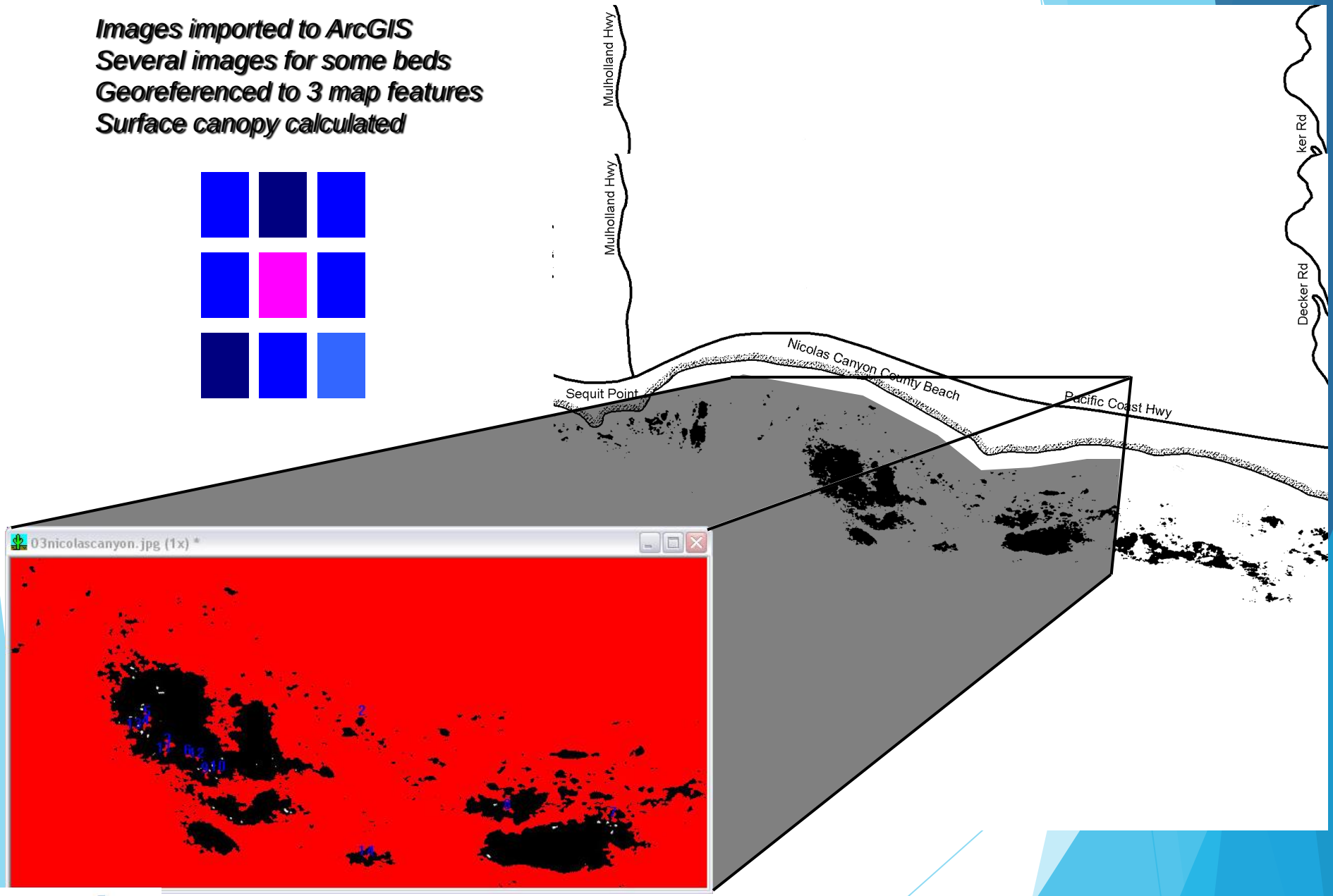
Images imported to ArcGIS
Several images for some beds
Georeferenced to 3 map features
Surface canopy calculated



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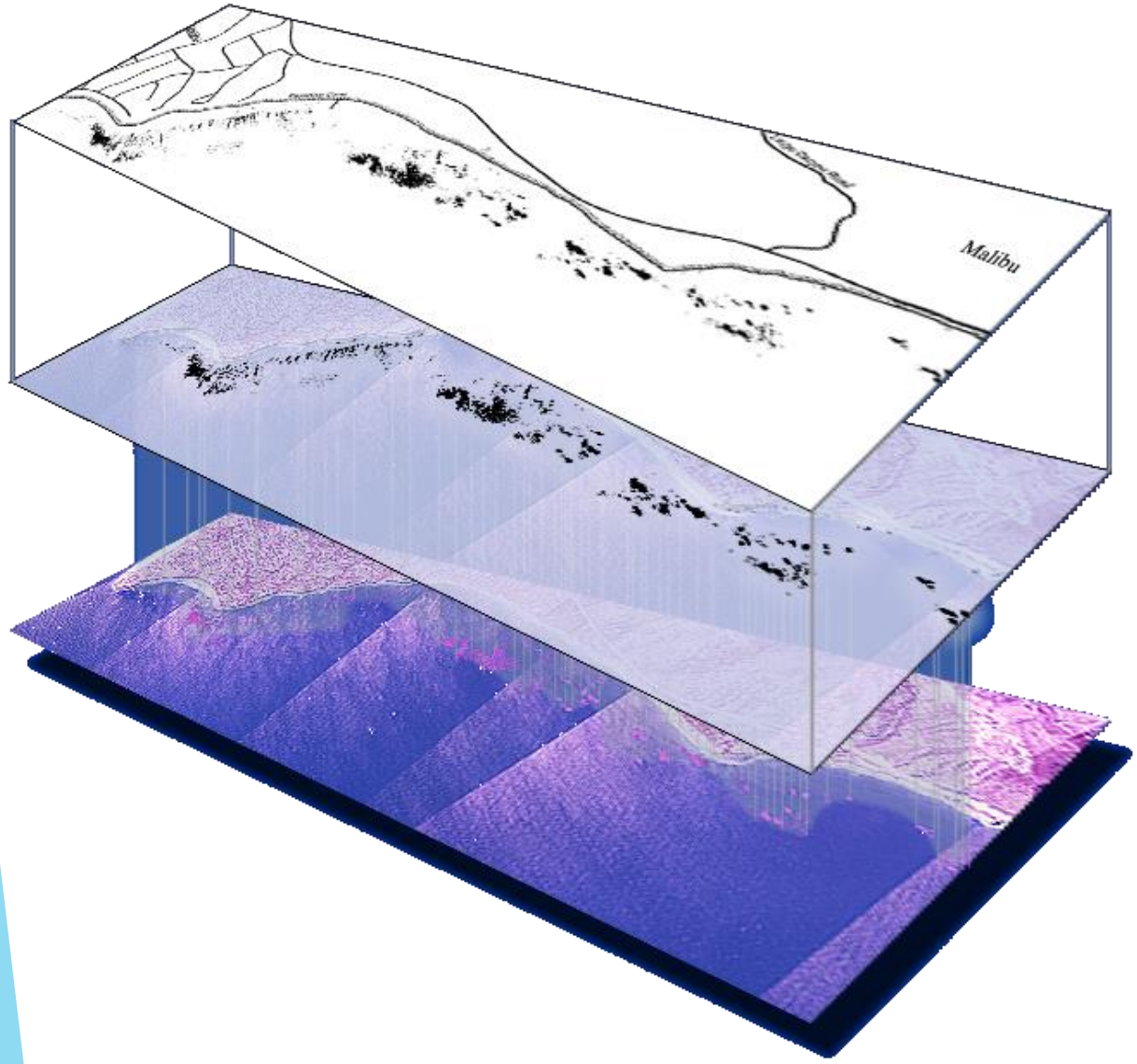

Photomosaics

Kelp extracted

Layered to basemaps

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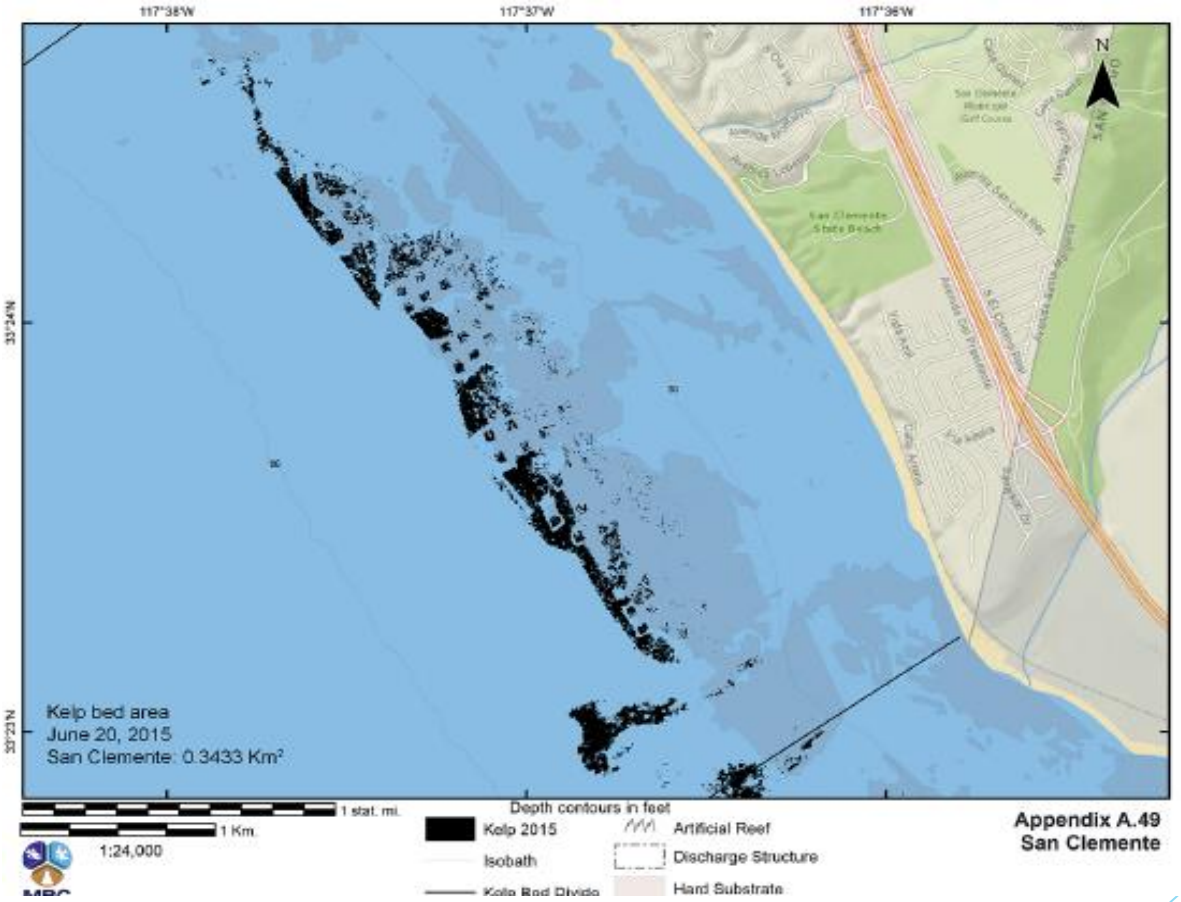
Standardized Basemaps of the Coastline



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Region 9 Vessel Survey

- January 4, 15 & 30, 2020

- Surface observations
  - Approximate extent of surface canopy
  - Tissue color, age of fronds, encrustrations
  - Subsurface kelp

- In-water diver surveys
- Dana Point/Salt Creek, Encina Power Plant, Leucadia north kelp beds
  - Marine life (e.g., urchins, fish)
  - Age and color of fronds
  - Presence and extent of subsurface giant kelp and other algae

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REGION NINE SURVEY RESULTS

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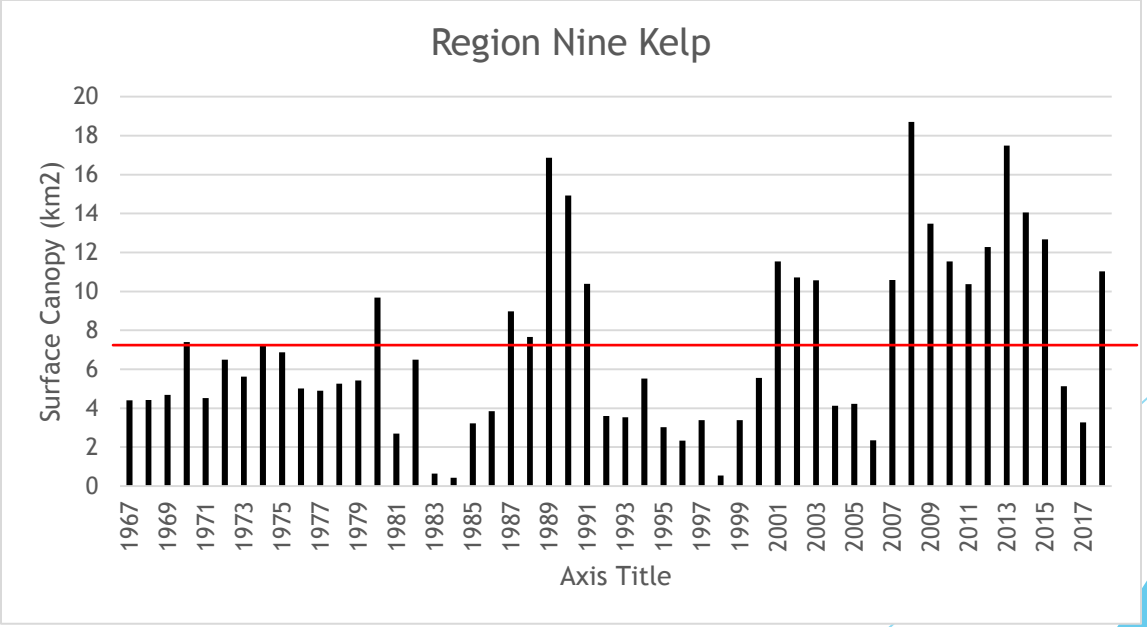
Region Nine 2018 Overview

- Total canopy coverage increased substantially
  - 15 beds increased in size
  - 4 beds decreased in size
  - 1 bed disappeared (Carlsbad State Beach)

11.0 km^2

+237%

3.3 km^2



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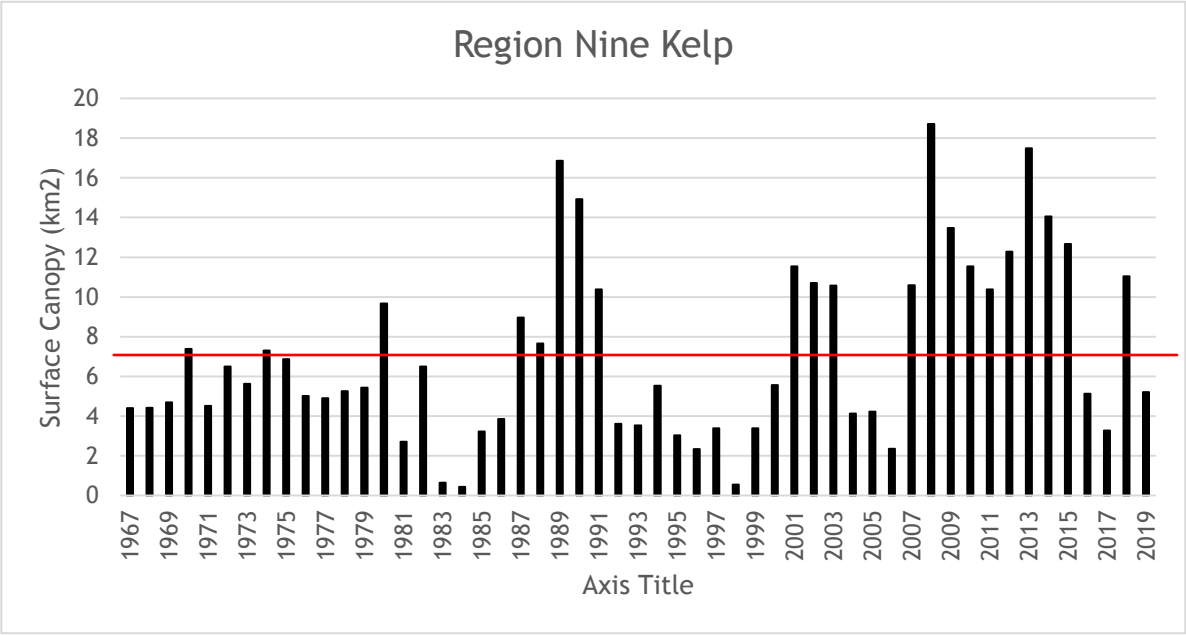
Region Nine 2019 Overview

- Total canopy coverage decreased substantially
  - 18 beds decreased in size
  - 10 beds disappeared

11.0 km^2

-53%

5.2 km^2



	2019 Quarterly Overflights			
Kelp Beds	March 31	July 19	September 19	December 19
North Laguna Beach	0.5	0.5	–	0.5
South Laguna Beach	0.5	0.5	–	0.5
South Laguna	–	–	–	–
Salt Creek-Dana Point	–	–	–	–
Dana Marina *	–	–	–	–
Capistrano Beach	–	–	–	–
San Clemente	1.5	1.0	–	–
San Mateo Point	0.5	–	–	–
San Onofre	0.5	0.5	–	–
Pendleton Reefs *	–	–	–	–
Horno Canyon	–	–	–	–
Barn Kelp	–	–	–	–
Santa Margarita	–	–	–	–
Oceanside Harbor *	–	–	–	–
North Carlsbad	–	–	–	–
Agua Hedionda	–	–	–	–
Encina Power Plant	–	–	–	–
Carlsbad State Beach	–	–	–	–
North Leucadia	–	0.5	–	–
Central Leucadia	–	–	–	–
South Leucadia	–	–	–	–
Encinitas	–	–	–	–
Cardiff	–	–	–	–
Solana Beach	–	–	–	–
Del Mar	–	–	–	–
Torrey Pines Park	–	–	–	–
La Jolla Upper	0.5	1.5	1.0	1.0
La Jolla Lower	2.5	3.0	1.0	2.5
Point Loma Upper	3.0	4.0	1.5	3.5
Point Loma Lower	3.0	4.0	1.5	2.5
Imperial Beach	–	–	–	–

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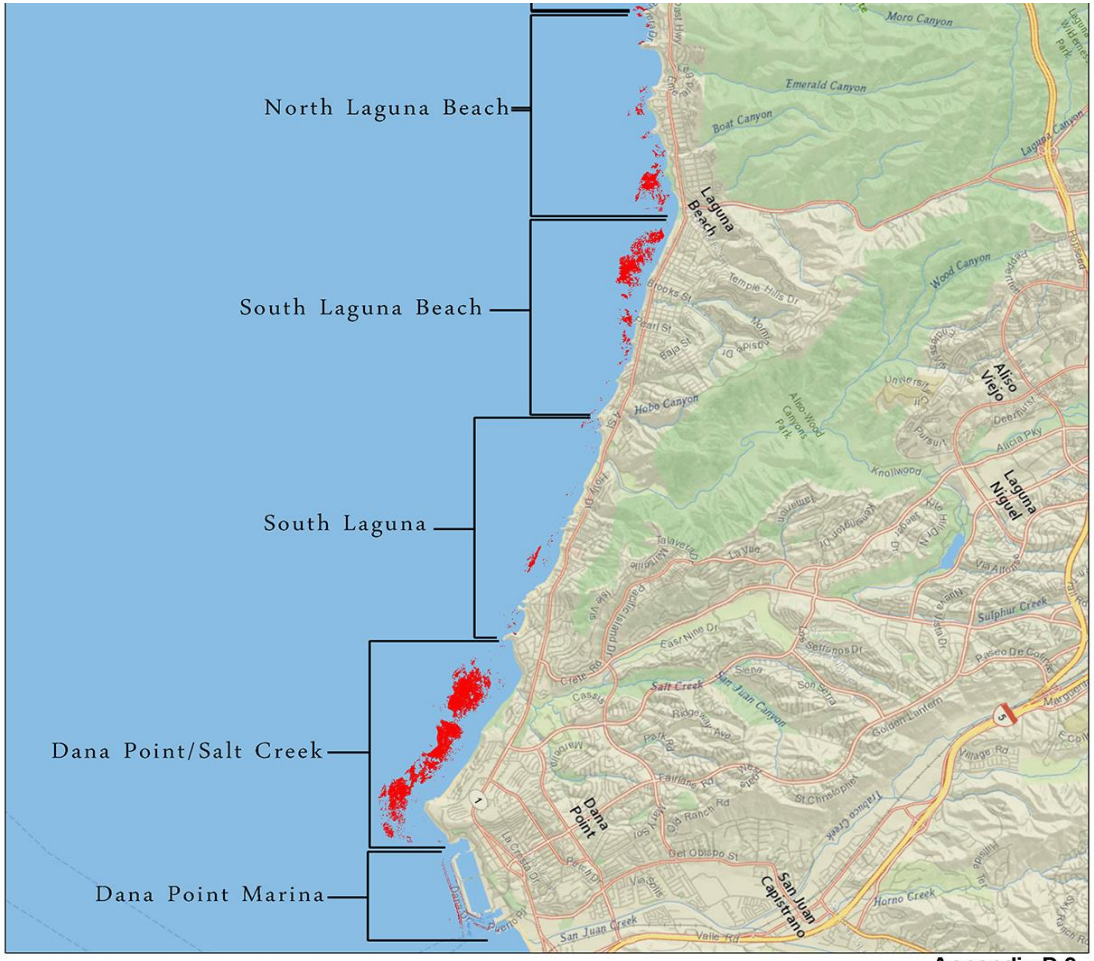
Orange County



Appendix D.9

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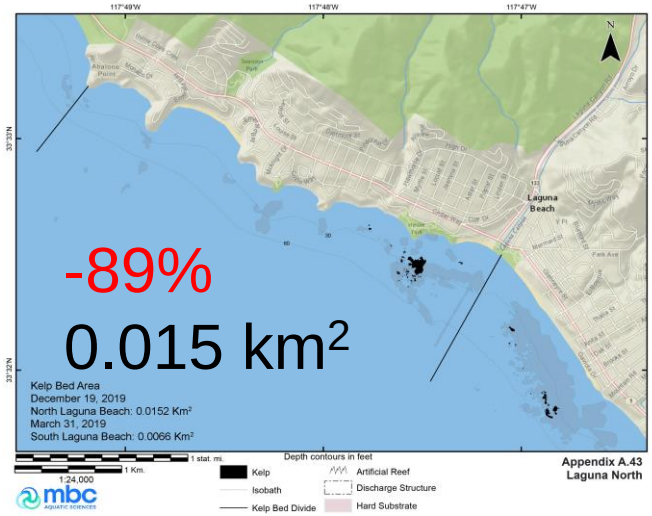
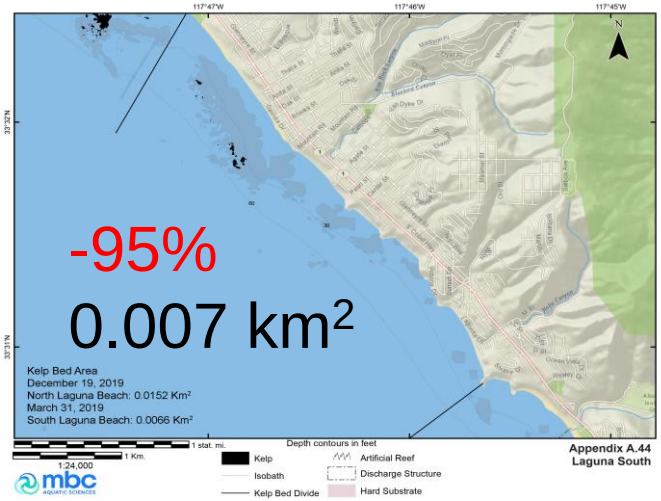
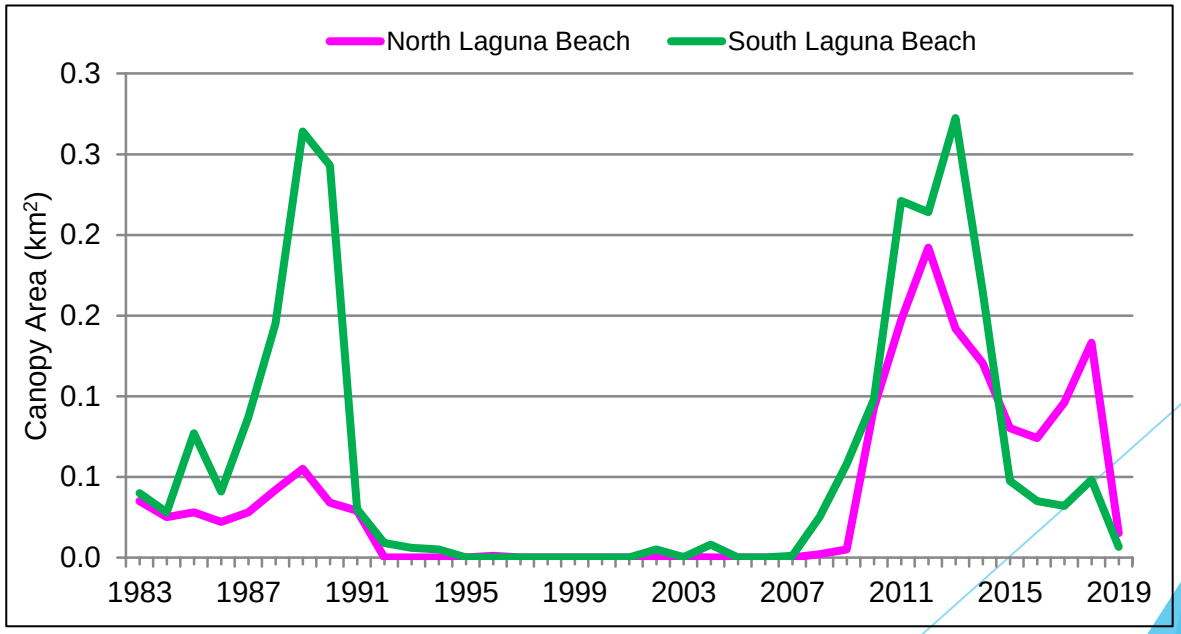
North Laguna Beach

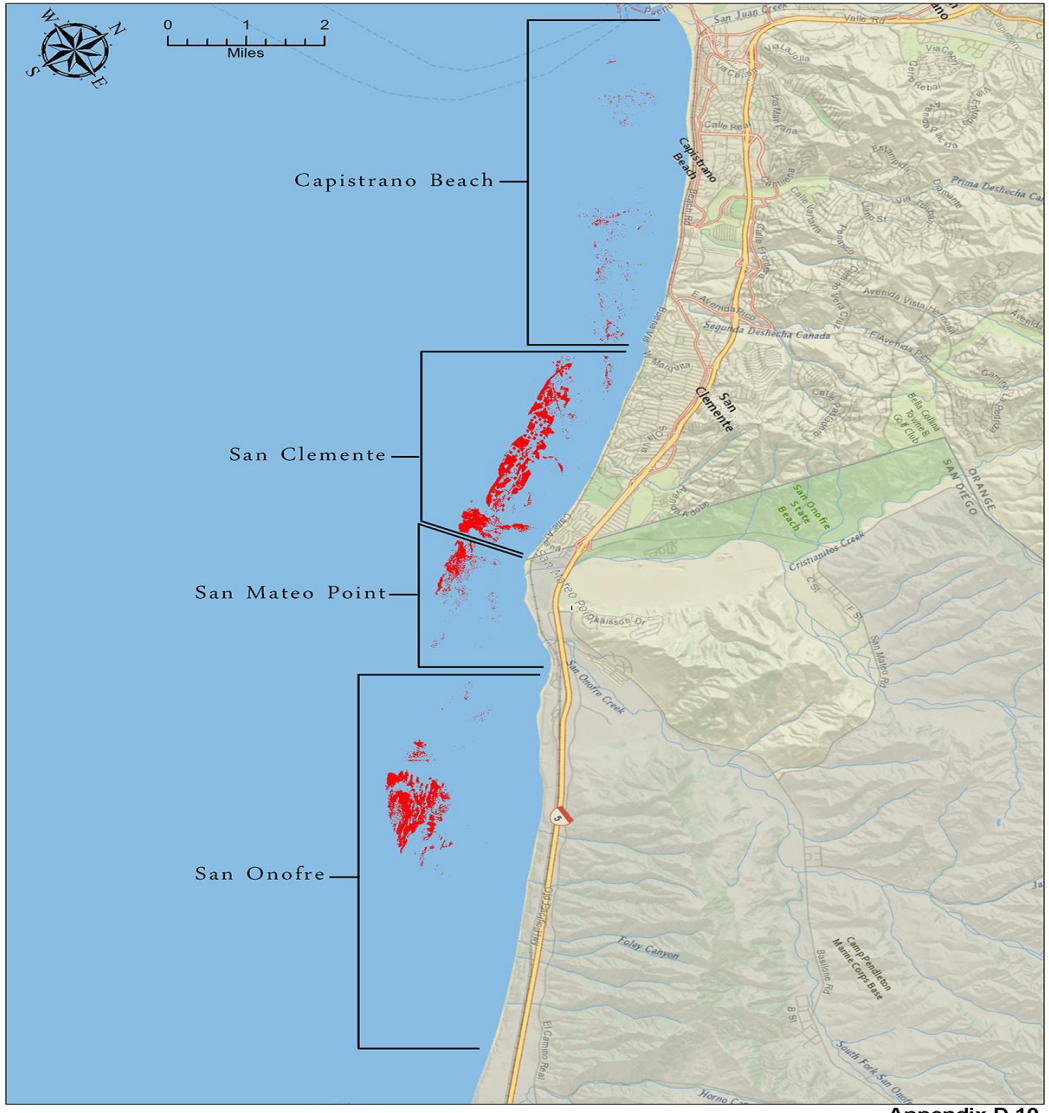


South Laguna Beach





Capistrano Beach to San Onofre



Appendix D.10

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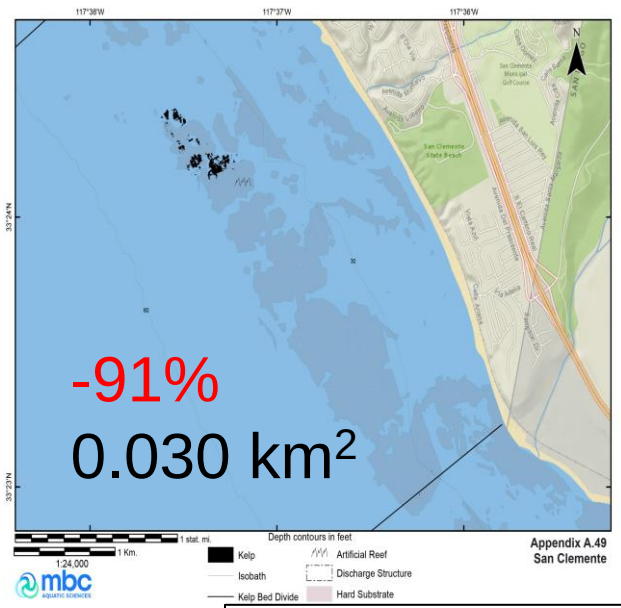
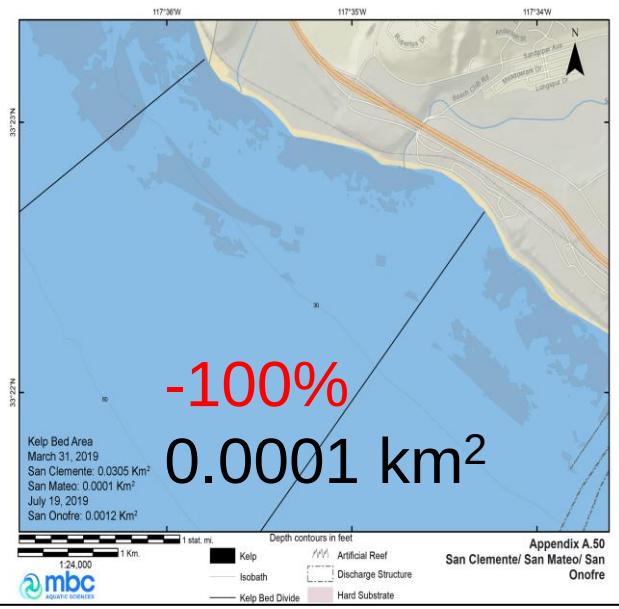
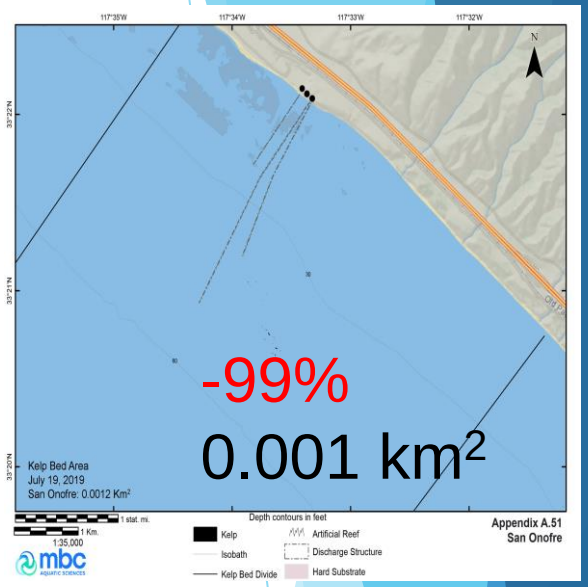
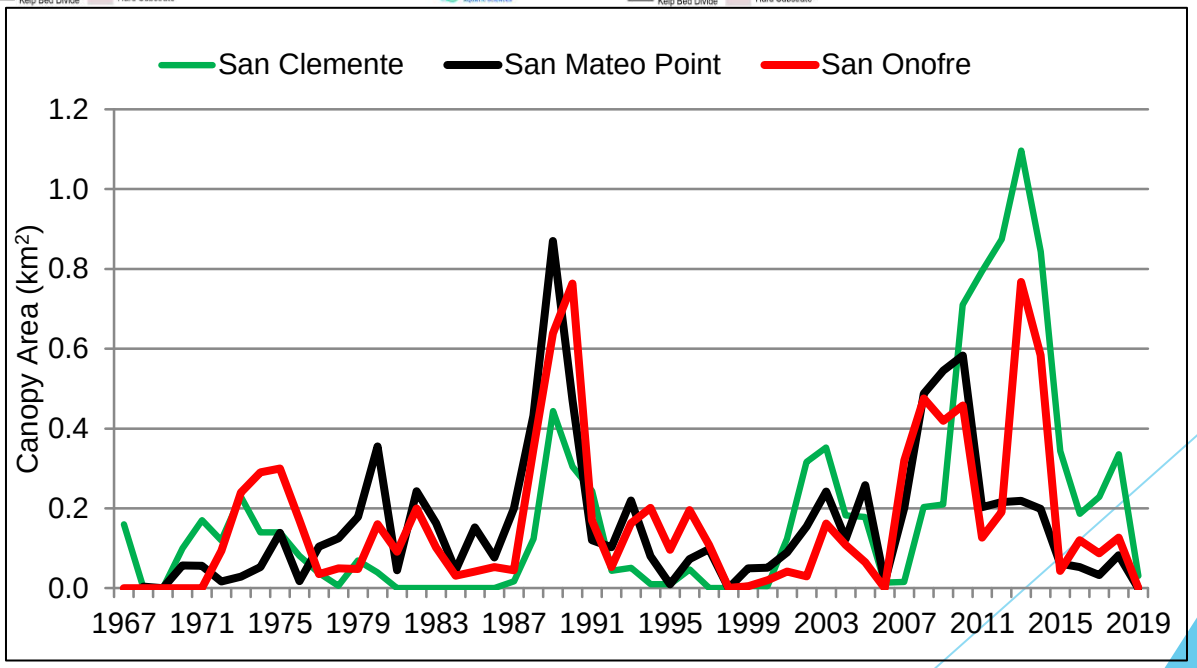
San Clemente San Mateo Pt San Onofre

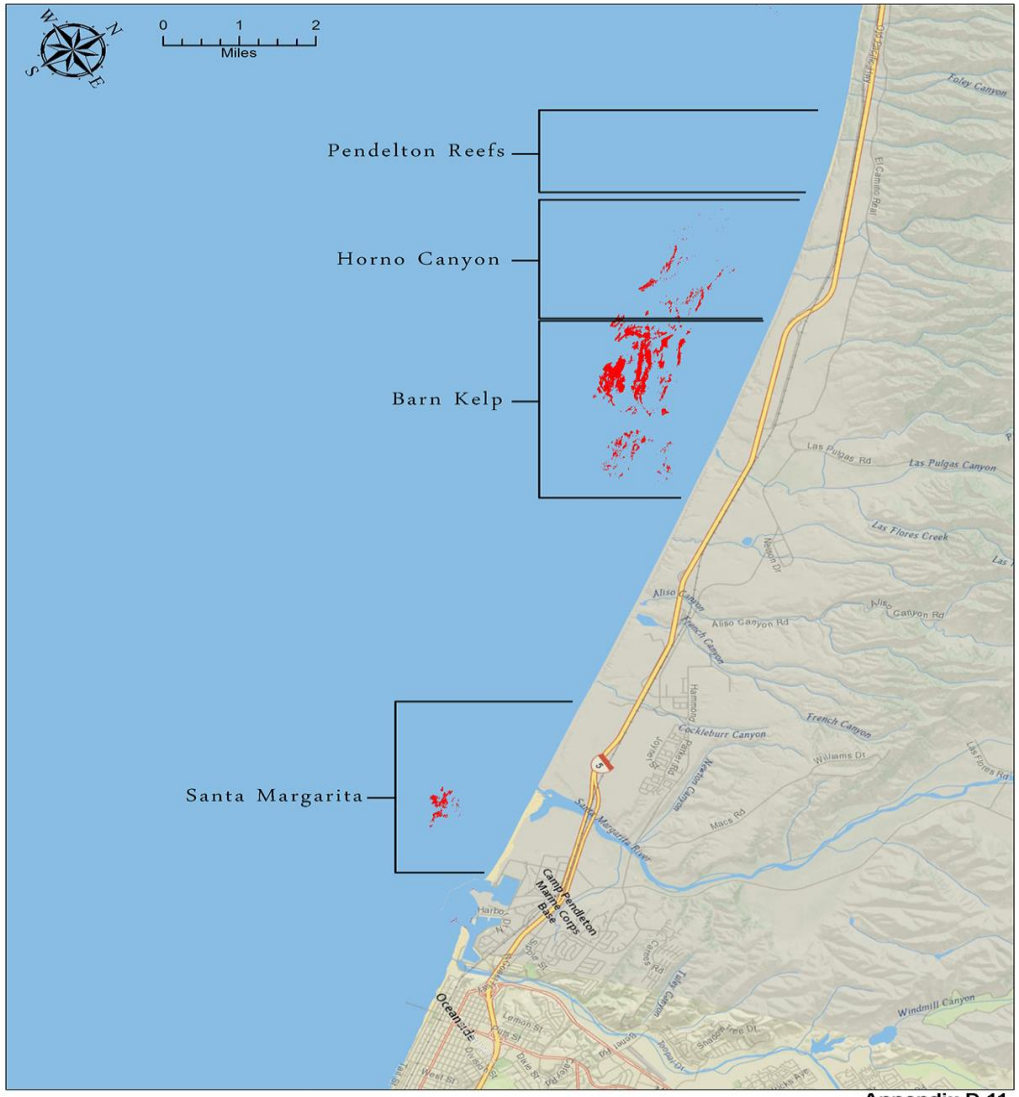








Horno Canyon to Santa Margarita



Appendix D.11

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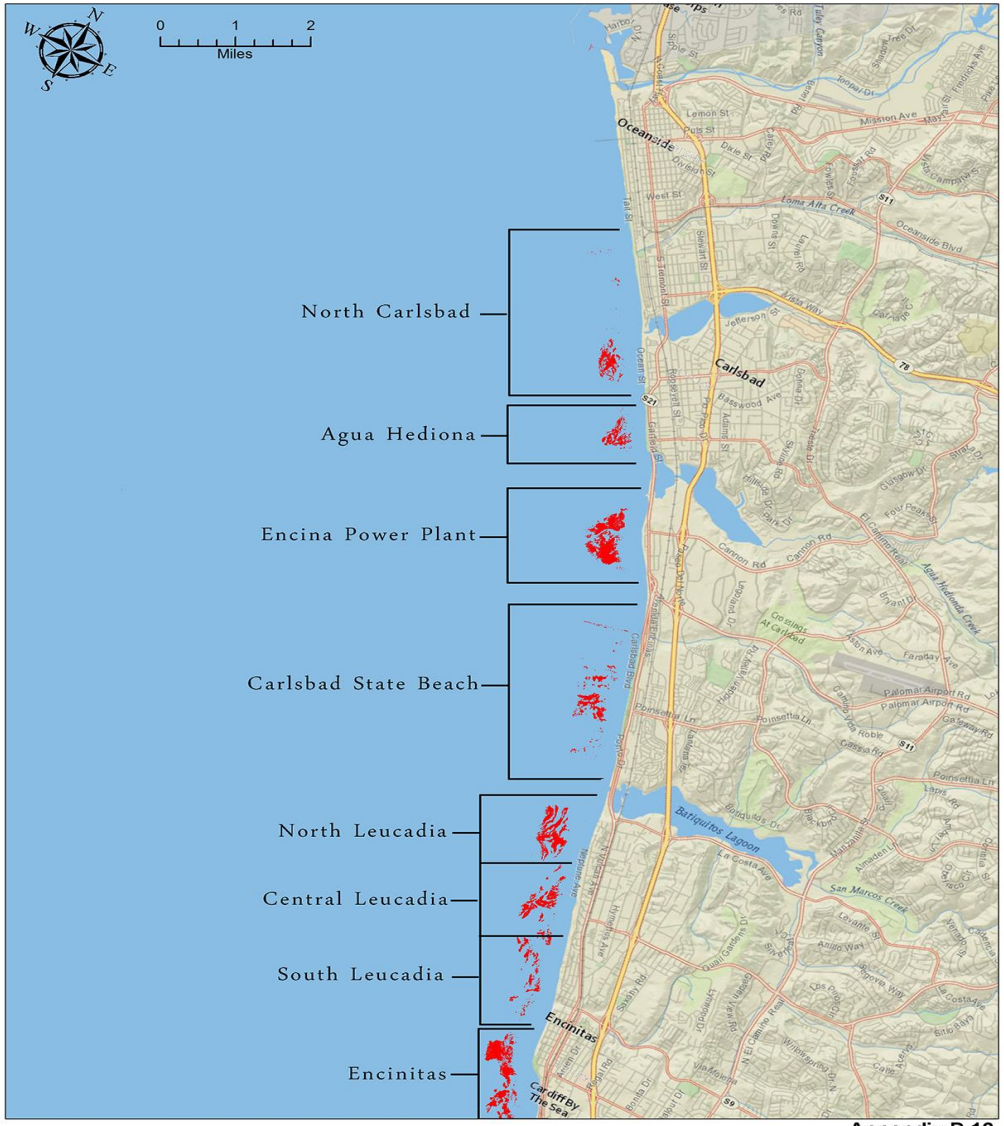
North Carlsbad to Encinitas



Appendix D.12

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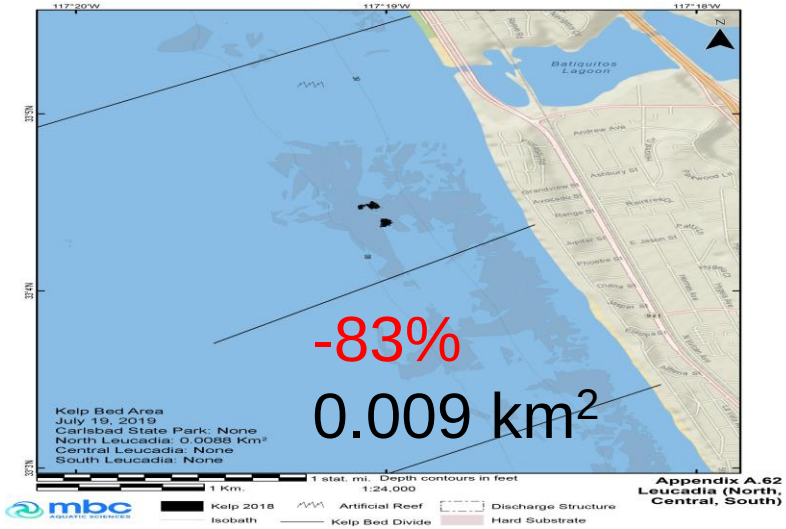
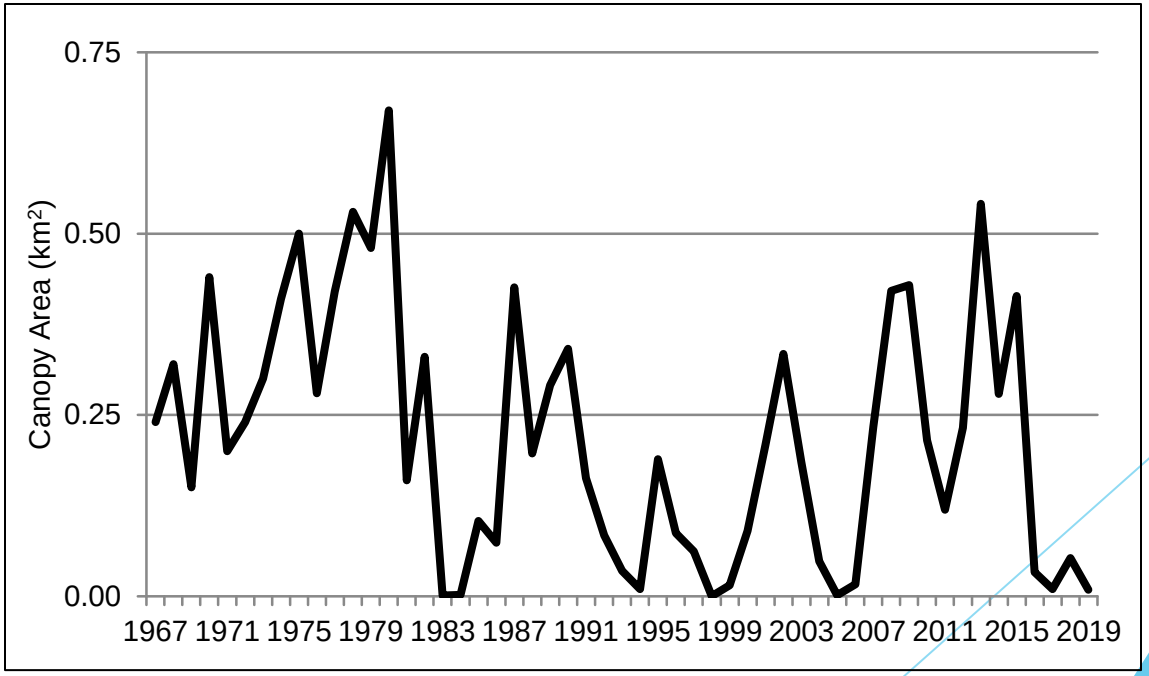
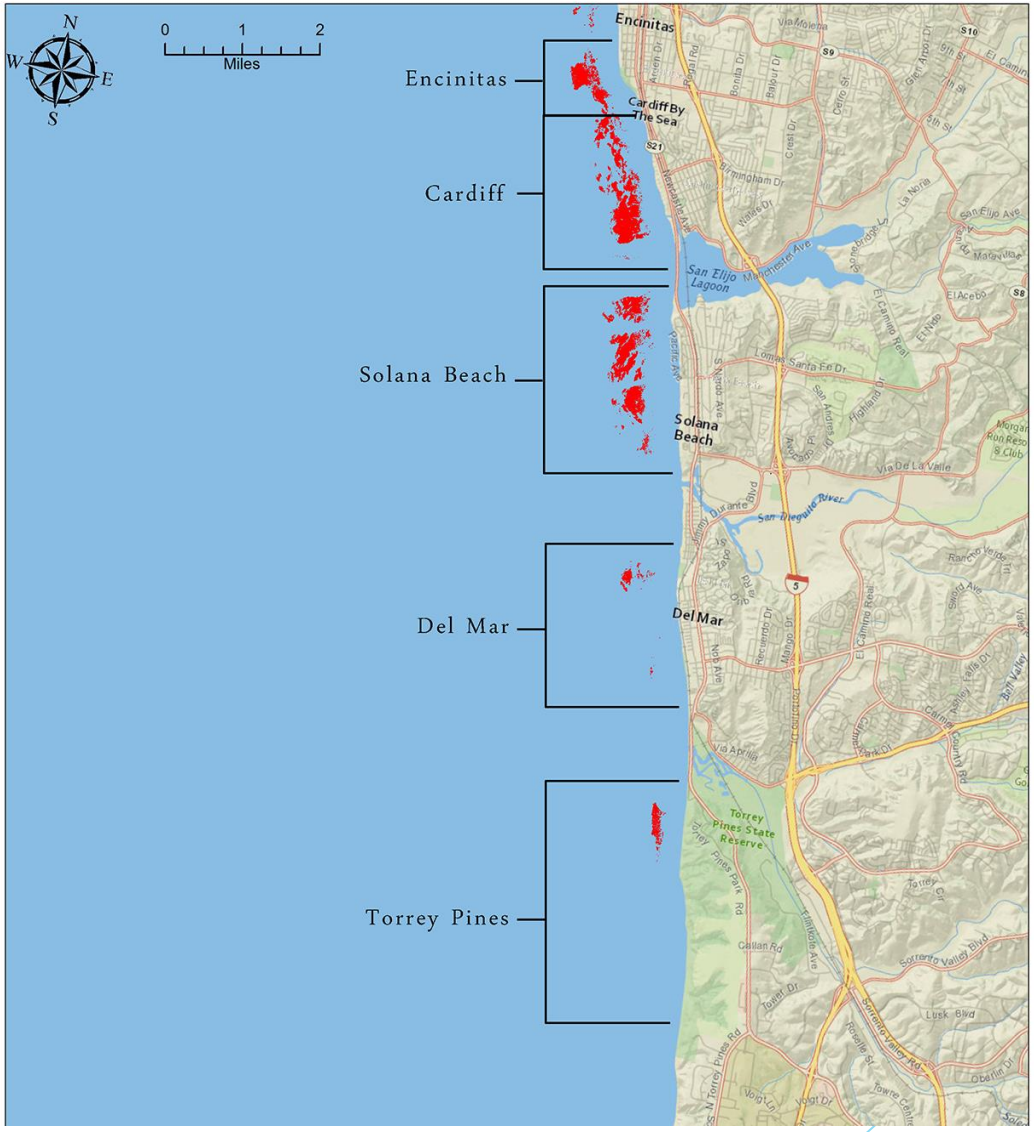
Leucadia - North





Cardiff to Torrey Pines



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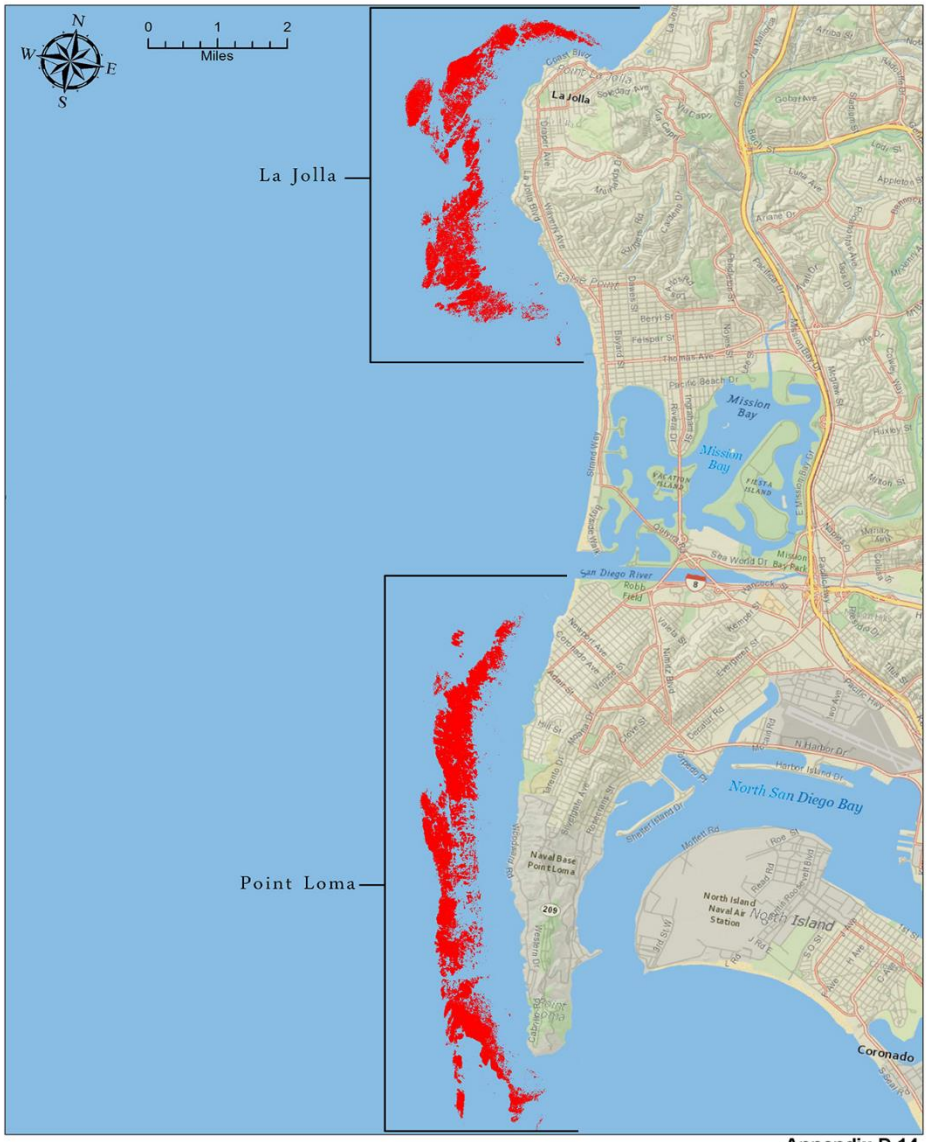
La Jolla and Point Loma



Appendix D.14

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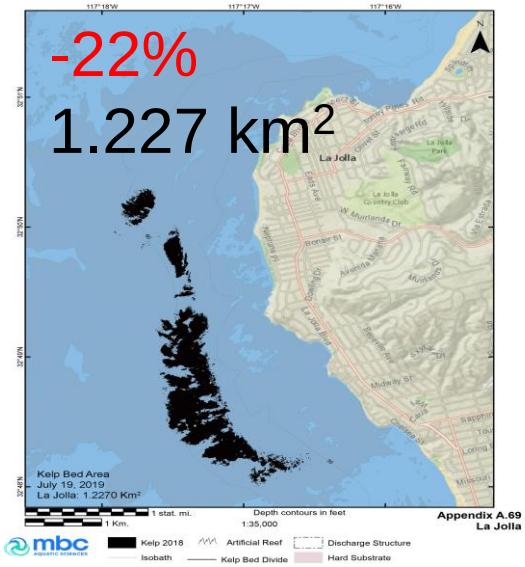
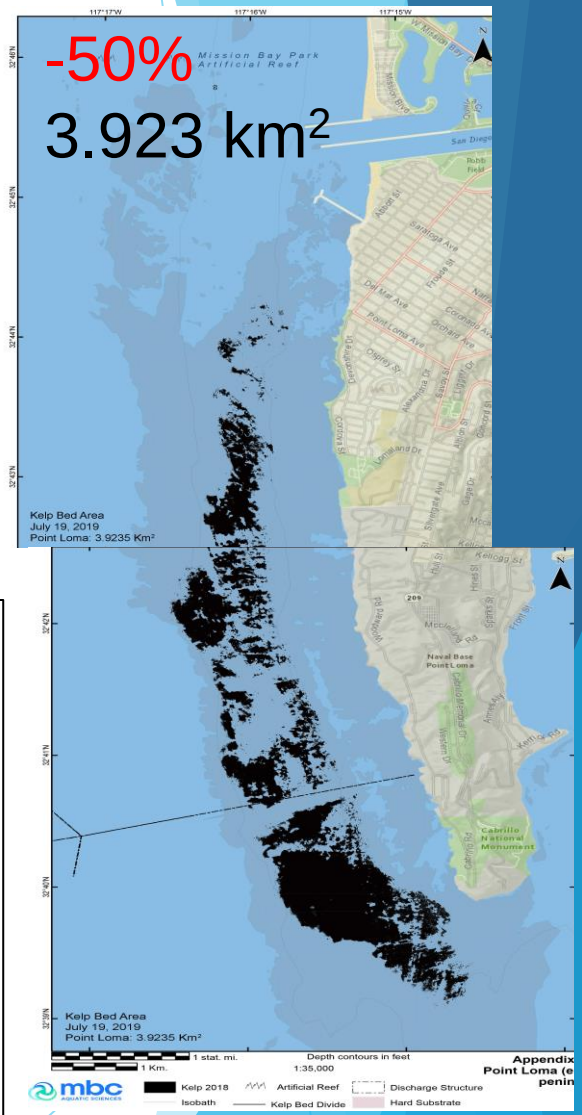
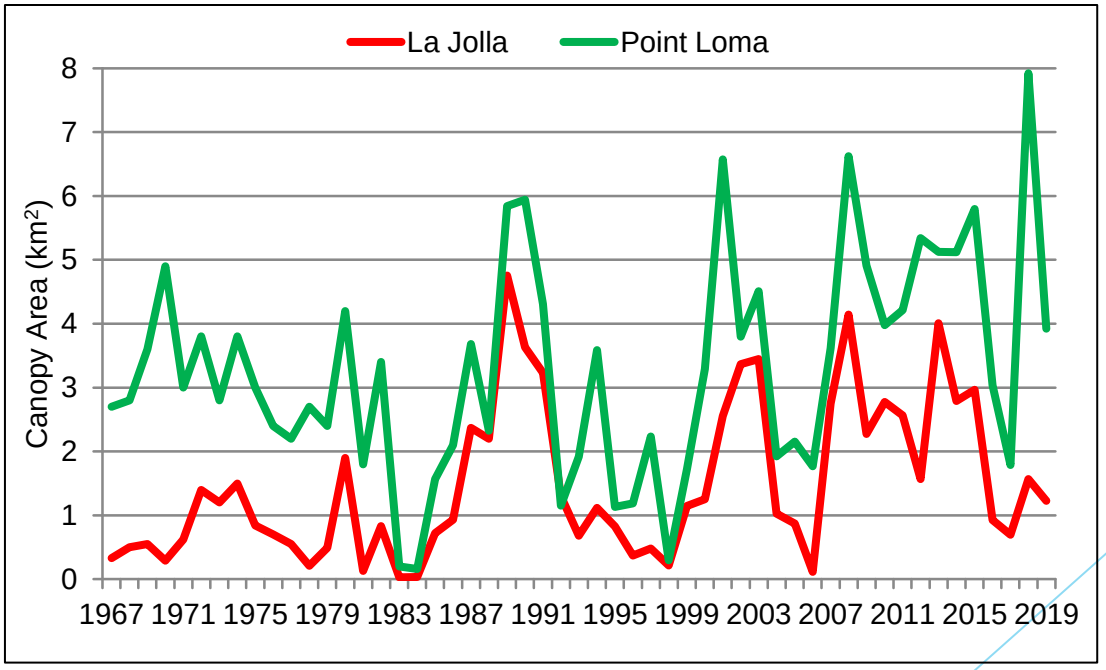
La Jolla

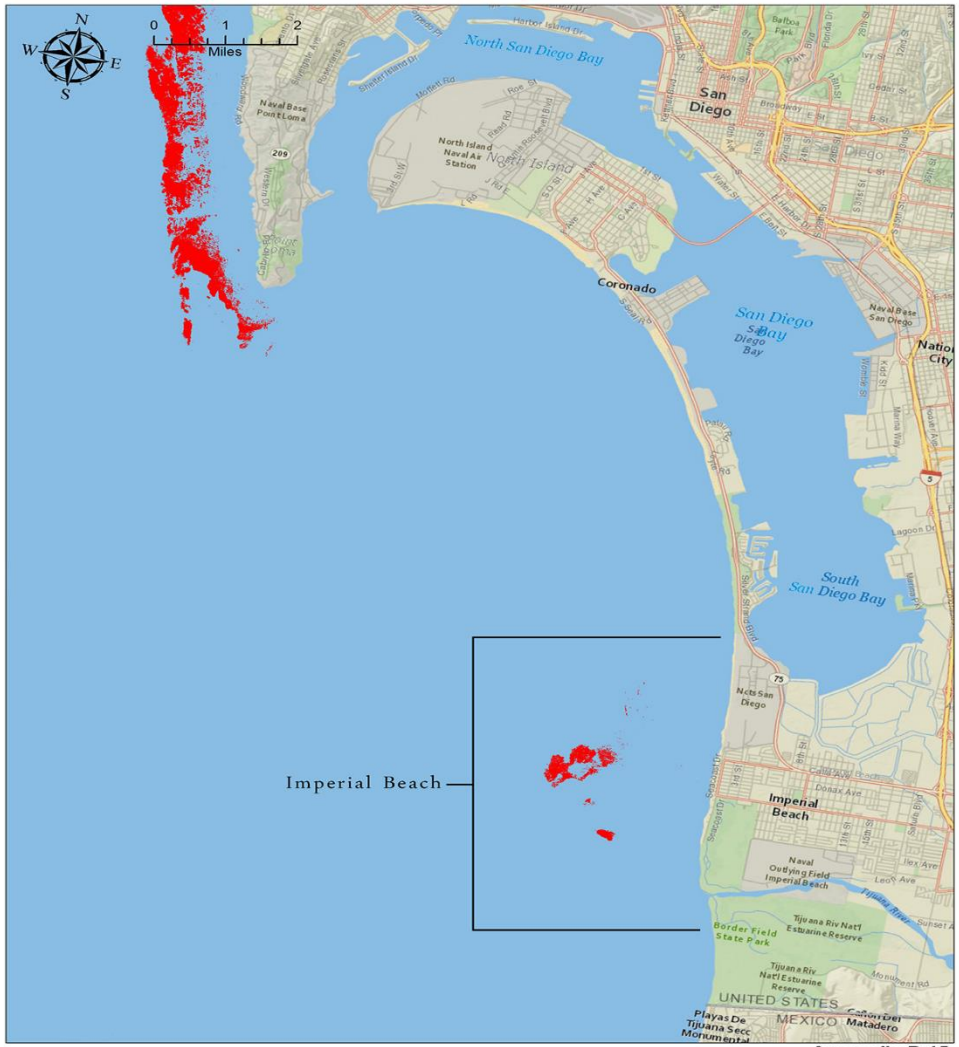


Point Loma





Imperial Beach



Appendix D.15

KELP BED		SURFACE CANOPY AREA IN 2019
North Laguna Beach	Smallest since:	2009
South Laguna Beach		2007
South Laguna		2006
Dana Point/Salt Creek		2006
Capistrano Beach		2005
San Clemente		2007
San Mateo Point		1998
San Onofre		2006
Horno Canyon		2011
Barn Kelp		2006
Encina Power Plant		2006
Encinitas		2005
Cardiff		2005
Solana Beach		1983

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FACTORS AFFECTING KELP BEDS

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Parnell, Dayton, Riser & Bulach. 2019. Evaluation of anthropogenic impacts on the San Diego coastal kelp forest ecosystem (2014 to 2019): final report.

- SoCal kelp forests subjected to severe temperature and nutrient stress from late 2013 through spring 2017
- BLOB present during 2014-2015 = anomalously warm surface waters across much of Northeast Pacific Ocean
- Strong El Niño occurred during fall 2015 and winter of 2016 - just as the BLOB dissipated
- El Niño/BLOB combo caused longest and warmest period ever observed in 103-year SST time series at Scripps Pier
- Spring upwelling in 2017 and 2018 brought cool, nutrient-laden waters onto SoCal inner continental shelf creating favorable conditions for giant kelp regrowth

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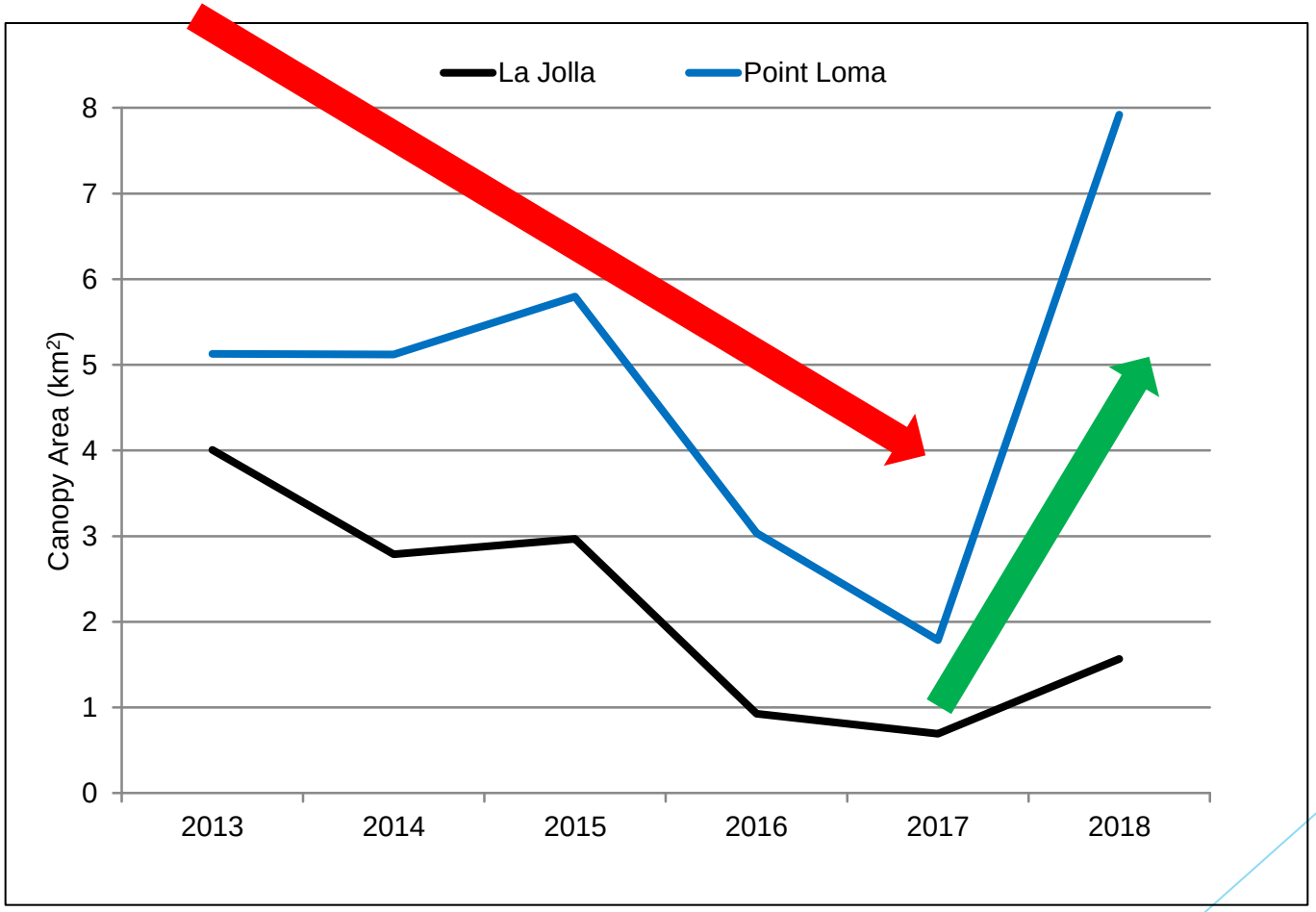
LA JOLLA & POINT LOMA KELP BEDS 2013-2018



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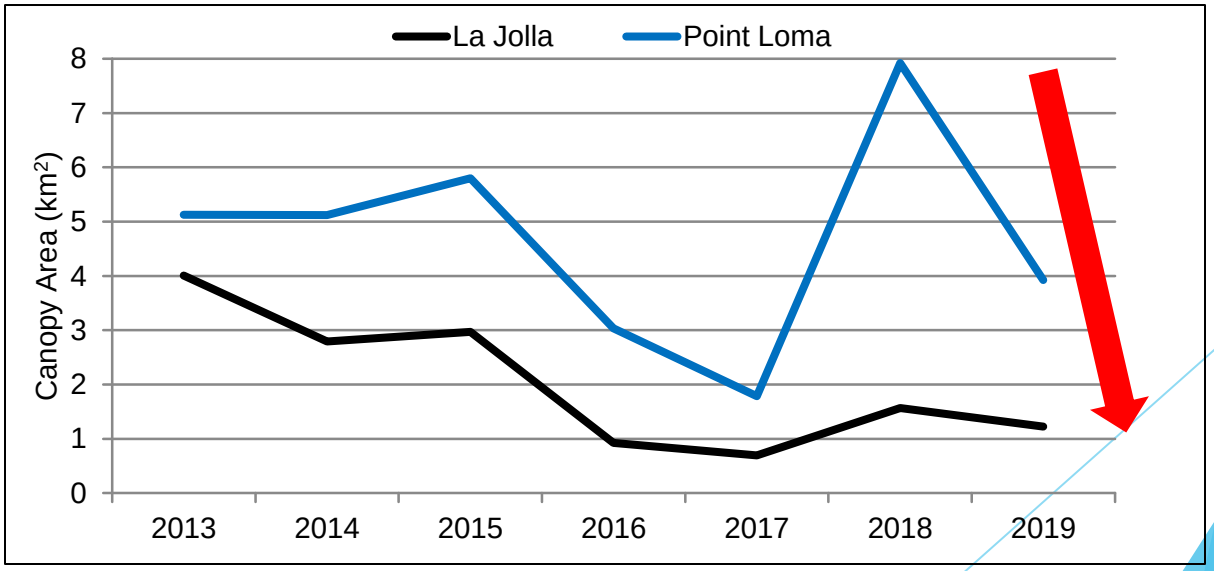
What Happened In 2019?

- In 2018, Region Nine Kelp beds had reached their maximum size in March or June (overflight data)
- Anomalously warm surface layer present during summer 2018 (Parnell et al, 2019)
- No surface canopy present throughout most of Region Nine in September or December 2018 (overflight data)
- Very little surface canopy present throughout most of Region Nine in March or June 2019, and almost none in September or December (except La Jolla and Point Loma)



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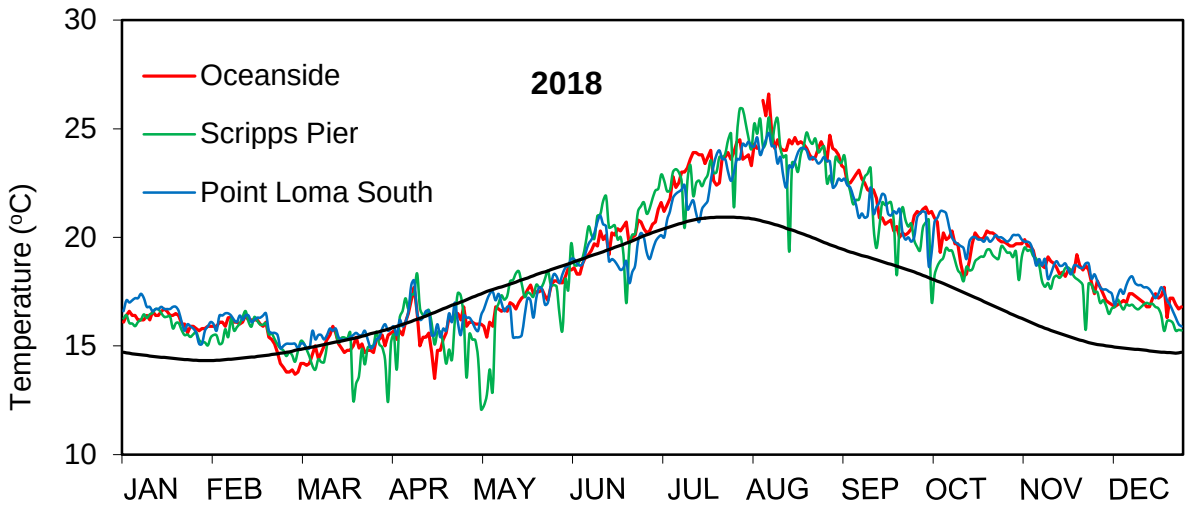
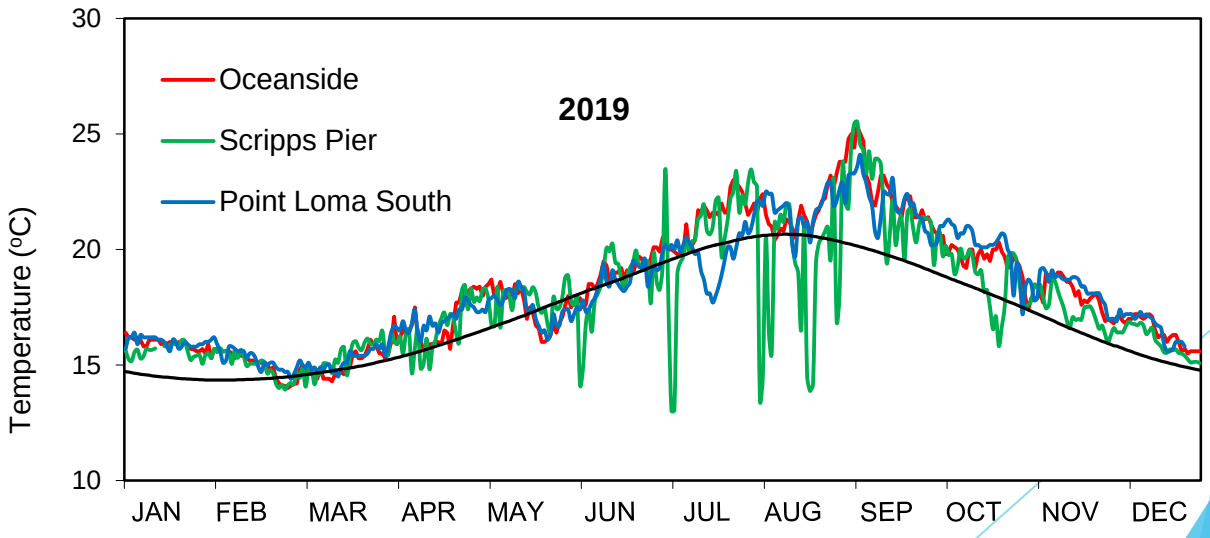
SST Values
2018 Versus 2019





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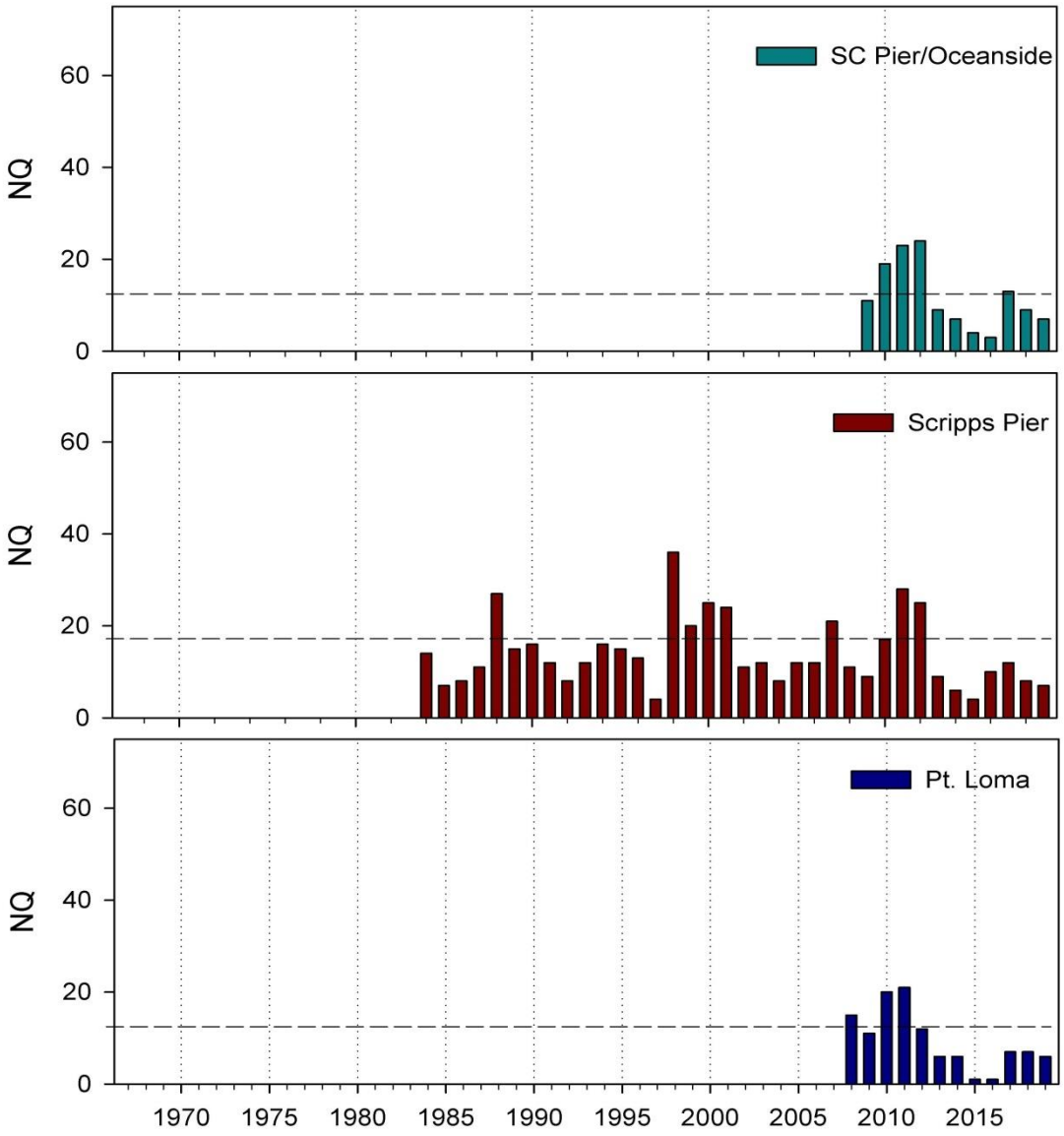
Nutrient Quotient Index Values



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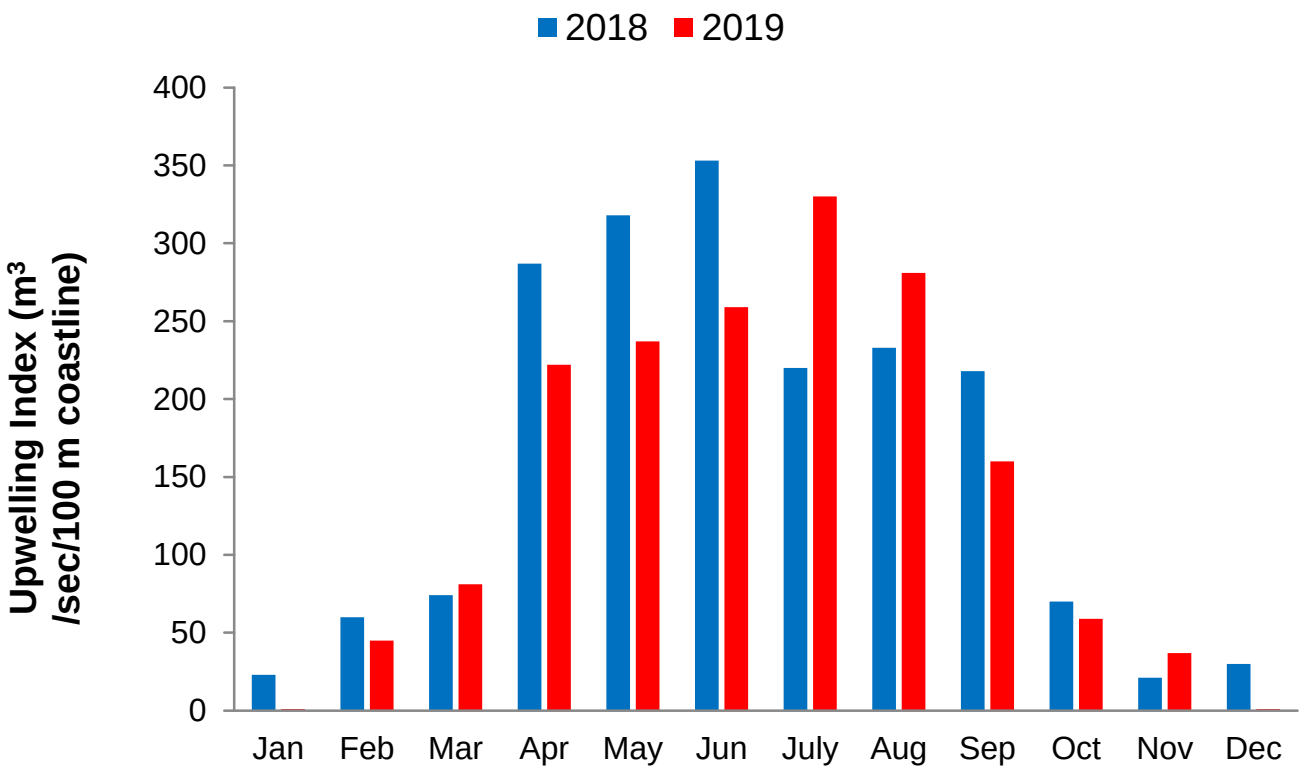
Monthly PFEL Upwelling Index



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Environmental Indices

- ENSO – continued in warm phase in 2019
- PDO – neutral in 2018, but warm regime in 2019
- NPGO – strongly negative from 2017 through 2019 indicating lower productivity

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CONCLUSIONS

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Conclusions

- 2019 was a bad year for kelp
  - 53 % decrease in total surface canopy for Region Nine
  - All kelp beds with visible surface canopy in 2018 decreased in size in 2019
- 10 kelp beds disappeared
- High SST values continued in 2019 (higher than normal during March, April, and May)
- Nutrient quotient values lower in 2019
- Monthly upwelling index values lower in 2019 during April, May, and June

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PREVIEW OF 2020

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Kelp Bed	April 15 estimated canopy	July 5 estimated canopy
North Laguna Beach	1.0	2.5
South Laguna Beach	-	0.5
South Laguna	-	-
Salt Creek-Dana Point	0.5	-
Capistrano Beach	0.5	-
San Clemente	-	-
San Mateo Point	-	-
San Onofre	-	-
Horno Canyon	-	-
Barn Kelp	-	-
Santa Margarita	-	-
North Carlsbad	NI	-
Agua Hedionda	-	-
Encina Power Plant	NI	-
Carlsbad State Beach	NI	-
Leucadia	NI	-
Encinitas	-	-
Cardiff	-	-
Solana Beach	NI	-
Del Mar	-	-
Torrey Pines Park	-	-
La Jolla Upper	1.0	1.0
La Jolla Lower	1.0	1.0
Point Loma Upper	2.5	3.0
Point Loma Lower	3.0	3.0
Imperial Beach	-	-

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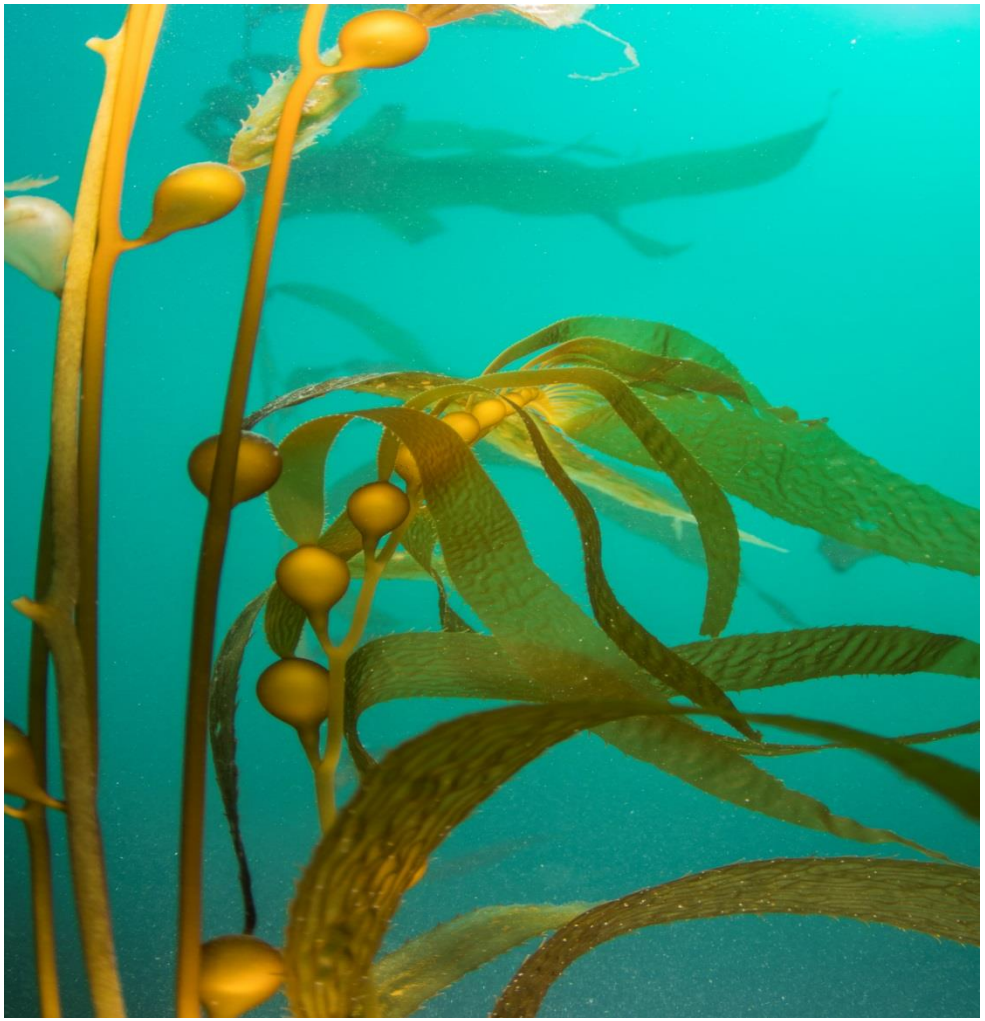
QUESTIONS?



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Permit Request 9/17/20

Proposal to study timing on *Sargassum horneri* removal as a technique for eradication

Prepared by:

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www.GetInspiredInc.org

Background: A report, published in the journal Nature in April 2020, identifies nine key components that are essential to rebuilding the oceans: salt marshes, mangroves, seagrasses, coral reefs, kelp, oyster reefs, fisheries, megafauna and the deep ocean. The authors recommend a range of actions including protecting species, harvesting wisely and restoring habitats (Duarte et al. 2020).

I have been doing ocean restoration work in Orange County since 2002 under the umbrella of several different organizations. In those 18 years, I have trained over 350 volunteer divers to help me with the tasks of restoring giant kelp (2002-2012), restocking and monitoring green abalone (2013-2015) for a study that was published in CDFG journal in 2017, and surveying green abalone intertidally and subtidally (2017-present) to map and calculate density of abalone in Orange county. We are currently raising green abalone for restocking in 2021-2025. In 2009, I started Get Inspired, a nonprofit 501c3 charity organization to continue this work and have partnered with CDFW on several projects. I have taught more than 12,000 students to grow abalone, white seabass, and kelp in custom classroom nurseries for outplanting to restore species along the coast of Orange County. Additionally, through a partnership with Hubbs SeaWorld Research Institute, I started the "seabass in the classroom" program (also in partnership with CDFW). All of these programs have integrated classroom lessons which accompany the culture systems. I go into the schools to teach topics in aquaculture, kelp forest ecology, and ocean chemistry.

Saraggsum horneri an invasive species native to Japan and Korea, is now prevalent along the mainland of Western North America from Baja California to Santa Barbara, and at three of the five Channel Islands (Anacapa, Santa Cruz and Santa Barbara) (Marks et al. 2015). Its continued expansion in the eastern Pacific may pose a major threat to the sustainability of native marine ecosystems. (Marks et al. 2015). Marks et al. 2017 recommends that *Sargassum horneri* be tracked, monitored, and studied so that impacts to resources can be assessed and potential management actions, such as eradication, can be evaluated. Kaplanis et al. 2016 mentioned that the rapid and uncontrolled spread of Sargassum has serious implications for their expansion

along the west coast of North America and that the ecological and economic consequences of these invasions require further research.

Forests of *Macrocystis pyrifera* naturally wax and wane throughout the natural cycles experienced along our coast. However, now with the invasion of Sargassum, there is competition for space for kelp to make its comeback resulting in a lack of food for grazers such as abalone which are already experiencing challenges in their recovery. Most herbivores do not prefer Sargassum as a food choice and this perhaps has led to its success (Marks et. al 2020). Through personal observations, Sargassum seems to whether the warm water events and large swells produced from the recent El nino event much better than the giant kelp. It forms such dense forests that fish cannot even swim through it, also limits light penetration to the reef further inhibiting competitors. In some cases, there has been a shift, since our kelp restoration activities, from a Macrocystis forest with healthy understory of other alga and encrusting organisms to a desolate Sargassum covered reef. I have an emotional and personal interest in the kelp forests of Orange County, having spent 12 years of my life restoring them. Wheeler North once told me that, "You don't just go in and restore the kelp and then walk away, it's going to need to be managed over time" I believe the that figuring out the best strategies for managing *Sargassum horneri*, especially, after the devastation of a warm water event, would be useful for the State of California. Up to this point, projects to add to this knowledge based have not met with success due to timing (Marks et al. 2017). So, to help in that effort, I am requesting permission to conduct a pilot project to study the timing of removal of *Sargassum horneri* as a method for controlling it. Just as we manage our terrestrial forests, we may need to start managing our kelp forests. This may especially be helpful to manage the return of Macrocystis after a warm water event or significant disruption to the ecosystem. My theory is that if it is cut and/or scrubbed off the reef at its base **just before or when** giant kelp is recruiting, the kelp will be able to regain its "real estate" on the reef and the Sargassum will be outcompeted. To ensure there is "room" on the reef for the kelp to recruit and because we know that Sargassum can recruit throughout the fall and early winter, we will test the timing of eradication to determine the best time for removal for reestablishment of the giant kelp. These tactics may then be employed in the future after a devastating event such as an El Nino, to bring the ecosystem back into balance faster.

Proposed project: Get Inspired team requests permission to conduct this experiment in Crystal Cove SMCA. We have seen a regime shift on this reef. It was once a lush garden of native alga and has recently become a Sargassum pasture with an articulated coralline understory. The premise of this project is that Macrocystis has lost its "real estate" or it's position in this reef community. By timing the removal of *Sargassum* with giant kelp recruitment, we may see the regime shift back to a kelp dominated forest. This SMCA has the least amount of protection, allowing for the take of finsfish, lobster and sea urchin. Over the last 5 years, we have observed a loss of diversity of algal species. The recent *2019 Status of the Kelp Beds* report from MBC Aquatic Sciences showed 98% kelp loss in this SMCA. Throughout the project period, we will monitor ocean conditions such as: sea surface temperature, kelp sporophyll release periods and kelp recruitment events whilst conducting targeted Sargassum removal to determine the best time to remove Sargassum to allow for kelp recruitment back on the reef and if it has an impact on

algal composition on the reef. We will notify CDFW the coordinates of sites before we begin as initial surveys will be required. Although "spreading" Sargassum is really no longer a threat in Southern California as it is ubiquitous, care will be taken during the reproductive season to remove the reproductive season to remove the whole plant. During the non-reproductive season, April-October, we will just pull the invasive algae.

Method:

Two study areas will be chosen where we can set up 4 treatment sites in each one. All the treatment sites will be 10m x10m in size. The study area will have *Macrocystis pyrifera* and *Sargassum horneri* present. A HOBO temperature logger will be installed in the study area. This study will be over the expanse of the SMCA in areas where kelp once grew and has disappeared.

All sites will have an initial survey of Sargassum and other native algae with band transects or quadrats (depending on density).

Each dive will have a scoring system for the sporophyll release, kelp recruitment, and Sargassum development stage. We will survey the study area during each dive to determine the spore release quotient on the giant kelp. We will observe each plant give it a score and tally up the scores at the end of the dive. Development stage of Sargassum will also be noted on each dive.

Spore release

1- Indicates sporophylls are golden brown and the same color as the kelp blades
2- Indicates sporphylls are smooth or darker in color
3- Indicates sporphylls are smooth texture, darker in color, and have necrotic ends indicating max spore release is taking place.

Kelp recruitment

0- Indicates no sign of kelp recruitment
1- Indicates spade shaped brown kelp recruits on the reef (species unknown)
2- Indicates giant kelp recruits confirmed on reef site

Once a #2 score is confirmed band transects or quadrats will be conducted to count recruits and determine density. Same treatment will be done on the control site.

Sargassum Development stage (as described by Miller and Engle 2009)

1- Fern-like stage <5cm
2- Immature, no receptacles
3- Fertile, actively reproducing
4- Senescent, after reproduction

We will set up 2 control sites in Laguna Beach SMR where no Sargassum removal will occur

Treatment site 1 will have continuous removal of sargassum through the study period

Treatment site 2 we will remove Sargassum starting when there is a dip in sea surface temperatures below 15 C ~December 2020

Treatment site 3 we will remove Sargassum starting in January 2021

Treatment site 4 we will remove Sargassum starting in February 2021

Importance and Benefit: Kelps are a vital California resource and an essential component to our Eastern Pacific ecosystem as seen in the recent Northern California kelp ecosystem collapse. We rely on them to sustain us we use them for fishing, diving, and we have thought enough to protect them with no take zones to allow the ecosystems to flourish. They also are an important habitat and food source for reef species. These critical habitats are facing more and more threats. From warm water events to urchin invasions and invasive species competition, we need to know how to effectively and quickly reestablish these habitats to sustain them for as long as we can. Just like we manage our forests on land, we should be managing the health of these important California ecosystems. We believe that this work is essential to the recovery of our kelp forests and for the management of our kelp ecosystem that will benefit everyone and we respectfully request your permission to investigate these methods.

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Presence of *Sargassum horneri* at Todos Santos Bay, Baja California, Mexico: Its Effects on the Local Macroalgae Community

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Abstract

To describe the annual cycle of *Sargassum horneri* in Mexican waters, we selected two sites differing in their degree of wave exposure and sediment type: Rincón de Ballenas (RB), and Rancho Packard (RP). From June 2009 to April 2010 we followed the seasonal changes in *S. horneri* density and biomass along two intertidal transects per site. The effects of this non-indigenous species on the local macroalgae community were assessed by comparing their species composition, density, biomass, species richness, and diversity index in quadrats with and without *S. horneri*. There were significant differences in *S. horneri* density and biomass between sites ($P < 0.001$). At RB the invasive alga density average was 2 ± 0.94 individual m^{-2}, with a mean biomass of 4 ± 0.95 g DW m^{-2}. At RP, *S. horneri* density average was 10 ± 0.96 individual m^{-2}, and mean biomass of 102 ± 0.97 g DW m^{-2}. At RB, the invasive alga promoted a significant reduction in the four selected structural variables, and the corticated macrophytes and the foliose functional forms were severely reduced. At RP, there were only marginally significant effects ($P = 0.06$) of *S. horneri* presence on the local macroalgae community, and higher density, biomass, and diversity values were found when *S. horneri* was present. Most of the functional forms were found, even if the invasive alga was present. At both locations, the highest biomass corresponded to the articulated calcareous functional form. These contrasting results could be due to the fact that the native macroalgae community has already been altered by the early invasion of *S. muticum*, with the most resilient species and functional forms remaining in place. One of the most important changes we noticed is the severe reduction of the canopy forming species at both sites.

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Keywords

Annual Cycle, Community Structure, Diversity Index, Functional Forms, Invasive Alga, Species Richness

1. Introduction

Non-indigenous species (NIS) represent a major concern to marine scientists as the ecosystem in which they arrive in is modified adversely. This change takes place through the ecological interactions they establish with the native species and through direct or indirect physical or chemical changes in the habitat itself. The speed of habitat change is also coupled to the stability or resilience of the ecosystem, so the impact can have different scales in space and time [1].

While experimental work supports the idea that diverse communities show greater resistance to invasion, it is not clear if this results from resource use complementarity, or from an increasing occurrence of suppressive species in more diverse communities [2]. To understand the mechanisms driving this response, interest has shifted from species richness to the functional roles that species or groups of species play. Functional groups are defined as non-phylogenetic grouping of species that perform similarly in an ecosystem based on a set of common biological attributes. Functional groups can be defined in relation to either the contribution of species to ecosystem processes, such as carbon or water cycling, or the response of species to changes in environmental variables, such as climatic variables or disturbance [3]. The number and identity of functional groups within a community may dictate the level of invasibility, implying that the invasion of a coastal habitat will only be promoted through loss of a whole functional group rather than the loss of one or a few members of that group [2].

As marine ecosystems are relatively open, with fewer limits than terrestrial systems to organism dispersal and energy flow, the irreversible impacts of exotic species have profound consequences on ecological systems [2]. Macroalgae are considered to be especially worrying NIMS (non-indigenous marine species) as they may alter ecosystem structure and function by monopolizing space, developing into ecosystem engineers, changing food webs, and spreading beyond their initial point of introduction through efficient dispersal capacities [4] [5]. The success of a non-indigenous species depends on its mode of reproduction, growth rate and dispersive potential [6] [7].

The fucoid genus *Sargassum* is monoecious, highly fecund, and possesses vesicles that allow the reproductive fronds produced annually to drift with currents and inoculate new locations [7]-[9]. Due to its ability to colonize hard and soft substrata, the total area of marine sediments open to occupation by members of the genus *Sargassum* is vast, and cumulative habitat modification could be very significant [10]. The main barrier to colonization of the rock is the presence of algal cover [11].

Once established, these species can accumulate high biomass and thus become a strong competitor for space and light [12]. *Sargassum* invasions have significantly impacted the structure of indigenous algal communities in North America and Europe, through competitive displacement and/or exclusion [7] [13]. Several studies have reported the reduction of functional groups, like the thick leathery and coarsely branched algae and native understory algae through strong competitive interactions with adult individuals of *S. muticum* [7] [14]-[17].

Sargassum horneri is native from Asia, and distributed in Japan, Korea, Hong Kong (China), Chinese Taipei and China Mainland [18]. It was observed in Catalina Island, California, in 2003 [19]. In Baja California, well-established populations of this species were observed in Todos Santos Bay in 2007 [20], from where it had extended along the temperate waters of the Baja California Peninsula [21]. However, no description exists of the population structure of *S. horneri* in Mexican waters. For this reason, we decided to study the annual growth cycle inside the Todos Santos bay. We were also interested in assessing the ecological impact of this non-indigenous algal species on the structure of the local community of macroalgae. For this purpose, we selected two locations that differed in substrate type and wave exposure degree, and measured the seasonal influence of Sea Surface Temperature (SST), Photosynthetically Active Radiation (PAR), and air-exposure hours, on *S. horneri* density and biomass. Simultaneously, we determined the changes in the species composition, density, and biomass of the local macroalgae community. Algal species were classified into functional groups to identify if their number and types differed as a function of the presence or absence of *S. horneri*. We expected *S. horneri* to be better represented in the most exposed site, where its high density and biomass would result in a significant re-

duction of macroalgae, density, and biomass, and a change in species composition. We anticipated the loss or reduction of the canopy forming species, representing the more morphologically complex functional forms.

2. Materials and Methods

2.1. Study Site

The Todos Santos bay is located about 130 km south of the USA-Mexico border, on the northwest coast of the Baja California peninsula, at ~31˚47'N; 116˚43'W (**Figure 1**).

The NW oceanic boundary is defined by the ridge of a broad shoal between the Todos Santos islands and the mainland shoreline. The SW boundary is defined as the shortest distance between a prominent point, known as Punta Banda, and the Todos Santos islands, and is marked by a 6 km wide submarine canyon. The bay has a surface area of ~240 km^2. Maximum depth within the bay is ~100 m, except for the canyon, reaching to 400 m and draining down the continental slope [22].

Winds dominate the coastal circulation. Prevailing northwesterly winds, during spring and summer, drive water into the bay from the NW. Only during some winter storms and offshore Santa Ana conditions, water enters from the southwestern [23]. There is an apparent convergence zone within the bay, near the mouth of the Punta Banda estuary, along the eastern shore [24]. Sediment transport into and within the bay follows the same circulation pattern [25]. The bay is under the upwelling influence during periods of NW winds, a prominent feature of much of the Pacific coast of the USA and northern Baja California [26], and some authors have documented the influence of the local upwelling on water properties near the mouth during the springtime upwelling period [22] [27].

The two selected study sites, Rincón de Ballenas (RB), and Rancho Packard (RP), are located in the protected side of the Punta Banda peninsula, which is made up of shale and sandstone, forming high, almost vertical cliffs, which are interrupted locally by small pocket beaches made out of boulders [28]. Wave turbulence and littoral currents separate the material supplied by cliff erosion, allowing only grain sizes greater than 3.5ϕ (coarse fraction) to be deposited on the beach, while smaller sizes (fine fraction) are suspended and transported offshore [28]. Loose gravel predominates at Rincón de Ballenas and hard rock at Rancho Packard (**Figure 1**) [28].

The west coast of Baja California is characterized for having a mixed semidiurnal tidal cycle, with astronomical tides of higher amplitude during winter, season in which the strong storms originate bigger waves. The sum

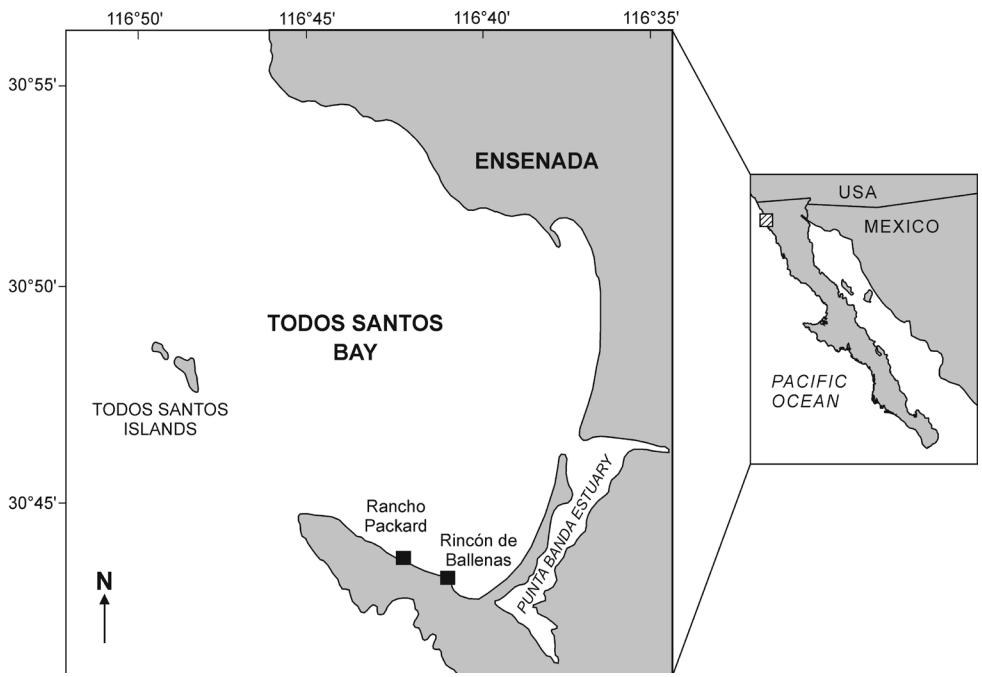

Figure 1. Map of the Baja California peninsula, indicating where the city of Ensenada is located. The inset shows the Todos Santos Bay and the two sampling stations in the protected side of the Punta Banda point.

of these two components results in a larger total wave amplitude. As a consequence, exposure hours are greater during winter. Of our two study sites, RP is more exposed to waves, than RB [29].

2.2. Sampling Design

Sampling took place from June 2009 to April 2010 during the Mean Lower Low Water tidal level (MLLW). Each season was represented by two months: June and July 2009, represented summer; October and November, autumn; December 2009 and January 2010, for winter, and March and April 2010, represented spring.

At each site we installed two transects perpendicular to the shore, separated by about 100 m. Their length and depth varied as a function of the topography. At RB, *S. horneri* was distributed between −0.2 and −0.8 m MLLW, corresponding to the low intertidal level; at RP, its distribution was between +0.5 and −0.2 m MLLW, in the middle and high intertidal levels (**Figure 2**).

2.3. Field Work

In order to cover the whole transect, samples were collected in the following manner; in every visit to the field we placed a 10 m rope along each transect, with marks every 0.5 m. At the beginning of every season, ten 0.25 m^2 quadrats were collected every meter starting at the 0 distance, and in the second seasonal visit, ten samples were also collected every meter, but starting at the 0.5 m mark.

Sampling was destructive, following the methodology described by [29]. Macroalgae were detached from the

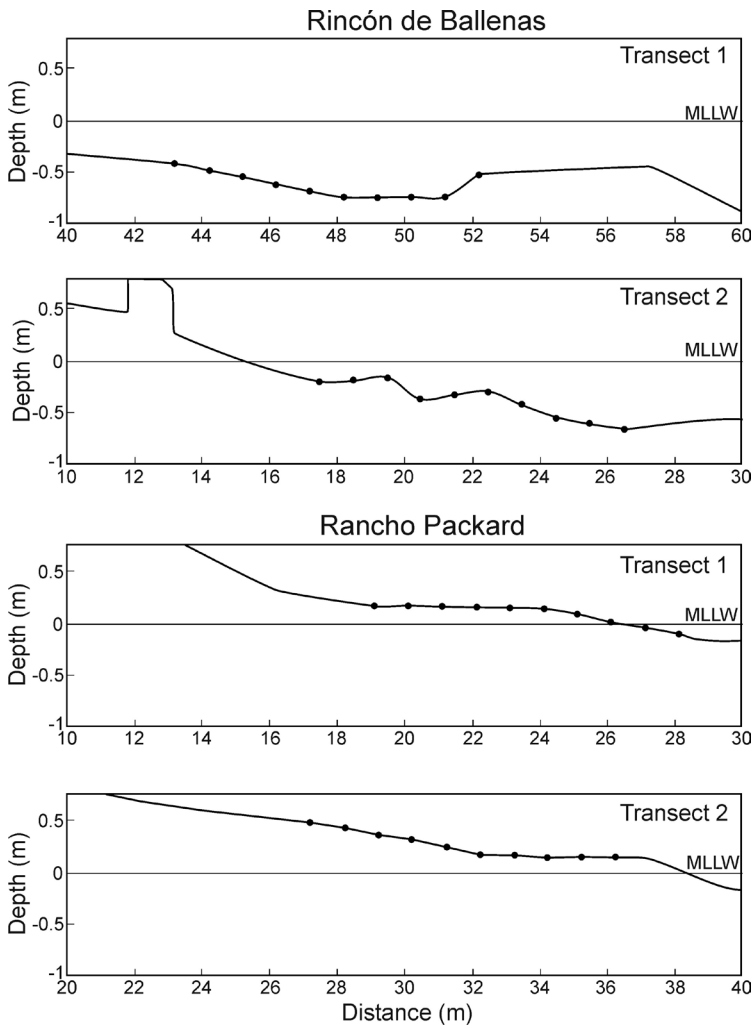

Figure 2. Vertical distribution of *S. horneri* at each of the established transects.

substrate by hand. All collected material was placed in labeled plastic bags, kept cool until arrival to the laboratory. Once in the lab, macroalgae were frozen until processing.

Sea Surface Temperature (SST) and Photosynthetically Active Radiation (PAR) data from May 2009 to May 2010 were downloaded from NASA's Ocean Color Satellite (http://oceancolor.gsfc.nasa.gov/seadas/). The use of the MODIS sensor provides a 4 km resolution, so the same data set was used for both sampling sites. For every site and sampling depth, we assessed the seasonal variations in tidal exposure, adding the number of hours that the sea level was lower than the selected reference level (Sea Level Laboratory, CICESE).

2.4. Laboratory Work

Macroalgae were defrosted and rinsed with fresh water to remove salts and sediment. Later, placed in plastic trays, and with tweezers, all epiphytic material, whether vegetal or animal, was removed. Algae were first separated into groups: Chlorophyta, Phaeophyta, and Rhodophyta, and then, all members of each group were identified at the species level. For this, histological cuts were performed, and tissue characteristics were analyzed under microscope. We used the taxonomic keys and classification system of [30]. Density was expressed as No. individuals of each species m^{-2}. Each species was oven dried at 60˚C for 24 hours, and weighed (±0.1 g) to determine its biomass, expressed as g DW m^{-2}. Average density and biomass values were determined per site, depth, and month. Species were classified infunctional groups following [31], as: filamentous algae, foliose algae, corticated foliose algae, corticated macrophytes, leathery macrophyes, articulated calcareous algae, and crustose algae.

2.5. Data Analyses

S. horneri density and biomass data were analyzed using non-parametric statistics, since data did not followed a normal distribution. Significant differences between sites were explored with the U Mann-Whitney test. Differences among depths and months were analyzed with a one-way non-parametric ANOVA, Kruskall-Wallis. When non-significant differences between depth levels were found, such levels were pooled together to increase the power of the statistical tests [32].

The tendency between density and biomass with sea surface temperature, irradiance, and air exposure hours, was analyzed with the Spearman rank correlation test [33]. For all statistical analyses alpha was set at 0.05, and tests were run using the program STATISTICA 7 for Windows (2002).

2.6. Community Analyses

To determine community diversity, we used two attributes of community structure: species richness (S), and the Shannon-Wiener diversity index (H') [34]:

$$H' = -\sum_i \rho_i \left(\log p_i\right)$$

where ρ_i is the proportion of the total count arising from the ith species.

Both attributes were assessed when *S. hornerii* was present, and absent. Differences in H' under both conditions were tested with Hutchinson test [33].

We analyzed the spatial distribution of the functional groups when *S. horneri* was present, or absent, using their biomass values. For this, a non-metric MDS using the package "Vegan" for R platform was used [35].

3. Results

Following the annual cycle of maximum values during summer, and minimum values during winter, surface water temperature varied between 15.5˚C and 21.1˚C, and irradiance between 22.8 and 55.2 $mol \cdot m^{-2} \cdot d^{-1}$. Air exposure hours varied by one order of magnitude between sites, with a total of 77 ± 0.5 hours at RB, and 685 ± 53 hours at RP. Winter was the season with more exposure hours at RB, and spring had the highest number of exposure hours at RP.

We found highly significant differences in annual mean *S. horneri* density and biomass between sites ($P < 0.001$), but not between tidal depths at any site ($P > 0.05$), and only at RP there were significant differences between sampled seasons ($P < 0.05$). At RB the invasive alga was present during October, November, and March, with an irregular distribution along the sampled depths. Its average density was 2 ± 0.94 individual m^{-2}, and av-

erage biomass, 4 ± 0.95 g DW m^{-2}. At RP, *S. horneri* was present during all sampled months, except June, but because of bad weather we could not collect samples in April. Also at this site, *S. horneri* vertical distribution was irregular. Average density was 10 ± 0.96 individual m^{-2}, with the lowest value during summer, 4 ± 0.9 individual m^{-2}, and the highest during autumn, 17 ± 0.98 individual m^{-2}. Average biomass for all the study period at RP was 102 ± 0.97 g DW m^{-2}, with the lowest values in summer, 12 ± 0.96 g DW m^{-2}, and the highest in spring, 292 ± 0.98 g DW m^{-2}.

At RB there were no significant correlations between *S. horneri* density and biomass with the environmental variables, but at RP, *S. horneri* density and biomass were negatively correlated with SST: ($r = -0.34$, $P < 0.001$), and ($r = -0.53$, $P < 0.001$) respectively; biomass was also negatively correlated with PAR ($r = -0.25$, $P < 0.05$). Air exposure hours yield no significant correlations with the biological data set either at RB or at RP.

3.1. Community Structure

A total of 39 macroalgal species was recorded during this study, of which 23 species were Rhodophyta, 11 Phaeophyta, and 5 Chlorophyta. The highest species richness corresponded to RB, with 29 species, while 25 species characterized RP. Highly significant differences between sites were found for macroalgae density ($P < 0.001$), and biomass ($P < 0.001$): 10 ± 0.9 individuals m^{-2}, and 66 ± 0.98 g DW m^{-2}, at RB, versus 14 ± 0.97 individuals m^{-2}, and 120 ± 0.96 g DW m^{-2} at RP.

Of the 29 macroalgae species recorded at RB, the Rhodophyta were the most diverse, with 16 species, followed by the Phaeophyta with 9, and the Chlorophyta with 4 species (**Table 1**).

Table 1. List of macroalgae species found at Rincón de Ballenas, between June 2009 and April 2010, when *S. horneri* was present (+), or absent (−). Their functional form was determined according to [31].

Division	Species	Functional form	Condition
Chlorophyta	*Codium fragile*	Corticated macrophyte	(−)
	Ulva californica	Foliose	(−)
	Ulva fasciata	Foliose	(−)
	Ulva nematoidea	Foliose	(−)
Phaeophyta	*Colpomenia sinuosa*	Corticated macrophyte	(−)
	Colpomenia tuberculata	Corticated macrophyte	(−)
	Dictyota flabellata	Corticated foliose	(+) (−)
	Dictyopteris undulata	Corticated foliose	(+) (−)
Rhodophyta	*Petrospongium rugosum*	Crustose	(−)
	Sargassum muticum	Leathery macrophyte	(+) (−)
	Silvetia compressa	Leathery macrophyte	(+)
	Sphacelaria californica	Filamentous	(−)
	Zonaria farlowii	Corticated foliose	(+) (−)
	Centroceras clavulatum	Corticated macrophyte	(−)
	Chondria californica	Corticated macrophyte	(−)
	Chondria decipiens	Corticated macrophyte	(−)
	Chondrocanthus canaliculatus	Corticated macrophyte	(−)
	Corallina officinalis	Articulated calcareous	(+)
	Corallina polysticha	Articulated calcareous	(−)
	Corallina vancouverensis	Articulated calcareous	(+) (−)
	Cryptopleura ramosa	Foliose	(−)
	Endarachne binghamiae	Corticated macrophyte	(−)
	Hypnea valentiae	Corticated macrophyte	(−)
	Jania crassa	Articulated calcareous	(+) (−)
	Jania rosea	Articulated calcareous	(+) (−)
	Laurencia pacifica	Corticated macrophyte	(+) (−)
	Lithotrix aspergillum	Articulated calcareous	(+) (−)
	Pterocladiella capillacea	Corticated macrophyte	(+) (−)
	Smithora naiadum	Foliose	(−)

Densities were higher for *Corallina officinalis*, and *Sargassum muticum*. The highest biomass values corresponded to the red alga *Corallina officinalis*, and to the green alga *Ulva fasciata*. The analysis per group shows that density was slightly higher for the red algae, 8.23 ± 0.73; followed by the brown, 7.55 ± 1.32, and lower for the green algae, with 7 ± 0.86 individuals m^{-2}. With respect to biomass, the green algae showed the highest values with 163 ± 72.8 g DW m^{-2}, followed by the red, 75.76 ± 25.5, and the brown algae, 41.3 ± 16.09 g DW m^{-2}. At RP, there were 14 species of Rhodophyta, 7 species of Phaeophyta, and 4 Chlorophyta (**Table 2**).

The red algae with highest density were *Corallina frondescens*, *Centroceras clavulatum*, and *Lithothrix aspergillum*, and the brown algae *Dictyopteris undulata*, and *Petroglosum rugosum*. The species with highest biomass were the red algae: *Lithothrix aspergillum*, *Corallina frondescens*, *C. pinnatifolia*, and *Centroceras clavulatum*. At the group level, density decreased from the brown, to the red, and the green algae: 12.57 ± 2.34; 10.66 ± 1.67, and 6 ± 1.73 individuals m^{-2} respectively. The red algae had the highest biomass: 133.86 ± 32.9, followed by the brown, 56 ± 7.1, and the green, 8 ± 1.2 g DW m^{-2}.

3.1.1. Influence of *S. horneri* at RB

The most frequently present macroalgae had the greatest contribution in determining the community structure: *Dictyota flabellata*, *Dictyopteris undulata*, and *Sargassum muticum*, among the brown algae; *Corallina vancouverensis*, *Hypnea valentiae*, *Jania rosea*, and *Laurencia pacifica*, among the red algae. Peak density values were for *Corallina officinalis* and *Laurencia pacifica*, when *S. horneri* was present; when it was absent, highest density values were for *S. muticum*. When *S. horneri* was present, *Corallina officinalis*, and *Jania rosea* had the greatest biomass; when *S. horneri* was absent, peak biomass values corresponded to *Ulva fasciata*, and *Ulva californica*.

Table 2. List of macroalgae species found at Rancho Packard, between June 2009 and April 2010, when *S. horneri* was present (+), or absent (−). Their functional form was determined according to [31].

Division	Species	Functional form	Condition
Chlorophyta	*Codium fragile*	Corticated macrophyte	(+)
	Codium hubbsi	Corticated macrophyte	(−)
	Ulva californica	Foliose	(−)
	Ulva nematoidea	Foliose	(+) (−)
Phaeophyta	*Colpomenia sinuosa*	Corticated macrophyte	(+) (−)
	Dictyopteris undulata	Corticated foliose	(+) (−)
	Dictyota flabellata	Corticated foliose	(+) (−)
	Petrospongium rugosum	Crustose	(+) (−)
	Sargassum muticum	Leathery macrophyte	(+) (−)
	Silvetia compressadeliquescens	Leathery macrophyte	(−)
	Zonaria farlowii	Corticated foliose	(+) (−)
Rhodophyta	*Amphiroa zonata*	Articulated calcareous	(+) (−)
	Centroceras clavulatum	Corticated macrophyte	(+) (−)
	Corallina frondescens	Articulated calcareous	(+) (−)
	Corallina pinnatifolia	Articulated calcareous	(+)
	Corallina vancouverensis	Articulated calcareous	(+) (−)
	Endarachne binghamiae	Corticated macrophyte	(+)
	Hypnea valentiae	Corticated macrophyte	(+) (−)
	Laurencia pacifica	Corticated macrophyte	(+) (−)
	Lithrotrix aspergillum	Articulated calcareous	(+) (−)
	Mazzaella affinis	Corticated macrophyte	(−)
	Mazzaella leptorhynchus	Corticated macrophyte	(+) (−)
	Pterocladia caloglossoides	Corticated macrophyte	(+)
	Pterocladia californica	Corticated macrophyte	(+)
	Pterocladia capillacea	Corticated macrophyte	(+) (−)

Macroalgae density showed significant differences between the *S. horneri* presence and absence condition ($P < 0.01$), with a mean of 2.977 ± 4.33 individuals m^{-2}, under presence condition, and 9.647 ± 2.232 individuals m^{-2} when *S. horneri* was absent. The same was true for macroalgae biomass ($P < 0.01$), with a mean of 18.125 ± 28.99 g DW m^{-2} for the invasive alga presence condition, and 76.428 ± 48.75 for the absence condition. Species richness (S) was higher when *S. horneri* was absent, with 28 species, than when the invasive algae was present, 13 species. Also, the diversity index (H'), was higher when *S. horneri* was absent, 0.884, than when it was present, 0.281 ($P < 0.0001$).

There were highly significant differences in macroalgae density through time ($P < 0.01$), with peak values between October and December, with values ranging between 8 and 13 individuals m^{-2} (**Figure 3(a)**). Macroalgae biomass also showed significant differences through time ($P < 0.01$), with a first peak in November, and a second peak in March, for both presence-absence conditions (**Figure 3(b)**). Species richness (*S*) was highest in June, under *S. horneri* absence, and in November, under *S. horneri* presence (**Figure 3(c)**). The species diversity

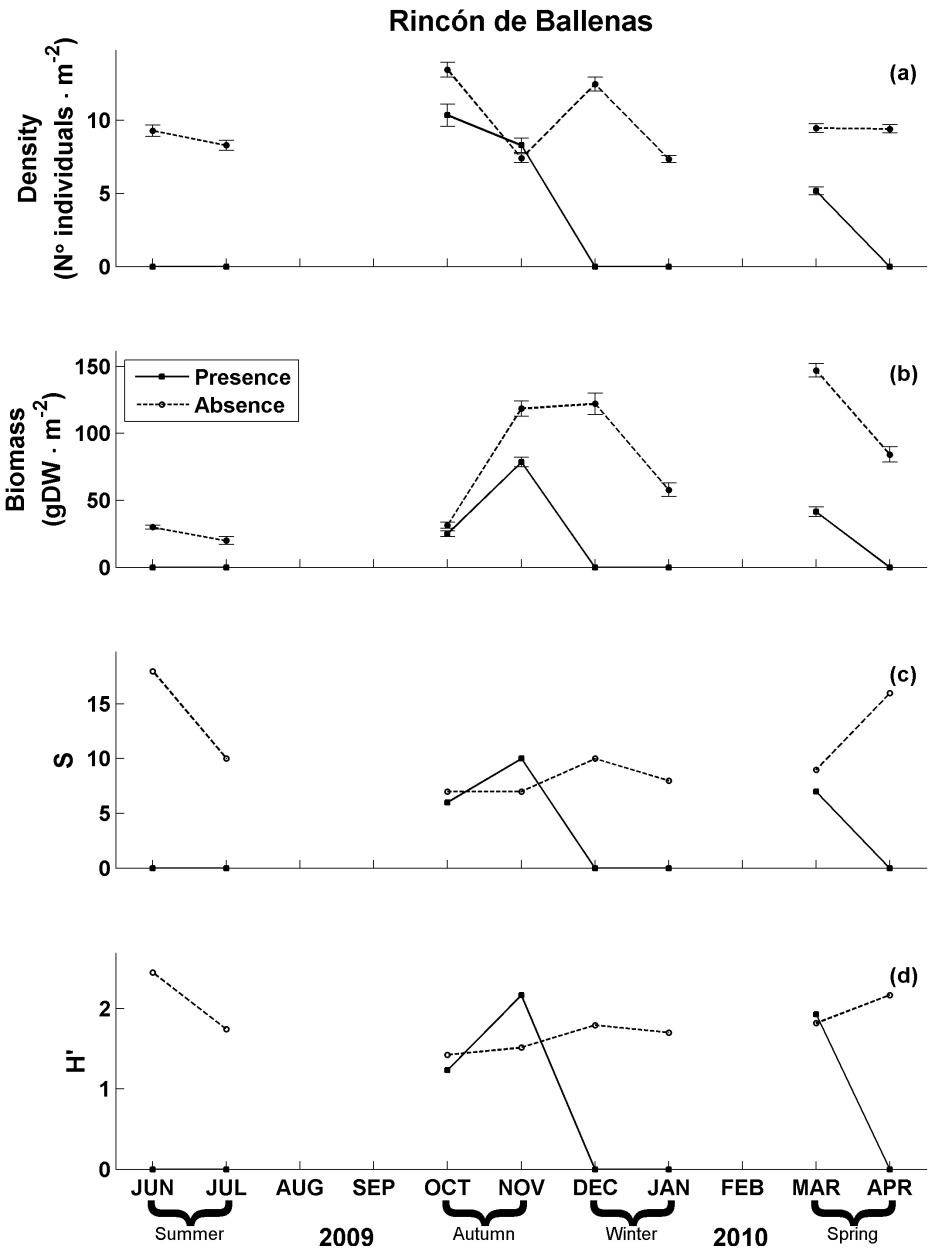

Figure 3. Seasonal variations in the selected structural variables in quadrats with and without *S. horneri* at RB.

index, H', peaked in November when the invasive alga was present, and in June and April when it was absent, these differences being highly significant (P < 0.001) (**Figure 3(d)**).

The functional form of each species, and whether it was found when *S. horneri* was present (+), absent (−), or under both conditions (+) (−), is indicated in **Table 1**. It can be noticed that the corticated macrophytes and the foliose functional forms were the most affected, as the 14 species contained in these groups could only be found when the invasive alga was absent.

The MDS shows, to the left, a compact group formed by the low biomass values of all functional groups present; however, to the right, it can be noticed that the articulated calcareous reached the higher biomass values, regardless of whether the invasive algae was present, or absent (**Figure 4**).

3.1.2. Influence of *S. horneri* at RP

The macroalgae with the highest contribution to the community structure were: *Dyctiopteris undulata*, *Sargassum muticum*, *Zonaria farlowii*, and *Dictyota flabellata*, among the brown algae, and: *Lithothrix aspergillum*, *Centroceras clavullatum*, and *Corallina vancouverensis*, among the red algae.

When *S. horneri* was present, the species with more individuals per m^2 were: *Centroceras clavulatum*, *Corallina frondescens*, *Mazzaella leptorhynchus*, and *Dictyopteris undulata*. When *S. horneri* was absent, *Lithothrix aspergillum* and *Petrospongium rugosum* were the species with highest densities. When *S. horneri* was present, the algae with the highest biomass values were: *Corallina frondescens*, and *Lithothrix aspergillum*. This last species, also had the highest biomass when *S. horneri* was absent, followed by *Centroceras clavullatum*.

The comparison of macroalgae density between the presence-absence conditions was slightly marginal (P = 0.06). Mean values were 9.641 ± 5.52 individual m^{-2} when *S. horneri* was present and 4.880 ± 6.88 individual m^{-2} when it was absent. The same significance level (P = 0.06) was found for the biomass comparison, with means of 74.489 ± 60.21 g DW m^{-2} under presence of the invasive alga, and 46.239 ± 82.33 g DW m^{-2} when it was absent. Species richness was similar when *S. horneri* was present, with 22 species, at when it was absent, 21 species. However, there were significant differences in the diversity index, with a higher value when the invasive alga was present, 0.740, than when it was absent 0.676 (P < 0.005). We also found that the selected variables showed changes as a function of time, with peak values in October, when the invasive alga was present, and in June when it was absent (P < 0.001) (**Figure 5**).

At this site, most of the species were present independently of the presence of *S. horneri*, with only three species, all with different functional forms, being affected by its presence (**Table 2**).

The MDS showed that, as in RB, the articulated calcareous group reaches the highest biomass values, followed by the corticated macrophytes (**Figure 6**).

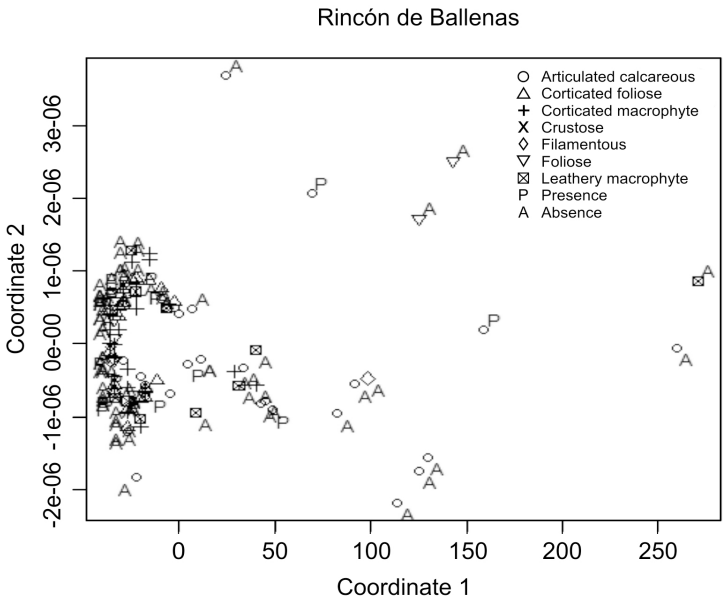

Figure 4. Distribution of the macroalgae functional forms at RB along the two coordinate principal axes.

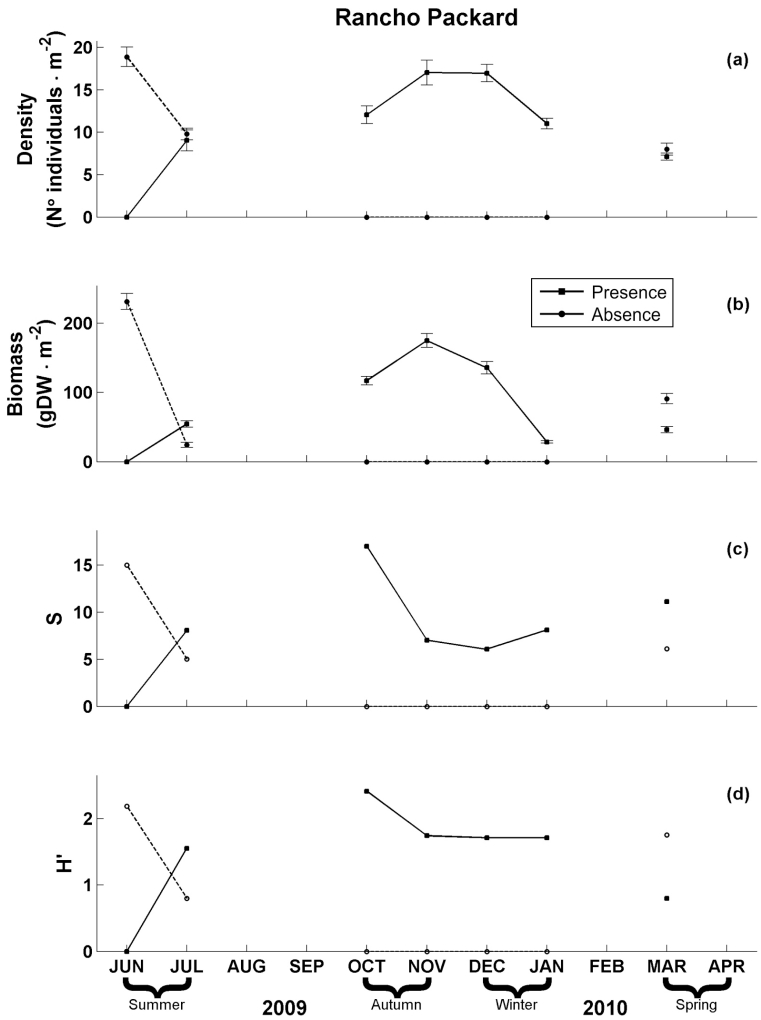

Figure 5. Seasonal variations in the selected structural variables in quadrats with and without *S. horneri* at RP.

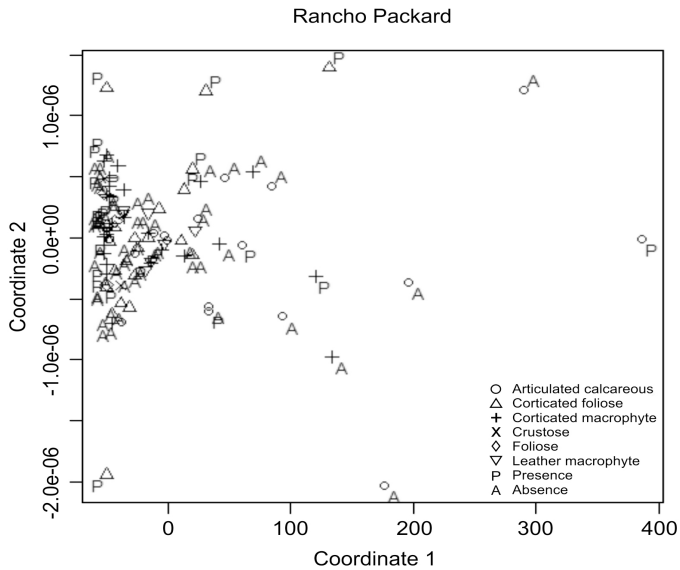

Figure 6. Distribution of the macroalgae functional forms at RP, along the two coordinate principal axes.

4. Discussion

Our results show that there are important site differences in the presence of *S. horneri* inside the Todos Santos bay and its effects on the macroalgae community. At Rincón de Ballenas, the invasive alga was not present all year round, and had low density and biomass values. However, its presence resulted in a significant reduction in the macroalgae density, biomass, species richness and diversity. The corticated macrophytes and the foliose functional forms were severely reduced by the presence of the invasive alga. On the other hand, at Rancho Packard, the presence of *S. horneri* was more continuous throughout the year, and this non-indigenous species reached high density and biomass values. Despite this, there only were marginally significant effects of its presence on the local macroalgae community, and higher density, biomass, and diversity values were found when *S. horneri* was present. Most of the functional forms were represented, even when *S. horneri* was present. Despite these notorious site differences, at both locations, the highest biomass corresponded to the articulated calcareous functional form.

With respect to sites differences, we know that RB is characterized by reduced wave exposure and soft sediment, represented by loose gravel. In contrast, at RP, wave exposure is slightly higher and the substrate is represented by solid rock. Although *S. horneri* has the rare ability to colonize both, hard and soft substrate [10], our data indicate that at the Todos Santos bay, *S. horneri* grows better on hard substrate. This is in agreement with [7], whoat Limfjorden, Denmark, found a strong correlation between the cover of *S. muticum* and the presence of hard substrate. Although we did not find significant differences with depth, [7], found that the difference in cover between shallow, 0 - 2 m, and deep, 2 - 6 m, waters, was regulated by the amount of hard substrate.

Water movement has been considered a seasonally important variable which affects standing biomass, thallus size, morphology and, possibly, fertility [36] [37]. Although we did not made direct measurements of water movement, [29] used numerical simulation models to predict ocean surface waves inside the Todos Santos bay, and results of her study show a higher wave energy at RP, where we found the healthier populations of *S. horneri*. However, in Obama bay, Japan, [38] found that the *S. horneri* populations from the sheltered coast had longer primary laterals, and plants had higher weight, than those from the exposed shore. *In situ* measurements of wave exposure are needed at Todos Santos bay, to determine if our two study sites can be considered to be in a protected shore. For the northern coast of Spain [9], found that wave exposure was not significant for *S. muticum* growth and survivorship. In contrast, [39], for the foliose algae of South Wales, and [37], for the populations of *S. polyceratium* in Curaçao, found that foliose algae were more abundant where wave-action was greater and during the cooler months of the year.

Reference [39] also found that algal survival was greater and growth was faster under conditions of increased moisture, decreased emersion, and decreased temperatures and light regimes during low tide. However, in our study we could not find a significant correlation between *S. horneri* density and biomass with tidal exposure, despite the high number of exposure hours at RP. The fact that *S. horneri* grows at the high intertidal at RP (**Figure 2**), and that at this site exposure hours were greater during spring, could help explain the negative correlation between density and biomass with water temperature and irradiance, in agreement with [39]. The negative correlation between these two biological variables with irradiance could also be due to a high epiphyte load, as found by [40] for three species of *Sargassum* in Hawaii. The negative correlation with water temperature is in agreement with [38] [41] [42], among others, and is characteristic of temperate species.

The ephemeral nature of the individual patches of *S. horneri* at RB, could be understood using the physical and biological arguments that have been presented to explain the colonization and establishment patterns of the genus *Sargassum*: anomalously warm sea water temperatures and their subsequent effects on food web in the region [43]; the disturbance represented by the presence of sand and its negative impact on recruits survival [16]; the unsuitability of smaller stones, gravel and sand, as substrate for grown specimens [7], and highly localized propagule dispersal and settlement [44]. For *Gracillaria verrucosa*, [45] found than an exponential decline in settlement densities and short dispersal distances was partly due to the diffusive environment found in the shallow subtidal.

The strong seasonality that characterizes the genus *Sargassum* has been mainly attributed to sea water temperature, and photoperiod, with regional variations due to latitudinal gradients [43] [46]-[48]. “Autumn-fruiting type” and “spring-fruiting type” populations of *S. horneri* have been described for the Seto Inland Sea, Japan by [47]. For both populations it has been considered that the shortening of day length around the autumn equinox, is the possible cue to start the growth phase, characterized by the rapid increase in thallus length. Simultaneously,

water temperature starts its autumn reduction [47]. However, it is now considered that the difference in seasonality between these two populations does not reflect a phenotypic plasticity, but a genotypic difference [42].

The lifetime of the autumn-fruiting type is considered to have four phases, according to the rates of increase in length and morphogenetic stages: I—formation of early leaves, from December to May; II—differentiation of stems, from May to September; III—rapid elongation of stems and lateral branches, from September to December; IV—senescence phase, after December. In contrast, the spring-fruiting type has two growth phases and a senescence phase: I—from April to September; II—September to March, and III—senescence phase after March [47]. The selected populations of *S. horneri* at Todos Santos bay, corresponds to the spring-fruiting type, like the Japanese populations described by [38], and [47] for the Seto Inland Sea, and the populations of *S. filicinum*, now *S. horneri*, at Long Beach Harbor [19], and the California Channel Islands [49]. The sampled populations in Todos Santos bay show the lowest density and biomass values, when compared to reported values for *S. horneri* (**Table 3**).

When we analyzed the effects of the presence of the invasive alga on the local macroalgae community, we were surprised by the fact that at RB, where *S. horneri* was only present a few months and, showed low density and biomass values, there were significant differences between the macroalgae community structure when *S. horneri* was present versus when it was absent. The presence of the invasive algae resulted in significant reductions in macroalgae density, biomass, S and H'. On the other hand, at RP, where *S. horneri* had a more continuous presence throughout the year, and reached higher density and biomass values, the comparison between the macroalgae community structure under the presence and absence conditions was only marginally significant. The macroalgae showed higher density, biomass, and H' when *S. horneri* was present.

It seems that the macroalgae community at RB was more susceptible to invasion, than the one at RP. To understand the invasion process, it is necessary to analyze the number and identity of the functional groups present [2]. At RB there was a loss of functional diversity, with most of the species belonging to the foliose and corticated macrophytes functional groups being present only when *S. horneri* was absent (**Table 1**), while at RP, most of the species, and functional forms, remained when the non-indigenous alga was present (**Table 2**).

As indicated by [7], during an invasion process, the community structure is affected by the increasing abundance of the invasive alga, and by the changes in the remaining community. After the invasion of *S. muticum* in Limfjorden, Denmark, [7] found that members of the coarsely branched and thick leathery algae tended to decrease consistently over time, as a result of competition. Reference [2] found that canopy species, regardless of their density, suppressed invader biomass, while crustose species promoted invasibility. Turf and subcanopy species effects were similar to those of the canopy species, but less intense [2]. Competitive suppression is mainly due to light competition [17] [51] [52] with space competition becoming important in a later stage [52].

At RB, only two species belonging to the leathery macrophyte functional form (canopy) were present, with most of the corticated macrophytes (subcanopy), and all of the foliose (turf), being gone when *S. horneri* was present. In contrast, at RP, the macroalgae community seems to stand well the presence and abundance of the non-indigenous alga, as most species, and most functional forms remained present, regardless of the presence of *S. horneri*. It is important to note that what we refer to as the local macroalgal community has already being modified, as we found *S. muticum* at both sites. *S. muticum* persist under presence or absence of *S. horneri*, so no competition seems to exist between these two species, but this needs to be assessed in the field.

Table 3. Range of values for abundance, density, and biomass reported for *Sargassum horneri*. Authors are listed chronologically. ND = Not Determined.

Reference	Species	Site	Abundance (No. plants)	Density (No. individuals m^{-2})	Biomass (g DW m^{-2})
[38]	*S. horneri*	Obama Bay, Japan	ND	20	680 (sheltered) 431 (exposed)
[41]	*S. horneri*	Ohori, Corea	15 (October) - 68 (March)	ND	ND
[19]	*S. filicinum*	Santa Catalina Island, CA	>30 (April, exposed) 2 - 4 (April, sheltered)	ND	ND
[50]	*S. horneri*	Gouqui Island, South China Sea	25 (June) - 830 (August)	96 (June) - 3320 (August)	540 (August) 4420 (June)
This study	*S. horneri*	Todos Santos Bay, Mexico	ND	1 (July) - 10 (March)	3 - 78

The already altered macroalgae communities we found inside the Todos Santos bay, are dominated by the articulated calcareous, functional form with the highest biomass at both sites (**Figure 4** and **Figure 6**). This functional form corresponds to what [2] refer to as turf-forming species, which are recognized for being primary space-holders with limited vertical height (usually ~5 cm length). Algal turf has the ability to monopolize space and persist under a wide range of environmental conditions, and its thickness, rather than its cover, seems to be the most affected by the intensity of disturbance and smothering by sediments [53]. The rapid growth of turf-dominated assemblages provides its capability to compete for space and recover from disturbance [54].

5. Conclusion

Our results do not fully support our hypothesis. As in RP, where the highest density and biomass values of *S. horneri* were found, there was not the significant reduction in macroalgae density, biomass, S and H' we expected; on the contrary, density, biomass, and H' showed higher values when the non-indigenous alga was present (**Figure 5**). This unexpected result could be due to the fact that the native community had already been altered by the early invasion of *S. muticum*, with the most resilient species and functional forms remaining in place. One of the most important changes we noticed is the severe reduction of the canopy forming species at both sites, confirming the fact that the local macroalgae community has already been modified, in agreement with [7]. A long-term monitoring, with more study sites, is needed to fully comprehend the changes that the local macroalgae communities are experiencing along the Baja California peninsula.

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[53] Airoldi, L. and Virgilio, M. (1998) Responses of Turf-Forming Algae to Spatial Variations in the Deposition of Sediments. *Marine Ecology Progress Series*, **165**, 271-282. http://dx.doi.org/10.3354/meps165271

[54] Airoldi, L. (1998) Roles of Disturbance, Sediment Stress, and Substratum Retention on Spatial Dominance in Algal Turf. *Ecology*, **79**, 2759-2770. http://dx.doi.org/10.1890/0012-9658(1998)079[2759:RODSSA]2.0.CO;2

From: paul weakland [redacted]
Sent: Saturday, August 15, 2020 7:52 PM
To: FGC <FGC@fgc.ca.gov>
Subject: The Guardian: US allows killing of hundreds of sea lions to save struggling salmon

US allows killing of hundreds of sea lions to save struggling salmon
Permit lets Washington, Oregon, Idaho and Native American tribes kill 540 California sea lions and 176 Steller sea lions

Read in The Guardian: https://apple.news/AwGRNGirASWiWnt6m6Nf9sw

Shared from Apple News

Sent from my iPad

From: Public Interest [redacted]
Sent: Thursday, August 20, 2020 10:39 AM
To: FGC <FGC@fgc.ca.gov>; Miller-Henson, Melissa@FGC <Melissa.Miller-Henson@fgc.ca.gov>
Cc: Wildlife DIRECTOR <DIRECTOR@wildlife.ca.gov>; Lehr, Stafford@Wildlife <Stafford.Lehr@wildlife.ca.gov>; Bess, David@Wildlife <David.Bess@wildlife.ca.gov>
Subject: Public Comment Interpreted as "Repetition"

Greetings President Sklar and Commissioners,

All the work and ever-changing high-tech issues that the FGC deals with are duly noted, and staff's expertise is appreciated—as is the FGC's patience with public participation. However, the FGC must know that with Public Comment, historically a three-minute limit is commonplace. Most citizens prepare comments with that traditional limit in mind.

At yesterday's meeting (Aug 19), at the very last minute (understandable), it was announced that only two minutes would be allowed. To make salient points, we then scramble to delete enough to meet the new timeline without losing context. At today's meeting (Aug 20), anticipating the same, I prepared a two-minute public comment; but at the very last minute, it was changed to one minute, which required rapid edits—again understandable to save meeting time.

Most importantly and my reason for this email: My public comments were not meant to repeat the same information as my comments the day before—which was lethal disease outbreaks. Today, my intent was to add day-and-night—24 hours per day of relentless heat and fire stressors on wildlife. Yes, I was still asking the FGC to take mitigating emergency actions, but evidence and points made today were parts of what I was obliged to cut yesterday (and to some extent today).

We have no control over how our comments are being construed. President Sklar's admonition certainly would have been correct and appropriate had I merely focused on wildlife disease again--repeating yesterday's points. With little time to edit, however, my intended focus was on new, additional stressors with information that I had cut the day before.

I take responsibility for unskillful last-second edits that may have been time-consuming and viewed as repetitious. As an aside, other critical wildlife stressors were also deleted (including but not limited to critical bat issues, plague being contracted in El Dorado County, and more).

Please keep conservation, protection and preservation of wildlife and its habitat at the top of FGC's priorities and not allow human pleasures, recreation, or other activities take precedence.

Thank you for your work,

Marilyn Jasper, Chair
Public Interest Coalition

PS: CDFW reports at today's meeting were greatly appreciated.

From: Carissa Pastor [redacted]
Sent: Tuesday, September 1, 2020 1:36 PM
To: FGC <FGC@fgc.ca.gov>
Subject: Please help, we are desperate!

To those that have pets, they are everything to us. We would do anything to protect and keep them safe.
Unfortunately, coyotes all over Torrance are destroying lives every single day for years!! We do our best to keep them safe and keep them inside, but the amount of these wild animals causing havoc and death is absolutely ridiculous.

All in South Torrance-

My 1 year old cat, Looners was taken off our property 3 years ago by a coyote. He didn't stand a chance. Innocent, precious life robbed from us.

Last year, our 12 year old cat was siting on our sidewalk in the early evening, in a matter of seconds my dad witnessed her being grabbed by her neck and taken away! My dad then bolted out of the house and chased the coyote down the street until it eventually dropped her and took off. Myers, our cat had blood dripping out of her ears and mouth. Shaking and panting. She was never the same. Lost a ton of a weight and was in constant fear until, last weekend she went outside to use the bathroom and sure enough the coyotes came back to truly end her life for good. A terrible, gruesome death we now have to live with.

We are all traumatized and in such disbelief that the city is continuing to let these deadly animals run our streets. Year after year. I took the time to share me and my families story for hope and a chance for change. Please, help save our pets lives and also allow us to be content in our community.

Thank you and we'll continue our prayers for change.

--
Best regards,
Carissa

From: Mary Mote [redacted]
Sent: Tuesday, September 1, 2020 1:43 PM
To: FGC <FGC@fgc.ca.gov>
Subject: Fwd: My kitty, Tubby

Coyotes
This is a letter I sent to a lawyer hoping he could help with the coyotes terrorizing our neighborhood. It is years later and the city has done nothing and many many more well loved pets have been destroyed by a wild animal that should not be allowed to kill our pets.. Please help us, it has gone on way too long and so much heartbreak has occured. Thank you, Mary Mote [redacted]

---------- Forwarded message ---------
From: **Mary Mote** [redacted]
Date: Sat, Jul 22, 2017 at 6:17 PM
Subject: My kitty, Tubby
To: <[redacted]

Dear Mr. Brady,

I think Theresa Hew has told you I would be writing and introducing myself. My name is Mary Mote and I live at [redacted], and the early morning of July 14, 2017, my dear 17 year old cat, Tubby was destroyed by coyotes.

I have lived in this house since 1977, have always had cats, which have always been allowed out into their own fenced back yard. I have a cat door, so they can come and go. The early morning in question, I heard Tubby go out around 4 and when I got up at 7, she was not on the patio where she usually was waiting for me to get up and she would come in for breakfast. I waited all day and she did not arrive, and I saw my next door neighbor and asked him had he seen any coyotes lately and he asked me why and I told him I couldn't find Tubby. And that's when he told me he saw a destroyed cat on a neighbors parkway that morning when walking his dog. I asked it it had white fur and he said he thought so, but it was torn up badly. He said he didn't know I had a cat with white fur and I told him that is because he never saw her, she was either in, or in the back yard. I immediately knew it had to be Tubby.. I was devastated. I have had her since she was a teeny tiny kitten, she has been such a very dear cat, she has never hurt anyone and to have her die so horribly is more than I can bear.. The neighbor whose parkway her remains were on told Theresa he had disposed of them so children

wouldn't see them, so I never even got to see her again, but only have a piece of her fur...so very sad..

I hold the city of Long Beach responsible, they have been so negligent with coyote management, if using any management at all.. family pets are being killed daily and nothing is done about it. The city blames the victims and the owners (me) but not the habituated coyotes that live here and prey on our family pets daily..

I did everything right for my kitty. Got her fixed, got her shots, got her her rabies shot (required by the city) got a licence (also required) have a fenced back yard, and still she was brutally killed by a coyote or coyotes that the city allows to roam neighborhoods day and night. I have been so upset since my Tubby has been gone, and I am nervous and anxious daily, worrying about my other two cats (Boy and Sniff) and a feral that comes nightly that I feed, that it is hard to even sleep.

I am 84 and on oxygen 24/7 and my cats mean so much to me, (as I am sure each pet that has been killed and eaten by these coyotes mean to other families that have lost pets)

I hold the city wholly responsible for the anguish and horror I have experienced, and if you have loved a pet and had it killed so brutally, I think you know what I mean.

I am a cit zen of this city, I have lived in Long Beach since the early 60's and I expected the people I supported and voted for to keep me and mine safe. I pay property taxes and am a good citizen, but it seems Long Beach does not care about that. They have been bought and paid for by PETA (who kill more domestic pets than the SPCA) and Project Coyote, and they have decided I and my pets are dispensable as long as they don't make waves with PETA or Project Coyote. Well I am sick and tired of being a second class citizen and I hold Long Beach responsible for my loss and sorrow and expect them to do something about it.

Thank you. I have enclosed a picture of my Tubby, you can see how beautiful and sweet she was, and I miss her terribly.. 17 years she loved me and I loved her and now she is gone. Poor little girl didn't deserve a fate that could have been avoided....so very sad

Thank you for listening...

Mary Mote
[redacted]

From: Harvey Sherback [redacted]
Sent: Wednesday, September 2, 2020 9:56 AM
To: FGC <FGC@fgc.ca.gov>
Cc: Miller-Henson, Melissa@FGC <Melissa.Miller-Henson@fgc.ca.gov>; Yaun, Michael@FGC <Michael.Yaun@fgc.ca.gov>; Snellstrom, Jon@FGC <Jon.Snellstrom@fgc.ca.gov>; Fonbuena, Sherrie@FGC <Sherrie.Fonbuena@fgc.ca.gov>; Ashcraft, Susan@FGC <Susan.Ashcraft@fgc.ca.gov>; Cornman, Ari@FGC <Ari.Cornman@FGC.ca.gov>
Subject: Re: A Viable Photovoltaic Alternative To Save The Western Portion Of The Joshua Tree National Park

California Fish and Game Commission
CFGC Commissioners & Staff Members
Eric Sklar
President

September 2nd, 2020

Hello President Sklar, California Fish and Game Commissioners & Staff Members,

I want to thank all of you for your many efforts to create a better, more sustainable world for us, our children and future generations. Here for your perusal and consideration is a viable solar electric alternative to help save the beautiful plants, trees and wonderful wildlife that flourish in the western portion of our more-than-precious Joshua Tree National Park.

Because the people of California, including our farmers and ranchers, care for both the land and environment on which we all depend, they have placed a high priority on the development of clean renewable energy as well as improved efficiency of water use. Now is the perfect time for a comprehensive overhaul of California's energy and water infrastructure to ensure a thriving and enduring way of life.

Introducing Photovoltaic Canal Covers To Conserve California's Fresh Water Resources.

With almost 40 million people, the growing population of the Golden State consumes more and more water every year. The canal systems that we depend on are at risk. Water officials throughout the state have said the 1,100 miles of levees in the delta are increasingly vulnerable to earthquakes, flooding and saltwater intrusion. Everyone agrees, we can't keep doing what we're doing now.

California’s prosperity depends on water. The ever-growing demand has resulted in continuously rising water prices. We have transformed water from a resource into a commodity. Increasingly, we are witnessing furious political competition for better prices and favored access to California’s future supplies. Unless we sensibly change the way we distribute, consume and conserve our most precious resource, we will observe the decline and fall of one of the world's greatest agricultural zones.

California can improve its water system in a way that pays for itself. The following is a multi-purpose model: shading selected portions of California's canal infrastructure with photovoltaic generators that will create new income and help enhance our endangered water system. Depending on location and the

developer's resources, these electricity-generating structures might span the canal like a canopy, shade the canal like an awning or float on the canal like a barge. The reasons I recommend money-generating, water-saving, photovoltaic canal shields are listed below:

Perfect Location: California's canal system is situated on secure public property, mostly federally-controlled, and the canals run for hundreds of miles through desert-like conditions, which is ideal for the development of solar power.

As you know, our canal system adjoins major high-voltage transmission line corridors. More than just increasing efficiency, producing photovoltaic power near the grid benefits our utility companies. They must fulfill California's strict renewable energy mandate, the Renewable Portfolio Standard (RPS), which requires these utilities to procure over half of their electricity sales from renewable sources by 2030 with an electricity sector planning target of 100 percent renewable and zero emissions by 2045. By law, most of this new power must connect to the grid.

Conserving Water: By blocking the sunlight that normally falls on the canal and heats the water, a photovoltaic shield helps keep the water cool and free from vegetation. Covered canal sections would be immune to blooms of toxic algae. In addition to slowing evaporation, the electricity-generating shield will protect the canal water from absorbing agricultural chemicals and airborne pollutants like soot, soil, sand.

Ideal Timing: Our continued prosperity depends on our canal system's ability to transport usable water away from the Delta, but according to the US Interior Department, the California Aqueduct system is antiquated and dangerously vulnerable to drought, flood and earthquake emergencies. Our canal system needs immediate attention and overhaul. California has already thought of this. In 2005, California approved the leasing of the space above and adjacent to the State Water Project for the production of photovoltaic electricity (AB 515, Richman R, signed by Gov. Schwarzenegger).

Photovoltaic Power: America's coal-fired, oil-fired, natural gas and nuclear power plants consume billions of gallons of fresh water every day. Only agriculture uses more water. Once manufactured and installed, solar panels emit no greenhouse gasses, use no water, have no moving parts, make no noise, are virtually maintenance free, except for an occasional cleaning, and are easily recycled. Furthermore photovoltaic panels won't suffer the potential of a catastrophic Fukushima-like nuclear meltdown over their estimated 20-25 year warranted lifetime.

Calculating the true cost of electrical generation, factoring in the value of the water consumed and the emissions avoided, both now and in the future, it's easy to conclude that water-saving photovoltaic technology will promote a safer and more prosperous infrastructure for future generations.

California's Energy Storage Procurement Mandate: California has adopted an ambitious energy storage procurement mandate for investor owned utilities to install 1,325 MW of storage before 2024 to provide long-term demand and security to the growing energy storage market. This new energy storage mandate would dovetail with the development of California's Solar Powered Aqueduct System.

Another of the many possible uses for this photovoltaic generated electricity is to help power California's new High Speed Rail System that will be running through the Central Valley.

The Photovoltaic Canal project will help California's utilities meet the RPS mandate to purchase grid-

connected renewable electricity, while creating lease income for governments and long-term profits for developers. More electricity also means lower prices for consumers. Most important, the Photovoltaic Canal is a model designed to improve our vital and endangered water system; it's simple, scalable, low-risk and low-cost. By initiating the Photovoltaic Canal project, California could advance the development of money-making, water-saving, clean-energy technologies that are needed everywhere on Earth.

It's time to get Star-Powered...Let's get Solar!

Harvey Sherback
Berkeley, California

Additional Information:

Renewables Portfolio Standard Progress Report

https://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf

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Evaporation: An Analysis Of The California State Water Project's Efficiency

http://watermanagement.ucdavis.edu/files/4114/3891/2385/A01_Burt_Good_Shachar_Pascual_ESM121_FinalReport.pdf

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YouTube: Video Visit To World's First Canal Top Solar Power Plant In Gujarat With SunEdison Official

https://www.youtube.com/watch?v=DZvjOnNzFD0

How California Is Driving The Energy Storage Market Through State Legislation

https://www.theclimategroup.org/sites/default/files/downloads/etp_californiacasestudy_apr2017.pdf

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August 7, 2020 - California High-Speed Rail Authority Advances Environmental Work in Central Valley

https://hsr.ca.gov/communication/news_room/news_releases/?id=54

Cc: The Center for Biological Diversity
Public Lands Program Staff
Ileene Anderson

Public Lands Deserts Director, Senior Scientist

Eric Sklar - President 08/31/20

I am 86 (09-17-20) & have had a fishing licence since age 16. (70 YRS) —

I have questions & concerns:

1. licence fees - I can't go all year
   × lifetime? @ 86 why would I go there? $562.25
   × 2 day - $25.00? for year or consecutive days
   × 70 " - $51.02 (same as year - what's the point?)

* 2. APR 15 '15 told I had cancer & I've fished little - to none since yet - I've bought a licence. I'm look'n to fish some if my son or grandson will take me! Consider elders two ailments & can't go much during year

3. I have a sturgeon landing pole (see sketch) see my letter to Cpt David Bess. - I showed it to local (Martinez) warden & he "thought it might be OK". I'm using it & hope warden that stops me will concur. I told local warden the sturgeon I caught could not get in my net (-36") & after 5 attempts I hand grabed it with it's gills - he said No yet book says I can't. ? Pole loop is better.

* 2. I'm hoping to get a few more years in fish'n w/ my son & grandson - the fees in my retirement income are becoming expensive. Cancer & age are a problem yet I still have the urge to fish

Blaine L Bonadei

Sturgeon

Captain David Bess 02-01-13

I find the new sturgeon rules, still, very difficult to understand ! I have the flyer on the size & measuring plus the questions & answers from/to Capt. Steve Talmadge & David Bess.

By paragraphs:

#3 – the sketch A, attached, is a landing pole that is on the market that "snug" over the small area near the tail, locks in position so the loop does **not** tighten when landing (haul in boat) the fish into boat to measure for keep or release. BUT – you then say in the last 11 words "and the fish is kept in the water to release". I may wish to keep the one allowed. If the fish is very near 40" or 60", how does one measure a wiggling fish while leaning over a deep rail with one hand on the pole & the other second & *third* hand on a tape ? This can be risky when fishing alone I will try landing a near legal (40 to 60) fish with a net and a cotton yard glove holding the fish near the tail, landing it, measuring & keep or release. There are no comments on landing with a hand into the gills. I would not do this but some might.

#15 – your response "It will depend on what the angler says to the warden --------" makes one nervous.

The DF&G regulation 2.09 says one cannot use a net exceeding 36" in **greatest dimensions**. If you want anglers to use net on sturgeon, why 36". A net over 36" deep is illegal ?

On another issue, a warden came to the Martinez bait shop and told the usual retired fishers that hang out there that flounders were illegal east of the Carquinez Bridge (highway 80). My telcon to your Napa office cleared that matter as not true. I received great courteous return call response there from Eric, Tiffany & James. The arrow falls under the ocean rules & the starry falls under the fresh water rules. There are no colored photos of each in the ocean pages. I understand that starry's have no size & quantity limit. Would starry be under ocean rules west of the bridge (highway 80).

rule changed OK 08/31/20

Blaine Bonacci [redacted] --- Iv'e fished for over 64 years in CA
E-mail – [redacted] – cell – [redacted] from 08:00 to 05:00 – house [redacted]

Blaine Bonacci

JAN 13/13
08:30 — Eric Brian } [redacted]
09:00 — & Tiffany }
05:45 — James [redacted]

askbdr@dfg.ca.gov

The following questions and answers were submitted by Captain Steve Talmadge, Flash Sport Fishing to David Bess, Captain, Law Enforcement Division, California Department of Fish and Wildlife to clarify the new sturgeon regulations effective 1/1/13. David Bess verbally agreed with the answers as listed below with the exception of question #1. After further review, he emailed additional text to add to answers as listed to questions 1, 2 and 5 (** paragraphs are David's insertions).

1) *Can anglers use a non-locking snare when their intent is to catch and release sturgeon?* This way, anglers can keep the sturgeon in the water instead of using a net to land them onto a boat (to avoid damaging fins when using the net). Per the new **Method of Take** regulation "...nor shall any person use any type of firearm <u>or snare</u> to assist in landing or killing..." (CCR, Title 14, Sec. 5.80 and 27.90) As the angler has no intent to land or kill the sturgeon, it appears use of a snare is not prohibited when releasing a sturgeon in the water. My goal is to teach anglers attending the seminar how to release sturgeon safely. Based on my many years of experience catching & releasing sturgeon, non-locking snares cause much less damage to sturgeon than netting when keeping the sturgeon in the water.

   * Answer: A loop may be used on a sturgeon when the angler intends to land or release the sturgeon, when the loop is locked into position (so that it cannot tighten on the fish) and the fish is kept in the water for the release.

   Cpt Bess

   Show to measure

   ** The intent of the regulation was to stop the use of snares in the taking of sturgeon. If a snare is used it can be viewed as a violation and a warden may cite that individual.

2) *Do children (under 16 years of age) need to purchase a sturgeon report card when they are not targeting sturgeon specifically?*

   * Answer: No, children do not need to have a sturgeon report card if they are not targeting sturgeon.

picked up at Martin's Bait Shop week of 1/25/13

** If a child catches and retains a sturgeon they must possess a sturgeon report card and follow the tagging requirements, even if the catch was not targeted.

3) *If some anglers on the boat want to target sturgeon, and some don't, do all anglers on the boat have to purchase a sturgeon report card?*

* Answer: No. Per email from Stafford Lehr, Chief, Fisheries Branch at California Department of Fish and Game; 01/11/13 7:57 AM

> "If the angler is actively fishing for sturgeon they need a report card. If an angler chooses to keep a sturgeon when they are fishing for another species they would need a report card. Anglers not falling into those two categories do not need a report card."

4) *If some anglers on the boat are targeting bass, and others targeting sturgeon, can the anglers targeting bass use barbed hooks while the others use barbless for sturgeon?*

* Answer: Yes, anglers NOT targeting sturgeon may use a barbed hook. And, as posted by Marty Gingras, Supervising Biologist at California Department of Fish and Game, to the Coastside Fishing Club Forum at http://forums.coastsidefishingclub.com

> "If a sturgeon is taken legally with barbless hook and then boated and tagged, the fisherman may then fish for stripers with a barbed hook while a sturgeon is on board."
> *Posted on 01-12-2013, 08:14 AM*

5) *When an angler with a 2-rod stamp is targeting both bass and sturgeon at the same time, will they be allowed to have a barbless hook on one rod and a barbed hook on the other?*

*** In the scenario given above, if the angler states to the warden that he/she is using the barbless hook pole for sturgeon and the barbed hook pole for bass, that would NOT be a violation. I spoke to Marty Gingras about this today. It will depend on what the angler says to the warden when questioned about what they are fishing for and how they articulate which pole/hook set up is being used for what. If the angler catches a sturgeon on the barbed hook set up of course they would have to release it as it WOULD be a violation to keep a sturgeon taken with illegal gear in relation to that species.*

6) *Please clarify the fishing requirements for pier fishing – how do anglers legally catch and release a sturgeon when pier fishing?*

   * Answer: It is up to the angler to determine how to legally land or release sturgeon from a pier without using a snare.

7) *Is there a hook restriction size when fishing for sturgeon?*

   * Answer: No change to regulations. Refer to Freshwater Section 2.10 Hook & Weight Restrictions.

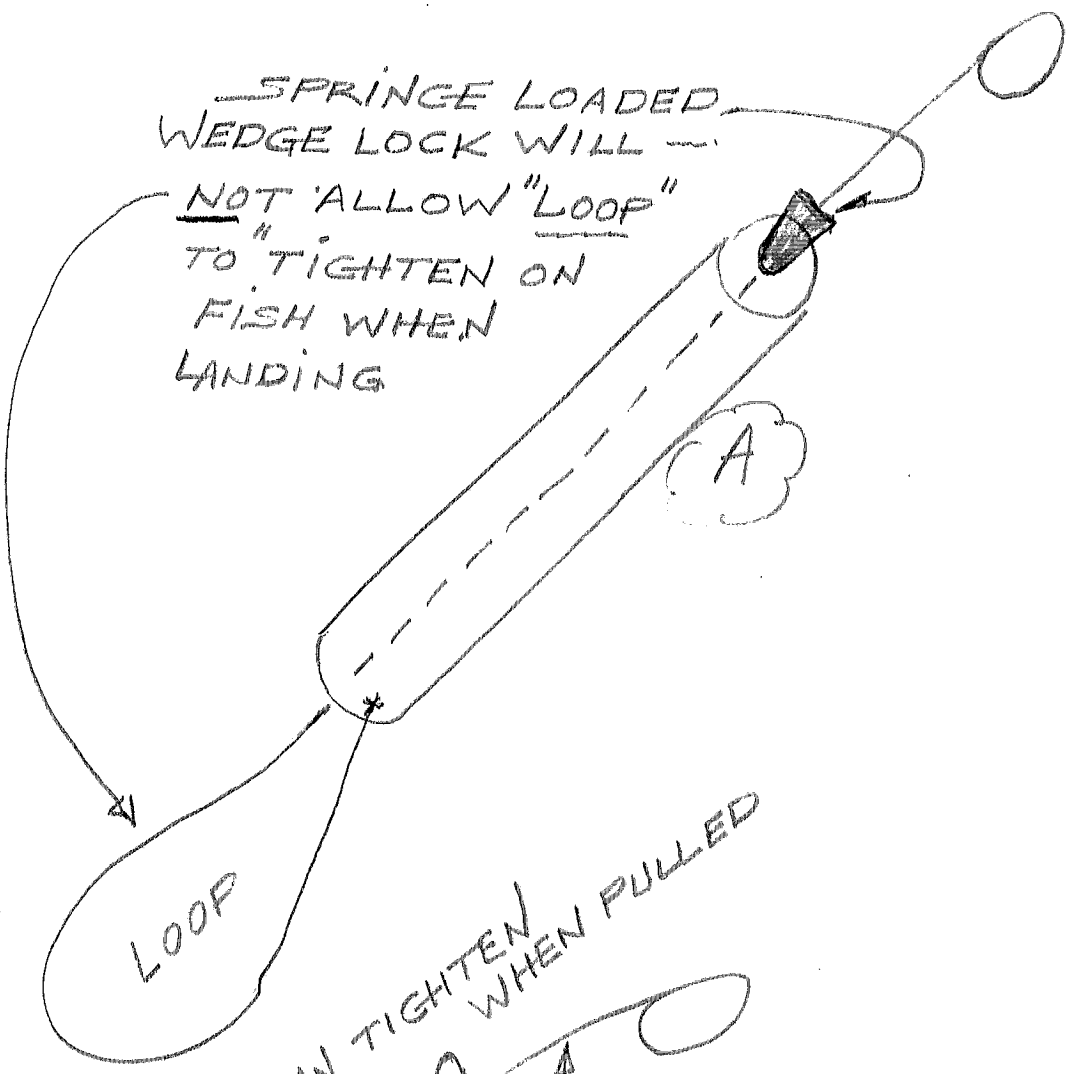
Captain Steve Talmadge
Flash Sport Fishing

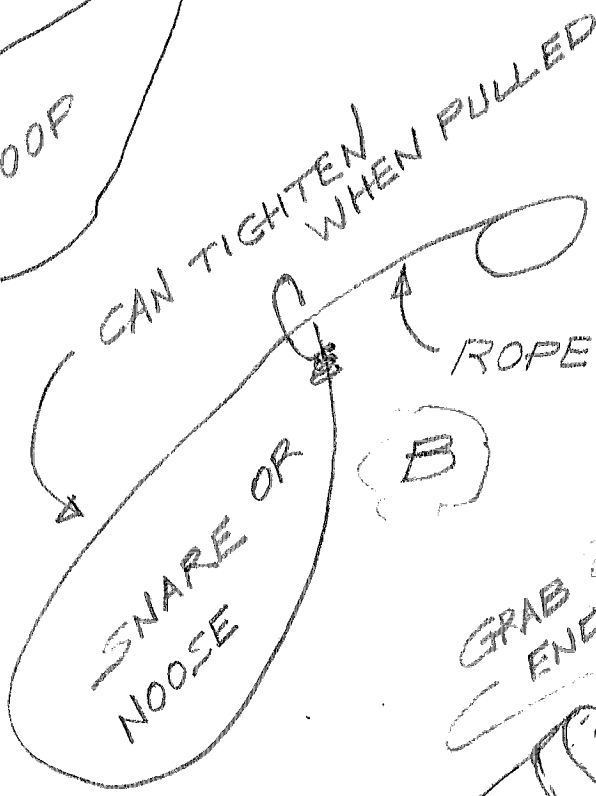
Captain David Bess
Law Enforcement Division
California Department of
Fish and Wildlife

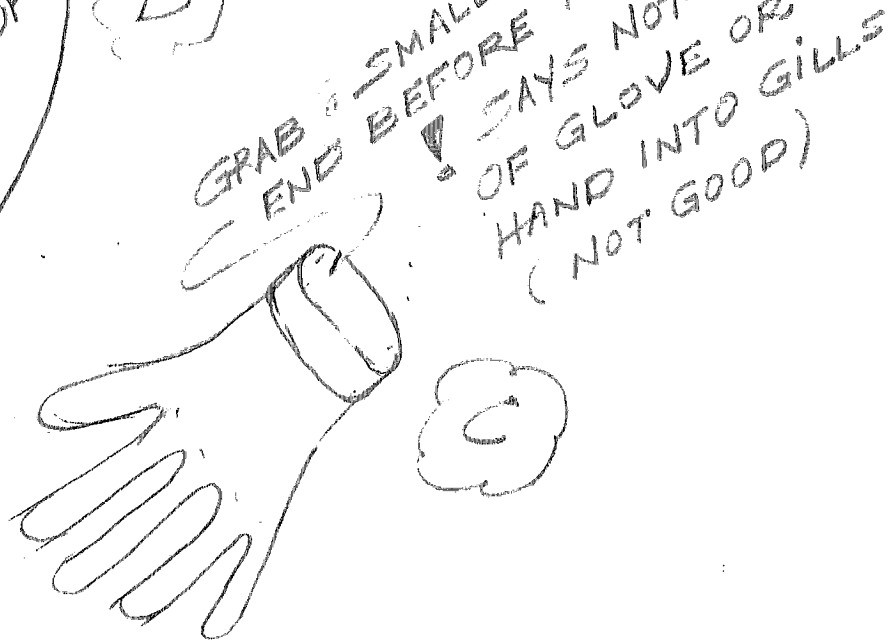
* Answers submitted for review to David Bess, Captain, Law Enforcement Division, California Department of Fish and Wildlife.

** Insertions as received from David Bess, Captain, Law Enforcement Division, California Department of Fish and Wildlife via email to Steve Talmadge on 1/24/13.

B Bonacci
02-01-13







Using a Snare

Where can I view the Department of Fish and Wildlife's definition of "Landing"? I tried to find one on the Department of Fish and Wildlife website and was unsuccessful. The only definitions of "landing" I have been able to find related to fishing are from dictionaries and they define "landing" as:

1) verb "Angling. to bring (a fish) to land, or into a boat, etc., as with a hook or a net."

2) noun "an instance of coming or bringing something to land, either from the air or from water"

I could not find a regulation prohibiting anglers from using a snare when "restraining" sturgeon - such as when catching and releasing sturgeon in the water, never "landing" them. I will continue to pursue more discussions on this with Fish and Wildlife staff in the future, as I believe a loop (non-locking snare) is more beneficial to the sturgeon than actually landing the fish with a net or using a net to restrain a fish in water when releasing. I believe there is no clear legal language available at this time.

Per Webster's dictionary,

Landing
an instance of coming or bringing something to land, either from the air or from water

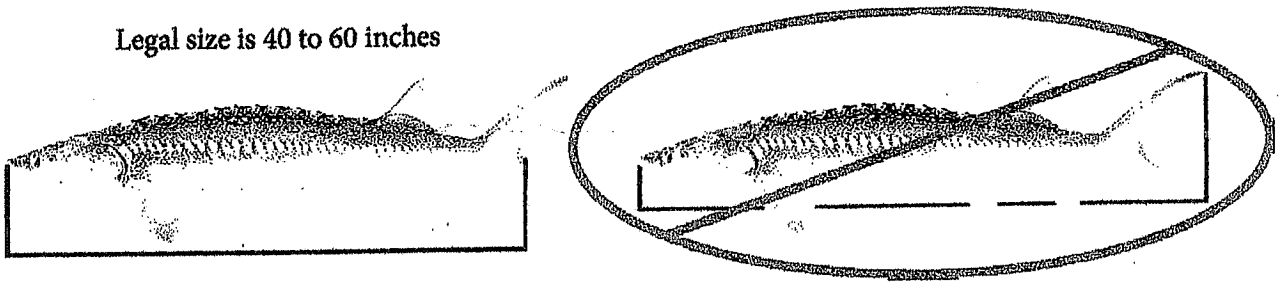
Snare
a trap for catching birds or animals, typically one having a noose of wire or cord.

Noose
a loop with a running knot, tightening as the rope or wire is pulled and typically used to hang people or trap animals.

New Sturgeon Regulations Effective Jan. 1, 2013

To protect threatened green sturgeon while allowing sturgeon fishing to continue in California waters, the Department of Fish and Game has new regulations for sturgeon anglers effective Jan. 1, 2013. Please note the following changes.

Legal size is 40 to 60 inches



New measurement method (fork length)

Old measurement method (total length)
Not legal in 2013

Size limit

Anglers may take or possess any legally caught white sturgeon between 40 and 60 inches. The fish must be measured from the nose to the tail fork. (California Code of Regulations, Title 14, Section 5.80 and 27.90)

Methods of take

pole
chase
a loop

Only one single barbless hook may be used on a line when taking sturgeon. Use of a snare to assist in landing or killing any sturgeon is prohibited. A snare is a flexible loop made from any material that can be tightened like a noose around any part of the fish (CCR, Title 14, Sec. 5.80 and 27.90)

Removal from water

Any white sturgeon greater than 68 inches fork length ***may not be removed*** from the water and shall be released immediately. (CCR, Title 14, Sec. 5.80 and 27.90)

Green sturgeon may not be removed from the water and shall be released immediately. (CCR Title 14 Sections 5.81)

Season and regulation changes

It is unlawful to take any sturgeon from the Sacramento River between Keswick Dam to the Highway 162 Bridge in Shasta, Tehama and Glenn counties. (CCR, Title 14, Sec. 5.80, 5.81)

Sturgeon report cards

2013 Sturgeon Fishing Report Card Permit Fees are $7.50, plus a 3 percent ALDS application fee and a 5 percent license agent fee, where applicable. (CCR, Title 14, Sec. 701)

From: afa@mcn.org <afa@mcn.org>
Sent: Friday, September 4, 2020 1:17 PM
To: Office of the Secretary CNRA <secretary@resources.ca.gov>; FGC <FGC@fgc.ca.gov>; Wildlife DIRECTOR <DIRECTOR@wildlife.ca.gov>; Cornman, Ari@FGC <Ari.Cornman@FGC.ca.gov>
Subject: [Fwd: ON HUNTING: "FIELD TO FORK" - ORION MAGAZINE, AUTUMN 2020]

Warning: This email originated from outside of CDFW and should be treated with extra caution.

FYI -
x
Eric Mills, coordinator
ACTION FOR ANIMALS
Oakland

---------- Original Message ----------
Subject: ON HUNTING: "FIELD TO FORK" - ORION MAGAZINE, AUTUMN 2020
From: afa@mcn.org
Date: Fri, September 4, 2020 1:10 pm
To: afa@mcn.org

From ORION MAGAZINE, Autumn 2020 - SEE ENCLOSED LINK.

FOOD FOR THOUGHT: "Field to Fork: What the end of hunting as we know it means for conservation--and for our diet."

This issue of ORION also contains a joint interview with Jane Goodall and Krista Tippet, "The Shadow of Humanity and the Spirit of Animals."

SUBSCRIPTIONS HIGHLY RECOMMENDED! ORION MAGAZINE (a quarterly) is one of the very best things out there, IMO: wonderful nature writing, photography, art, poetry, and more. And no advertising. A perfect Holiday gift....

Letters to editor email -

x
Eric Mills, coordinator
ACTION FOR ANIMALS
Oakland

M-F: 11am - 5pm
Sat-Sunday: CLOSED
****
*Piedmont Copy & Printing | [redacted]
HOURS: M - F: 9am - 7pm *|* Sat: 10am - 5pm Sun:
CLOSED

From: Konstantin Karpov [redacted]
Sent: Friday, September 11, 2020 3:23 PM
To: FGC <FGC@fgc.ca.gov>
Subject: Fwd: Oral comments regarding abalone closure extension on Sept 14 meeting - Susan Ashcroft

Begin forwarded message:

From: Konstantin Karpov [redacted]
Subject: Oral comments on Sept 14 meeting - Susan Ashcroft
Date: 11 September 2020, 15:17:19 PDT
To: FGC@dfg.ca.gov

Honorable Commission staff

I wish to comment during the upcoming meeting on Sept 14. My comments will be limited to 3 minutes.

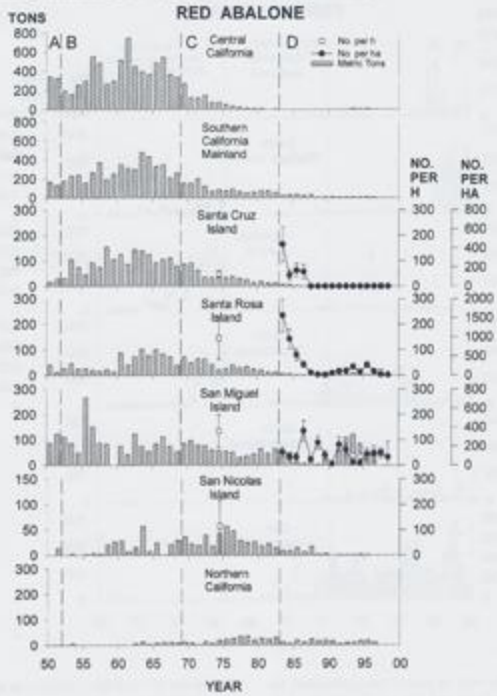
Sincerely Konstantin Karpov

PS
Could I possibly have you include the following image for my comments.
Figures 1 and 2 from my letter to the MRC on July 27. And my figure below that is in the ARMP and here extracted from our serial depletion paper.

Only if it is not too much trouble.
Fig. 1 CDFW Abalone density and 95% CI at Northern California Index sites. Slope of decline is average of all sites sampled 2010 to 2018.
Fig. 2 *The ARMPs foremost aim to recover abalone*

And this Figure 4 from serial depletion paper.

Fig. 4. Red abalone catch (metric tons, bars), density (number per hectare, solid dots), and number per hour (open squares) from northern, central, and southern California mainland, and four Channel Islands. Catch is divided by landing periods. Catch areas are ordered from top to bottom by accessibility to fishery. Vertical lines around points are SE.



(1942–1996). Examination of combined abalone landings revealed four distinct phases in the fishery. There was a building phase (Period A), in which landings steadily increased presumably during the initial exploitation phase of the fishery. Increases in landings can occur as new areas are opened to exploitation in spatially complex fisheries (Orensanz et al. 1998) or as accumulations of old and (or) large individuals are utilized (Francis 1986). As the fishery matured, it appeared to remain stable for almost two decades (Period B), however, combined landings masked the replacement of declining pink abalone with red abalone. The fishery began a period of sharp decline in 1969 (Period C), in which a series of species were sequentially depleted. The reoccupation of central California by the southern sea otter in the 1960s decimated red abalone populations in that area and consequently commercial fishery landings (Wendell 1995). The decline in the combined landings appeared to slow as landings reached low levels (Period D); however, an examination of catch data during this period revealed a pattern of serial depletion by fishing area. Fishery independent data corroborated these declines in the fishing areas.

The one exception to this pattern of dramatic decline has been the recreational fishery for red abalone in northern California. North of San Francisco, abalone may not be taken using SCUBA or surface supplied air. This regulation results in a *de facto* reserve at depths beyond 8.5 m (Karpov et al. 1998). This has resulted in a large-scale spatial harvest refugia for the deeper portions of the population. Walters, as cited in Orensanz et al. (1998), suggested that sustainable fisheries result from spatial accidents which protect a large

To: Marine Resources Council of the California Fish and Game Commission
From: Konstantin Karpov
Re: Proposed Red Abalone Fishery Management Plan
Date: July 27, 2020

Dear Marine Resources Council members:

I am writing with regards to the Red Abalone Fishery Management Plan currently under your consideration. As a career fisheries scientist, I bring a critical long-term perspective to the challenge of managing this unique shellfish. I worked for the Department from 1979 to 2009, with a focus on abalone. I am the author of 10 peer reviewed papers on abalone, along with other highly respected abalone scientists. I attended several international conferences on abalone science, I was a co-author of the Department's 2005 Abalone Recovery and Management Plan, and in 2007 I was awarded one the CDFW's highest honors, the Francis Clark Award, given to a staff member who exemplifies scientific excellence and dedication to conservation, as so famously demonstrated by Dr. Clark who fended off commercial interests intent on liquidating California's sardines in the 1930s.

Beyond these professional qualifications, and perhaps most important, I personally have witnessed the Department fail to foresee critical tipping points in time to avert serious declines of abalone, and I fear we are at a similar juncture now with red abalone. Already the rest of California's abalone species are either federally "endangered" or "species of concern." I believe it should now be the Department's highest goal to keep red abalone from becoming part of the Sixth Extinction.

For these reasons, I have some concerns about the current proposed Red Abalone Fishery Management Plan (FMP) and want to offer crucial perspective and constructive comments.

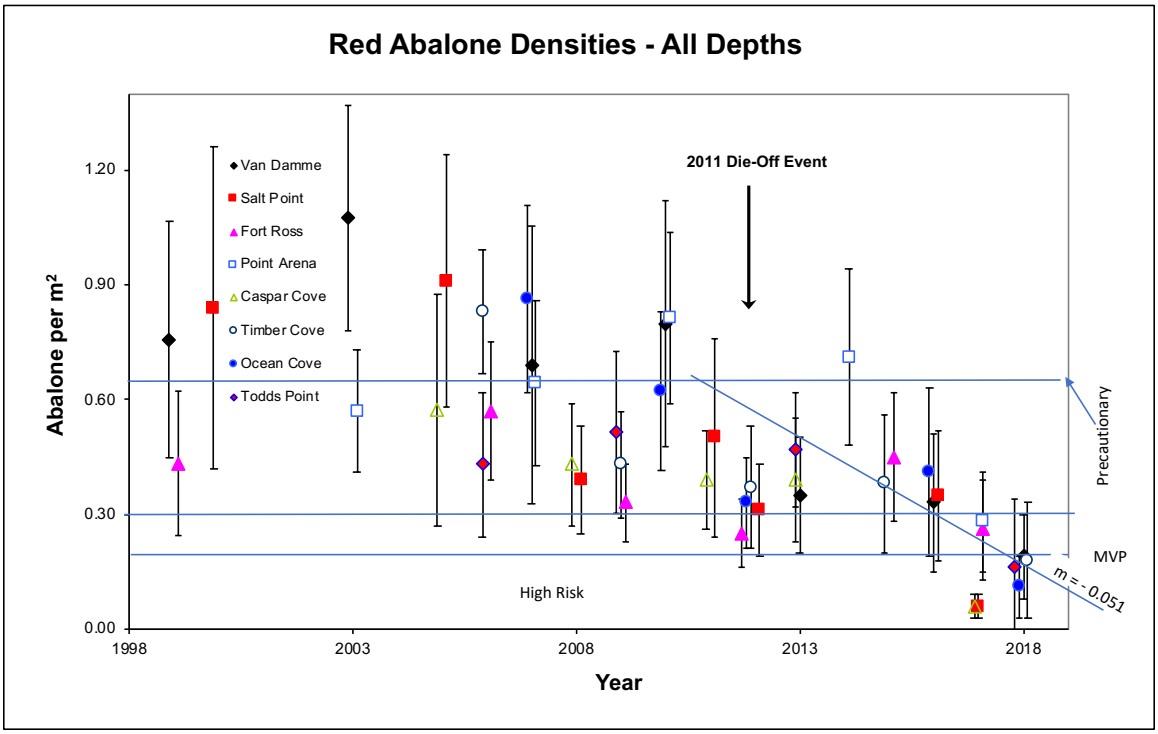
It is important to remember that the Commission first directed the Department to proceed with this FMP before the "Perfect Storm" hit northern California's kelp forests/ reefs. At that time, it was believed that red abalone could be sustainably fished, in part owing to a large deepwater broodstock refuge and a red urchin fishery that reduced food competition for red abalone (Karpov et al., 1998).

However, now, the situation is entirely different. In the wake of the "Perfect Storm," (as described by Dr. Cynthia Catton: https://www.youtube.com/watch?v=P42Gm1AiWQw) red abalone stocks have been reduced to a small fraction of their former abundance. Abalone's primary food source, bull kelp, has been reduced by 95%. With purple urchins dominating all the deepwater habitat, red abalone are now restricted solely to narrow bands of shallow, nearshore habitat, where they remain extremely highly vulnerable both to starvation and to predation by cabezon, crabs, and even octopi. The situation for northern California's red abalone is now as perilous as that in southern California.

In the 1990s, I was part of the team of CDFG biologists that conducted surveys for red abalone on reefs off Santa Rosa Island in southern California. In the course of just a few years, we watched as formerly abundant sites were significantly reduced, literally to zero by 1993. These reefs remain to this day barren of any red abalone broodstock.

To me, it appears we are now in a very similar situation in northern California. Consider the trend in recent survey data, which shows steeply dropping populations, with a slope potentially reaching zero red abalone in just 4 years (Fig. 1).

Fig. 1 CDFW Abalone density and 95% CI at Northern California Index sites. Slope of decline is average of all sites sampled 2010 to 2018



Instead of preparing and implementing a costly FMP, the Commission should direct the Department to focusing resources on the project of red abalone restoration and recovery in both southern and in northern California.

Already, the Department spent more than $1 million (of mostly sport fishery fee monies) through the San Miguel Island fishery consideration process to explore opening a commercial fishery targeting the small number of remaining animals for the benefit of just a small number of commercial abalone fishermen. I don't know how much money has been spent to develop this Red Abalone FMP for a species that is, in all honesty, now on track toward extirpation throughout the state.

Instead of adopting a FISHERY management plan, even for a so-called de minimis or "trophy hunt" fishery, the Commission should now be directing the Department to

redouble its efforts toward restoration and recovery of red abalone throughout California.

Here are 3 items that I think the MRC needs to carefully consider to keep the CDFW on the right course with regards to sustaining red abalone into the future:

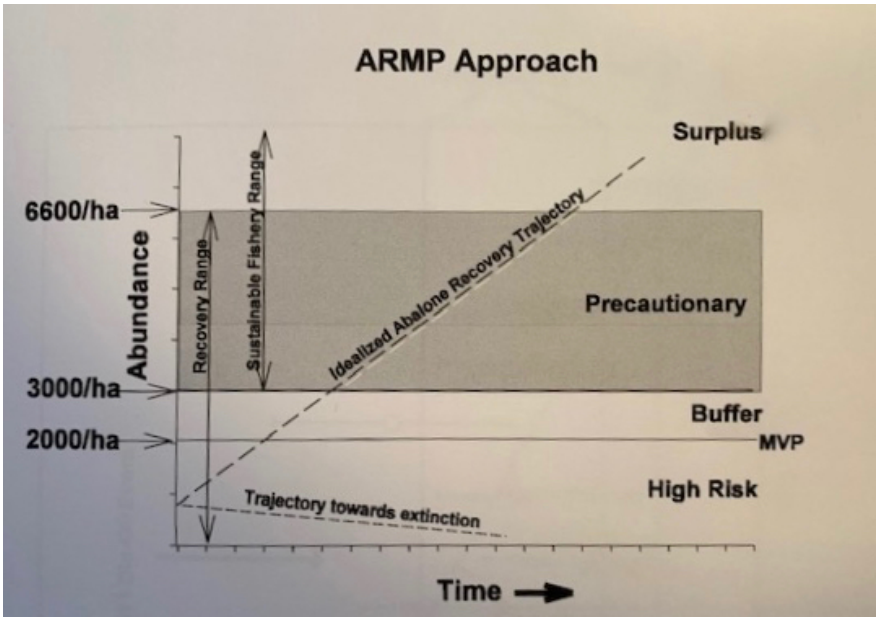
1) Focus resources on active management for Red Abalone RECOVERY
The Department should actively and diligently manage protected refuges to safeguard red abalone broodstock statewide; this would include identifying most productive locations with rugose, cryptic habitat, and actively removing urchins and restoring kelp in order to sustain red abalone broodstock until there is a change in ocean conditions that will enable these animals to survive. Plucking any animals out of the population could reduce the genetic diversity that may prove critical for adaption of these animals in response to the changing climate.

The Department should also establish new populations of red abalone at more deepwater locations in southern California's Channel Islands by proceeding with experimental translocation efforts, and drawing on new knowledge gained through the white abalone restoration project.

The text of the ARMP specifically stated that the bulk of resources available to the Department would be directed at restoration (Fig. 2); unfortunately this intent was subverted by political pressure of commercial fishermen to open a fishery on San Miguel Island and so active management for recovery has never been seriously implemented. The focus on serving only a narrow niche of Californians—commercial fishermen—has proven shortsighted in light of the current challenges red abalone now face.

The new Red abalone FMP should retain the word and intent of RECOVERY as a priority and a pre-condition to opening any fishery in the future.

Fig. 2 *The ARMPs foremost aim to recover abalone*



2) Retain Minimum Viable Population criteria and density triggers in the plan

A critically important feature of the 2005 ARMP were the prescribed density triggers that gave the Department clear guidance for specific management actions, avoiding the pitfalls of political subversion.

The fishery-independent criteria of density was chosen based on the long-established science of the Allee Effect (Lillie 1915; Stokesbury and Hillelman, 1993; and Claereboudft, 1999; and for abalone, Tegner et al., 1996, and Babcock and Keesing, 1999). In short, it posits that when abalone populations are reduced to too few animals, their capacity for reproduction plummets. For this reason, it is critically important to maintain a minimum viable population (MVP) to ensure survival of this animal that has only intermittent reproductive success. MVP was documented by for Australian abalone (Shepherd and Brown, 1993) and for California red abalone (Karpov et al 1998); findings from these peer reviewed studies became the basis for MVP in the ARMP, 0.2 per square meter.

Beyond retaining MVP, the new plan should also retain science-based density triggers (Kashiwada and Tanuguchi, 2007). With fishermen always pressing for more fishing opportunity, the Department has a long record of conceding rather than erring toward conservation, a tendency that has contributed to declining stocks across the board. Pre-determined triggers ensure that fishery management will be guided by science and not politics. For this reason, I recommend against giving discretion to the Department administrative staff to modify criteria; this will only compound the tendency for political pressure by fishermen to lead toward extirpation. The most effective bulwark against depletion would be a statewide target density of 0.3 animals per square meter before any fishery could be reopened.

Given the long-standing push by commercial fishermen to reopen San Miguel and the Farallon Islands to commercial take, the Commission needs to be eyes-wide open that removing prescribed triggers could create a likely crisis in the very near term, with fishermen continuing to press to allow commercial take or trophy take of the last red abalone broodstock refuges in our state.

3) Recognize climate change now demands more not less precaution

The sad story of abalone in California has been one of serial depletion with fishermen targeting different stocks until all will be extirpated (Karpov et al., 2000). Now with added cumulative impacts of the “Perfect Storm,” ocean acidification, and seawater warming, I am concerned that red abalone cannot withstand any fishing pressure, even at a de minimis level.

With climate change, it is crucial to recognize that every surviving animal is important for the future of the species (Vilchis et al., 2005). We’d not think about giving hunters the go-ahead to kill just a few California Condors; we should not be setting up a situation where fishermen will be pushing continually to kill the last red abalone as trophies.

For that reason, I applaud the Department for including an "Exceptional Circumstances" plan. In fact, I'd like to see it strengthened because we are already in "exceptional circumstances," with the kelp collapse and all red abalone populations around the state at "high risk," according to ARMP criteria.

Through my career at the CDFW, I always regarded Department scientists as the "peripheral vision" of the Commission, keeping an eye out for the long term sustainability and conservation of our precious marine resources. I have seen time and time again that the research, monitoring, and science of Department scientists has been kneecapped in favor of working toward consensus with stakeholders. While "win-win" consensus solutions may be possible when resources are abundant, when they are scarce, trending toward extinction, and ocean conditions are poor, the resources, in this case red abalone, will very likely lose, as will future generations of Californians.

For all these reasons, I implore the Commission to act as true stewards of California's precious abalone resource!

Please amend the proposed red abalone FMP to include the language and intent of recovery, including the goal of conserving a minimum viable population. Also, please retain a clear goal of recovering 3000 per ha (0.3 per square meter) statewide before even contemplating reopening any fishery for our remaining red abalone. If you have any further questions, I'd be happy to further discuss these matters further with any of you.

Sincerely,

Konstantin Karpov
Fort Bragg, California

LITERATURE CITED

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From: Mike Radis [redacted]
Sent: Monday, September 14, 2020 8:33 AM
To: FGC <FGC@fgc.ca.gov>
Subject: Continued illegal exhibiting of Stanley the giraffe by appellant Ronald Semler

Good morning CA FGC,

I would like the commission to be aware that it appears appellant Ronald Semler and family is continuing to exhibit his giraffe without any County and State permits to possess or exhibit him. The animal has been on no permit at all for several months now. It was not renewed and the prospect of an attempted appeal would not allow continued exhibition like it might in the case of a revocation in my opinion. This doesn't seem like someone acting in good faith at all, this looks more like someone challenging the county and states authority to regulate wildlife possession and exhibition.

[redacted]

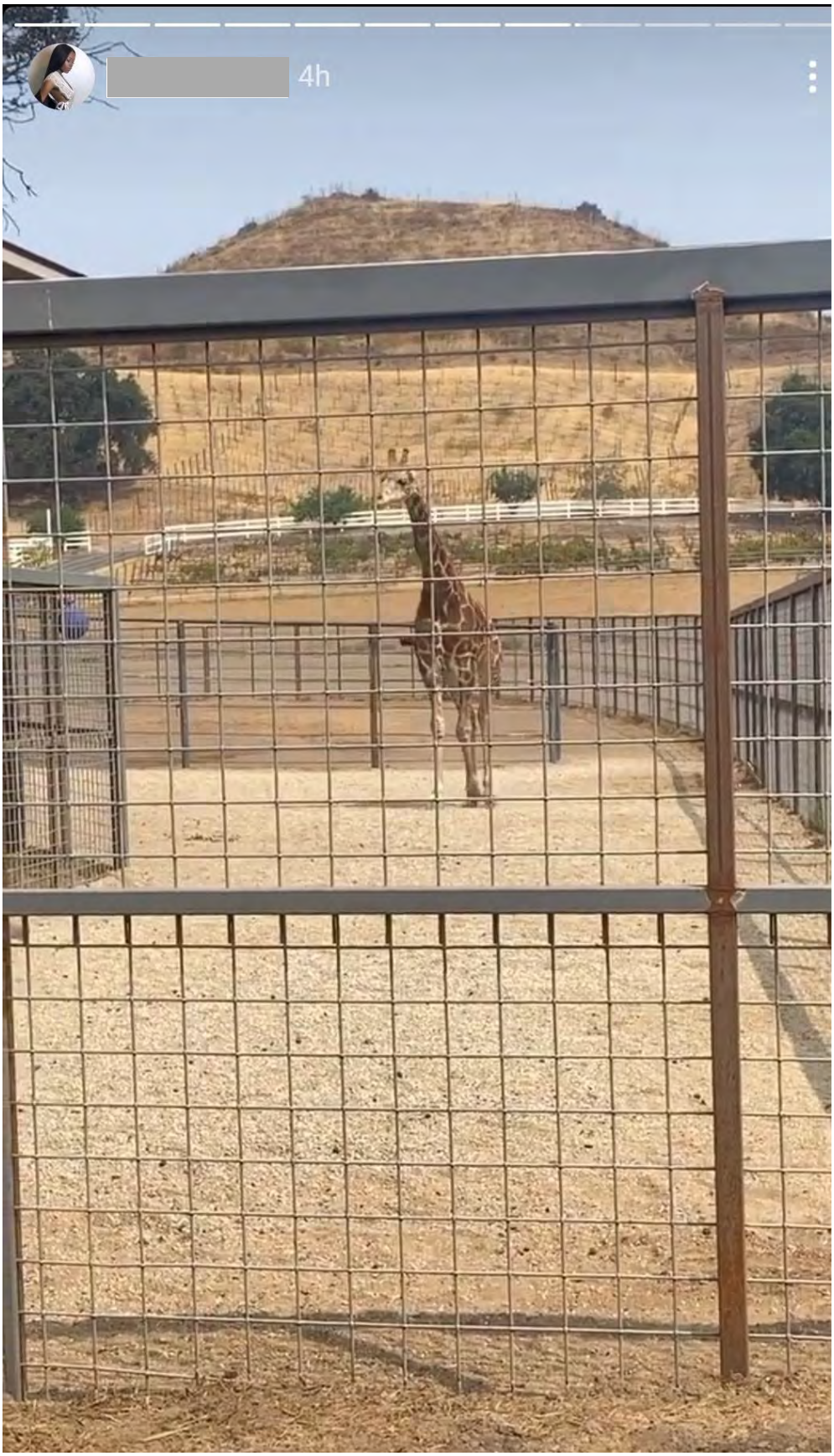
[redacted]

Looks like the business operated at the Semler's property operated by Ron's son Shane, Malibu Wine Hikes is continuing to exhibit Stanley in a modified manner without the wood platform but still exhibiting to the paying public nonetheless. In this instance you can hear the tour guide's commentary about Stanley. This shouldn't be happening still. Videos attached as well in case instagram story links have expired by the time this is read.

Thank you,

Mike


4h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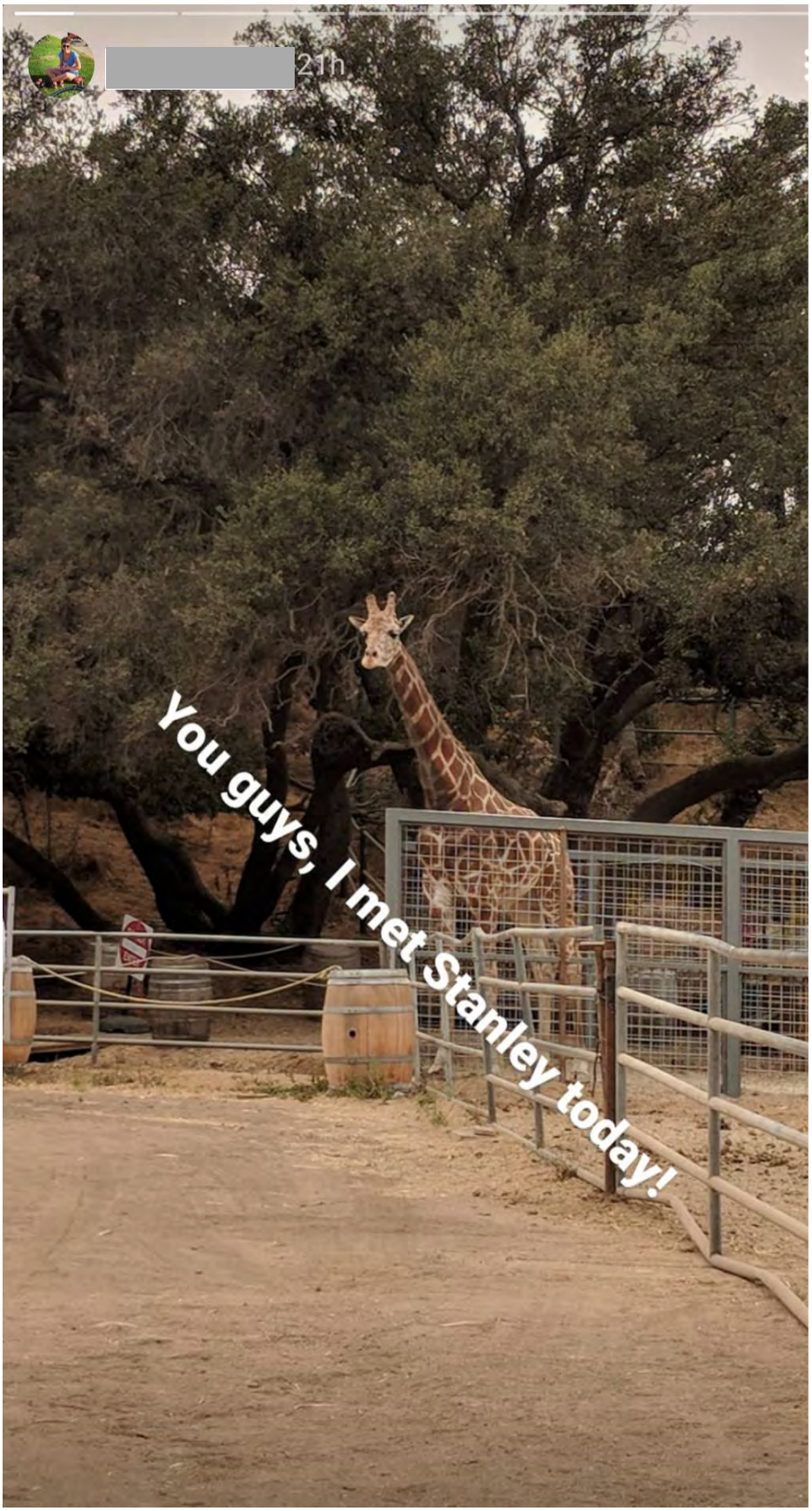
[redacted] 21h
You guys, I met Stanley today!


5h
MALIBU WINE HIKE
TAKE A HIKE!

From: Ray [redacted]
Sent: Wednesday, September 23, 2020 4:53 PM
To: FGC <FGC@fgc.ca.gov>
Subject: Lobster season

To whom it may concern:
DO NOT delay nor cancel lobster season. Marketing concerns should always be handled by individual fishermen, whether that be retail, direct marketing, domestic marketing or international marketing. There are currently multiple market opportunities for the creative fishermen that seek them out.
A delay or cancellation will benefit no one, and after the abrupt downturn of the lobster market in January, would be adding insult to injury.
Yes, to tailing lobster.
As far as tailing lobster, that would allow our Ca spiny lobster to compete with international products on a new level. It could also ease the flooding of domestic live markets and tank space.
Sincerely,
Ray Kennedy
FV Rainman
Santa Barbara
Sent from my iPhone

From: paul weakland [redacted]
Sent: Wednesday, September 23, 2020 6:34 PM
To: FGC <FGC@fgc.ca.gov>
Subject: World's Largest Floating Fish Factory | Sea Source | Free Documentary

https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fyoutu.be%2F3BkBNElldvg&data=02%7C01%7CFGC%40fgc.ca.gov%7C1f1ebbbf9fed485848f308d86029e016%7C4b633c25efbf40069f1507442ba7aa0b%7C0%7C1%7C637365080261240742&sdata=5KJJKf2VmxThkbXsOceN4cixVhXLhsjR7Wyc7Q1UoMQ%3D&reserved=0

Sent from my iPad

From: meyerranch[redacted]
Sent: Monday, September 28, 2020 3:28 PM
To: FGC <FGC@fgc.ca.gov>
Subject: RE: Re-sending Notice of Proposed Regulations: Recreational crab trap fishery

Regulation changes, horse crap, you can't get abalone, can't get this type fish you can't go here you can't go there, fish and game are WORTHLESS. NO HUNTING LICENSES AND NO MORE FISHING LICENSES you all suck at what you do. You need a real job maybe washing the streets of San Francisco with your tooth brush.

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: California Fish and Game Commission <fgc@fgc.ca.gov>
Date: 9/28/20 10:58 AM (GMT-08:00)
To: [redacted]
Subject: Re-sending Notice of Proposed Regulations: Recreational crab trap fishery

Like

California
Fish and Game Commission
Celebrating 150 Years of Wildlife Heritage and Conservation!

www.fgc.ca.gov

Greetings fish and wildlife stakeholder,

We are re-sending this notice to correct the link in the original notice.

A notice of proposed regulation changes concerning recreational crab trap fishery marine life protection measures has been posted to the Commission's website. The notice and associated

documents can be accessed at
https://fgc.ca.gov/Regulations/2020-New-and-Proposed#29_80

Please refer to the notice for additional information.

Sincerely,

Sherrie Fonbuena
California Fish and Game Commission

Know someone else who would be interested in our organization?

SHARE THIS EMAIL

Not yet signed up to receive our informative emails?

SIGN UP

From: afa@mcn.org <afa@mcn.org>
Sent: Wednesday, September 30, 2020 11:17 AM
To: Office of the Secretary CNRA <secretary@resources.ca.gov>; FGC <FGC@fgc.ca.gov>; Wildlife DIRECTOR <DIRECTOR@wildlife.ca.gov>; Cornman, Ari@FGC <Ari.Cornman@FGC.ca.gov>
Subject: "The Pall of Our Unrest," an obituary for the land, by Terry Tempest Williams]

Warning: This email originated from outside of CDFW and should be treated with extra caution.

---------- Original Message ----------
Subject: "The Pall of Our Unrest," an obituary for the land, by Terry Tempest Williams
From: afa@mcn.org
Date: Wed, September 30, 2020 10:22 am
To: afa@mcn.org
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https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fmountainjournal.org%2Fterry-tempest-williams-says-it-time-to-rally-for-nature-and-country&data=02%7C01%7Cfgc%40fgc.ca.gov%7C308acaefe05c464da2ba08d8656d049b%7C4b633c25efbf40069f1507442ba7aa0b%7C0%7C1%7C637370866946863312&sdata=sHZTxbiL2LRhP%2BnIdklzsOX6XQnVn1Kz5grEWeDMflw%3D&reserved=0

Brings to mind a saying from the late U. Utah Phillips: "The planet is not dying, it's being killed, and those doing the killing have names and addresses."

One of the most important actions you can take is to VOTE in the November 3 election, and encourage others to do likewise.

Please forward the Williams essay accordingly.

x
Eric Mills, coordinator
ACTION FOR ANIMALS
Oakland

From: afa@mcn.org <afa@mcn.org>
Sent: Thursday, October 1, 2020 1:28 PM
To: Office of the Secretary CNRA <secretary@resources.ca.gov>; FGC <FGC@fgc.ca.gov>; Wildlife DIRECTOR <DIRECTOR@wildlife.ca.gov>; Cornman, Ari@FGC <Ari.Cornman@FGC.ca.gov>
Cc: senator.skinner@senate.ca.gov; sentor.wieckowski@senate.ca.gov; assemblymember.wicks@assembly.ca.gov; assemblymember.bonta@assembly.ca.gov; senator.beall@senate.ca.gov; senator.bloom@senate.ca.gov
Subject: [Fwd: LETTER - FROGS/TURTLES - LIVE ANIMAL FOOD MARKETS]

Warning: This email originated from outside of CDFW and should be treated with extra caution.

My letter below ran in yesterday's CASTRO VALLEY FORUM (a Wednesday weekly).

Letters in response:

x
Eric Mills
ACTION FOR ANIMALS

---------- Original Message ----------
Subject: LETTER - FROGS/TURTLES - LIVE ANIMAL FOOD MARKETS
From: afa@mcn.org
Date: Mon, September 14, 2020 11:29 am
To:

September 14, 2020

Letter to the Editor
CASTRO VALLEY FORUM

CRIMES AGAINST NATURE

Senator Henry Stern's SB 1175 (live animal food markets) failed passage at the last minute, once again leaving environmental protection, animal welfare and the public health in the lurch. We've been fighting this battle since the miid-1990's.

California annually imports two million American bullfrogs, plus an estimated 300,000 freshwater turtles for human consumption. Most of the frogs are commercially-raised in China and Taiwan, the turtles are taken from the wild, depleting local populations. Non-natives all, these animals are routinely released into local waters, where they prey upon and displace our native species. Not acceptable!

Worse, the majority of the bullfrogs carry the dreaded chytrid fungus (Batrachochytrium dendrobatidis, or Bd), cause of the extinctions of 200+ amphibian species worldwide in recent years. Some 30 necropsies on the market frogs and turtles document that all are diseased and/or parasitized, though it is illegal to import and/or sell such products.
Where are the local health departments, pray? Or enforcement by the Dept.
of Fish and Wildlife?

Despite major support for a ban, the Department continues to issue the frog/turtle import permits, thereby endangering public health, the environment and animal welfare.

Write: Chuck Bonham, Director, DFW, 1416 Ninth Street, Sacramento, CA 95841, email - director@wildlife.ca.gov; and Wade Crowfoot, Resources Secretary, same address, email - secretary@resources.ca.gov; all legislators may be written c/o The State Capitol, Sacramento, CA 95814.

Sincerely,

Eric Mills, coordinator
ACTION FOR ANIMALS
[redacted]

CALIFORNIA FISH AND GAME COMMISSION
RECEIPT LIST FOR NONREGULATORY REQUESTS: RECEIVED BY 5:00 PM ON OCTOBER 1, 2020

Revised 10/06/2020

Date Received	Name/ Organization of Requestor	Subject of Request	Short Description	FGC Receipt Scheduled	FGC Action Scheduled
10/1/2020	Jeff Maassen	Request to commercially harvest Sargassum horneri	Submits an application to FGC to commercially harvest Sargassum according to the commercial kelp regulations, per Section 165(f) of Title 14, CCR.	10/14/20	12/9-10/2020

From: Jeff Maassen [redacted]
Sent: Thursday, October 1, 2020 4:29 PM
To: FGC <FGC@fgc.ca.gov>
Cc: Ashcraft, Susan@FGC <Susan.Ashcraft@fgc.ca.gov>
Subject: Sargassum Horneri--Request for Commercial Kelp harvest permit

Dear California Department of Fish and Game Commission,

Please see attached request packet for a commercial permit to harvest Sargassum Horneri.

Respectfully,

Lance Maassen
[redacted]

SARGASSUM HORNERI

Request for Commercial Kelp Harvest permit

Lance Maassen • October 2020

Dear California department of Fish and Game commissioners,

I am a Santa Barbara based Commercial Sea Urchin Fisherman and boat owner Over the last 35 years I have dive harvested within California's Subtidal waters for Sea Urchins from San Clemente Island to Fort Bragg. During this tenure I have collaborated and willingly shared information with CDF&W, UCSB, NOAA, Scripps, SDSU, USC, OPC and others to inform management and research and to hopefully ensure sustainable outcomes for Californias commercial fisheries.

I would like to request the issuance of a permit to Dive- harvest for the Invasive species "Sargassum Horneri". Over the past several years this species abundance appears to be spreading Northward has been observed to be over taking and choking out other indigenous species in the Southern California Bio region.

We are currently in discussions with San Luis Obispo based Kelp harvesting company "Kelpfulca" to collaborate in processing and distribution to explore opportunities utilizing Sargassum including utilizing in food as Seasonings, "Akamoku"(Soup), Beer, Soap and possibly a specialty fertilizer.

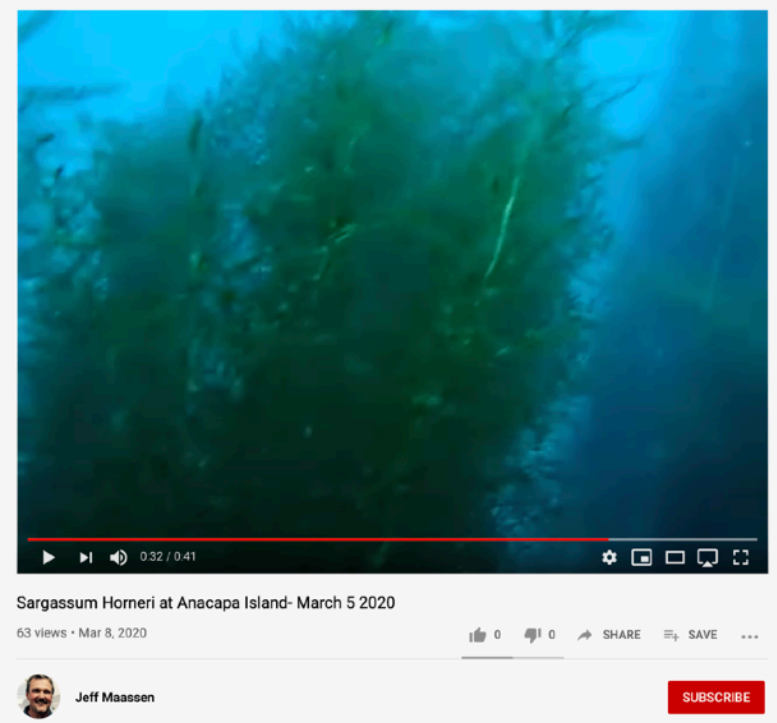
Pursuant to Title 14 regulatory compliance I would request some latitude and close collaboration with staff in tailoring some of the regulations and permit fees specifically towards the Hand harvesting of an invasive species which would be necessary to proceed. This would facilitate efficient scaling and enable measured ecological outcomes.

Thank You very much for your consideration,

Lance Maassen

f) All Other Species of Kelp.

(1) Applicant shall apply to the commission, outlining the species to be harvested, amount and location. The commission may set conditions and amount of royalty after review of the application.



Reference Videos:

Youtube video of Sargassum Horneri at Anacapa Island:

https://www.youtube.com/watch?v=iqo9ASD5GAk

https://agris.fao.org/agris-search/search.do?recordID=JP2009005623

1.§ 165. Harvesting of Kelp and Other Aquatic Plants.

2.14 CA ADC § 165BARCLAYS OFFICIAL CALIFORNIA CODE OF REGULATIONS
Term
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 & Annos)

14 CCR § 165
§ 165. Harvesting of Kelp and Other Aquatic Plants.
(a) General License Provisions. Pursuant to the provisions of Section 6651 of the Fish and Game Code, no kelp or other aquatic plants may be harvested for commercial purposes except under a revocable license issued by the department.
(1) Who Shall be Licensed. Each person harvesting kelp and other aquatic plants for profit shall apply each year for a license on 2015 Kelp Harvesting License Application (DFW 658 Rev. 08/14) which is incorporated by reference herein. License applications and a list of laws and regulations governing the harvest of kelp and other aquatic plants (including maps depicting administrative kelp beds) are available on request from the department's Los Alamitos office at 4665 Lampson Avenue, Suite C, Los Alamitos, CA 90720.
(2) Cost of License. See section 6651 of the Fish and Game Code.
(3) Where to Submit Applications. Application forms, together with the fee authorized by Section 6651 of the Fish and Game Code, shall be submitted to the department's Los Alamitos office, 4665 Lampson Avenue, Suite C, Los Alamitos, CA 90720.
(4) License Limitation. All provisions of sections 6650-6680 of the Fish and Game Code, and sections 165 and 165.5 of the commission regulations shall become a condition of all licenses issued under this section to be fully performed by the holders thereof, their agents, servants, employees or those acting under their direction or control.
(b) General Harvesting Provisions.
(1) Weighing of Kelp. A kelp harvester shall determine the weight of harvested kelp or other aquatic plants upon landing or delivery to the harvester's place of business. The harvester may determine the weight of harvested kelp or other aquatic plants by either direct weighing with a state certified scale or a volume conversion that has been approved by the department. If the weight is determined by a certified or licensed weighmaster, the harvester shall obtain a receipt and maintain the receipt in the landing record required under subsection (b)(3) below.
(2) Harvesting Records.
(A) Every person harvesting kelp and other aquatic plants and licensed pursuant to Section 6650 of the Fish and Game Code shall keep a record of the following:
1. Category of plants harvested as defined in subsections 165(c), (d) and (e).
2. The wet weight of harvested kelp or other aquatic plants recorded in pounds or tons (1 ton = 2000 lb).
3. Name and address of the person or firm to whom the plants are sold, unless utilized by the harvester.
(B) The record shall be open at all times for inspection by the department.

(3) Landing Records. Records of landing shall be prepared by all harvesters licensed pursuant to Section 6650 of the Fish and Game Code. Records of landing shall be made in triplicate using Kelp Harvester's Monthly Report forms FG 113 (Rev. 1/97, see Appendix A) and FG 114 (Rev. 1/07, see Appendix A).
(A) The landing records shall show:
1. The wet weight of all aquatic plants harvested in units as defined in subsection (b)(2)(A)2. above.
2. Name and address of harvester.
3. Department of Fish and Wildlife kelp harvester number.
4. Report period, royalty rate, balance of advance deposit (applicable to leased beds), royalty rate amount due and dates of landing.
5. Administrative kelp bed number and, if applicable, marine protected area where plants were harvested.
(B) A duplicate copy of the landing record shall be retained by a kelp harvester for a period of one year and shall be available for inspection at any time within that period by the department. A kelp harvester who harvests kelp from a marine protected area established under subsection 632(b) shall maintain a copy of the landing record on board the harvest vessel for all harvesting conducted during that harvest control period. The original and one copy of the landing record shall be submitted to the department's Accounting Services Branch at 1416 Ninth Street, Room 1215, Sacramento, CA 95814 (or by postal delivery to P.O. Box 944209, Sacramento, CA 94244-2090) on or before the 10th day of each month following the month to which the landing records pertain with the specified royalty required for all kelp and other aquatic plants harvested. Landing records that are mailed shall be postmarked on or before the 10th day of each month following the month to which the landing records pertain. The landing record shall be submitted whether or not harvest occurred.
(C) Failure to submit the required landing records of harvest activity and royalty fees within the prescribed time limit and/or failure to retain the required landing records for the prescribed time period(s) may result in revocation or suspension (including non-renewal) of the harvester's license for a period not to exceed one year. Any revocation, suspension, or nonrenewal may be appealed to the commission.
(4) No eel grass (Zostera) or surf grass (Phyllospadix) may be cut or disturbed.
(5) No kelp or other aquatic plant may be harvested in a state marine reserve or state marine park as per subsection 632(a). Commercial harvest of kelp or other aquatic plants may be limited in state marine conservation areas as per subsection 632(b).
(6) It is unlawful to cause or permit waste of any kelp or other aquatic plants taken in the waters of this state or to take, receive or agree to receive more kelp or other aquatic plants than can be used without waste or spoilage.
(c) Harvesting of Macrocystis and Nereocystis (giant and bull kelp). In this subsection, kelp means both giant and bull kelp.
(1) A kelp harvester may harvest kelp by cutting and removing portions of attached kelp or by collecting unattached kelp.
(2) A kelp harvester may not cut attached kelp at a depth greater than four feet below the surface of the water at the time of cutting.
(3) No kelp received aboard a harvesting vessel shall be allowed to escape from the vessel or be deposited into the waters of this state.
(4) In beds north of Point Montara, Nereocystis (bull kelp) may only be taken by hand harvesting. No mechanical harvesters of any kind shall be allowed.
(5) Between April 1 and July 31, a kelp harvester may not harvest bull kelp from a nonleased kelp bed that lies partially or totally within the boundary of the Monterey Bay National Marine Sanctuary extending from Santa Rosa Creek, San Luis Obispo County, northward to Rocky Point, Marin County. This subsection does not preclude the removal of bull kelp from beaches within the Monterey Bay National Marine Sanctuary during the seasonal closure.

(6) Prior commission approval of a kelp harvest plan is necessary before a kelp harvester may use a mechanical harvester to harvest giant kelp.
(A) A kelp harvest plan must identify how a mechanical harvester will be used while avoiding:
1. repetitive harvest from individual giant kelp plants;
2. harvest of bull kelp from those portions of kelp beds that contain both giant kelp and bull kelp; and
3. harvest of giant kelp near sea otter rafting sites used by female sea otters with dependent pups.
(B) All kelp harvest plans shall also include the following:
1. the number of the designated bed or beds as shown in subsection 165.5(j), a description of the kelp bed or portion of the kelp bed requested and the designated number of square miles in each bed or portion thereof;
2. intended use of kelp;
3. amount of kelp proposed to harvest on a monthly and annual basis during the next five years;
4. estimated frequency of harvesting activities for each kelp bed;
5. number of harvest boats, maximum kelp holding capacity in wet tons for each boat, including the operating vessel gross tonnage and fuel tank capacity;
6. harvesting methodology (harvest operation description);
7. all locations (addresses) where kelp landing and weighing will take place;
8. specific details of wet kelp weighing equipment and methods to be used at the landing sites for accurate reporting; and
9. name, address, phone number, and license number of kelp processor and method of transporting the kelp to the processing location.
(C) Kelp harvest plans must be updated and submitted to the commission for approval every five years.
(7) In addition to the license fee, a kelp harvester shall pay a royalty of $1.71 for each ton (2,000 lb) of wet kelp harvested from a non-leased bed.
(d) Harvesting of marine plants of the genera Gelidium, Pterocladia, Gracilaria, Iridaea, Gloiopeltis or Gigartina which are classified as agar-bearing plants.
(1) General Provisions.
(A) All agar-bearing plants must be harvested by cutting, except that drift or loose plants may be picked up by the harvester. Agar-bearing plants may be cut no closer than two inches to the holdfast and no holdfast may be removed or disturbed. All agar-bearing plants which are removed from a bed must be taken from the water for weighing and processing.
(B) While harvesting agar-bearing plants, it is unlawful to harvest abalone or to have abalone harvesting equipment in possession.
(C) License numbers of the harvesters will be displayed on both sides of the boat from which they are operating in 10-inch black numbers on a white background.
(D) A harvester may use conventional underwater diving gear or SCUBA when harvesting agar-bearing plants.
(2) Kelp Drying Permits. Pursuant to section 6653.5 of the Fish and Game Code, no company or individuals shall reduce the moisture content or otherwise dry agar-bearing plants harvested from waters of the state except under the authority of a kelp drying permit issued by the department. Drying permits shall be issued under the following conditions:
(A) Where Issued. Requests for kelp drying permits shall be submitted to the Department of Fish and Game at the address listed in section 165(a)(3).
(B) Cost of Permit. See subsection 699(b) of these regulations for the fee for this permit.
(C) Permit Review. The department shall return permit application forms to the applicant within three working days of receipt.

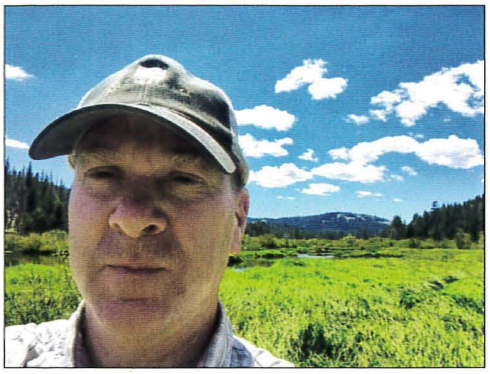
(D) Duration of Permits. Except as otherwise provided, kelp drying permits shall be valid for a term of one year from date of issue.
(E) Weighing of Kelp. All agar-bearing marine plants shall be weighed upon landing pursuant to the provisions of subsection (b)(1) of these regulations.
(F) Plant Delivery. Every person taking delivery of agar-bearing marine plants for drying purposes from persons licensed pursuant to section 6650 of the Fish and Game Code or harvesters drying their own plants shall keep a book or books recording the following:
1. A full and correct record of all agar-bearing plants received from other licensed agar harvesters or taken by permittee.
2. Names of the different species.
3. The number of pounds received.
4. Name, address and kelp harvester number of the person from whom the agar-bearing plants were received. The book(s) shall be open at all times for inspection by the department.
(G) Landing Receipts. Receipts shall be issued by all kelp drying permittees to harvesters licensed pursuant to subsection (b)(3) of these regulations and shall show:
1. Price paid.
2. Department origin block number where the agar-bearing plants were harvested.
3. Such other statistical information the department may require.
(H) The original signed copy of receipt shall be delivered to the agar harvester at the time of purchase or receipt of the agar-bearing plants. The duplicate copy shall be kept by the kelp drying permittee for a period of one year and shall be available for inspection at any time within that period by the department, and the triplicate shall be delivered to the department at the address indicated within 10 days after the close of each month, with a royalty of $17.00 per wet ton (2,000 lbs.) for all agar-bearing seaweed received. Failure to submit the required landing receipts and royalty fees within the prescribed time limit is grounds for revocation of the permittee's drying permit.
(e) Harvesting of marine plants, including the genera Porphyra, Laminaria, Monostrema, and other aquatic plants utilized fresh or preserved as human food and classified as edible seaweed.
(1) General Provisions.
(A) Edible varieties of marine plants must be harvested by cutting or picking, except that drift or loose plants may be picked up by the harvester. All harvested plants must be processed.
(B) Edible seaweed may be harvested from state waters throughout the year, except as provided under section 164.
(C) While harvesting edible seaweed, it is unlawful to harvest abalone or to have abalone harvesting equipment in possession.
(D) A harvester may use conventional underwater diving gear or SCUBA while harvesting edible seaweed.
(2) Harvest of Bull Kelp for Human Consumption. Notwithstanding subsection 165(c) (5)(A), persons operating under the authority of an edible seaweed harvesters license may take, not to exceed, 2 tons (4,000 lbs) of bull kelp per year. The entire plant may be harvested.
(3) Weighing of Edible Marine Plants. All edible marine plants shall be weighed pursuant to the provisions of subsection (b)(1) of these regulations and landing receipts in duplicate issued as per subsection (b)(3).
(4) The original copy of the receipt shall be delivered to the department at the address indicated within 10 days after the close of each month with a royalty of $24 per wet ton (2,000 lbs.) of edible marine plants harvested from state waters other than San Francisco Bay and Tomales Bay.

F) All Other Species of Kelp.
(1) Applicant shall apply to the commission, outlining the species to be harvested, amount and location. The commission may set conditions and amount of royalty after review of the application.

Note: Authority cited: Sections 6653 and 6653.5, Fish and Game Code. Reference: Sections 6650, 6651, 6652, 6653, 6653.5, 6654, 6656 and 6680, Fish and Game Code.

1. Amendment of subsection (a)(3) filed 10-8-69 as an emergency; designated effective 11-10-69 (Register 69, No. 41). For prior history, see Register 69, No. 15.
2. Certificate of Compliance -section 11422.1, Gov. Code, filed 12-17-69 (Register 69, No. 51).
3. Amendment of subsection (a)(1)(E) filed 6-30-77 as an emergency; effective upon filing (Register 77, No. 27).
4. Certificate of Compliance filed 8-24-77 (Register 77, No. 35).
5. Amendment filed 3-9-81; effective thirtieth day thereafter (Register 81, No. 11).
6. Amendment filed 9-6-85; effective thirtieth day thereafter (Register 85, No. 36).
7. Change without regulatory effect of subsection (e)(3) filed 5-5-86; effective thirtieth day thereafter (Register 86, No. 19).
8. Amendment of subsections (a)(2), (a)(3) and (c)(5) filed 1-27-87; effective thirtieth day thereafter (Register 87, No. 5).
9. Amendment of subsection (c) filed 12-3-90; operative 1-2-91 (Register 91, No. 4).
10. Amendment of subsections (a) and (d) filed 4-18-91; operative 5-18-91 (Register 91, No. 21).
11. Editorial correction of printing error in subsection (c)(3) (Register 91, No. 31).
12. Amendment of subsections (a)(3) and (c)(2), new subsections (c)(5)-(c)(5)(B), subsection renumbering and amendment of newly designated subsection (c)(6), and new subsection (e)(3) and subsection renumbering filed 3-26-96; operative 3-26-96 pursuant to Government Code section 11343.4(d) (Register 96, No. 13).
13. Amendment filed 10-25-2001; operative 11-24-2001 (Register 2001, No. 43).
14. Amendment of subsection (b)(5) filed 3-8-2005; operative 4-7-2005 (Register 2005, No. 10).
15. Change without regulatory effect amending subsection (a)(3) filed 5-5-2005 pursuant to section 100, title 1, California Code of Regulations (Register 2005, No. 18).
16. Amendment of subsections (b)(1), (b)(3), (b)(3)(D)-(F) and (c)(4)(D) filed 8-22-2007; operative 9-21-2007 (Register 2007, No. 34).
17. Editorial correction restoring inadvertently omitted subsection (c)(5) (Register 2011, No. 5).
18. Amendment of section and Note filed 1-14-2014; operative 4-1-2014 (Register 2014, No. 3).
19. Change without regulatory effect amending subsection (a)(1) filed 5-22-2014 pursuant to section 100, title 1, California Code of Regulations (Register 2014, No. 21).
20. Change without regulatory effect amending subsection (a)(1) filed 6-24-2015 pursuant to section 100, title 1, California Code of Regulations (Register 2015, No. 26).
21. Change without regulatory effect amending subsection (b)(3)(B) filed 8-8-2019 pursuant to section 100, title 1, California Code of Regulations (Register 2019, No. 32).

1870-2020 SESQUICENTENNIAL CELEBRATION CONTINUES



DIRECTOR CHARLTON H. BONHAM
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

PRESIDENT ERIC SKLAR (WITH WIFE, ERICA SKLAR)
CALIFORNIA FISH AND GAME COMMISSION

Acknowledging our Sesquicentennial 1870-2020

Historically, anniversaries are celebrated as a commemoration of achieving something special. A pause button against the flow of time—a recognized point in time to stop and praise a date, to make note of longevity. Anniversaries are like when you were a kid growing up and your parents had you stand up straight so they could score a hashmark where the top of your head lined up on the wall. They'd measure from the floor to the mark to show you how tall you were and how much you'd grown.

Throughout this year, the California Department of Fish and Wildlife and the California Fish and Game Commission have marked our 150th anniversary of managing and stewarding California's wildlife and natural habitats. As important a milestone as this is for us, a surreal feeling attaches itself to the celebration as we find ourselves in strange times—extraordinary times, really.

We are a state, a nation, a world in the midst of the coronavirus pandemic. For several months, our lives have been shaken with a realignment that has changed our existence. Simultaneously, we're seeing social unrest unparalleled in generations. The United States has struggled from its very beginning on issues of equity and justice—and what it means to ensure those values truly, finally for all, no matter the individual. In these already trying times, we're witnessing what may be our collective best chance for a more perfect union.

While we marked April as the official month for a joint sesquicentennial, the anniversary will forever be linked to our place in time right now. We should consider this time as a testament to how we respond. How do we take what we've learned and how we've grown over the last 150 years, combined with what we have adapted to in 2020, and continue trying to achieve our mission to save nature for everyone safely and equitably?

Well... we believe it is on us to act, and it is beyond due. Talking is important. Uncomfortable discussions are necessary. But, it's time to act. As director of the department and president of the commission, we commit to a future of inclusion,

equity and racial justice. We are collaboratively working to make structural changes to address racial inequity and to deconstruct institutional barriers.

In our own effort to become more informed, we turned to a recent assessment by the Audubon Society—"*Diversity and the Conservation Movement*"—which has this to say as the first paragraph in its introduction:

> Throughout its history, the mainstream conservation movement in the United States has mainly attracted a narrow segment of the population—primarily white, wealthier Americans. This demographic prevails today... This failure to include other segments of society is a serious limitation. It reduces the reach and impact of all groups working in conservation—from non-profit organizations to foundations to government agencies. All too often, it also means that the support of nature and conservation by people from diverse backgrounds—and the toll of environmental problems on less wealthy communities—is neglected or ignored.

If people don't see themselves doing a thing, or identify with someone in a particular occupation, they don't pursue it. This means not pursuing recreational opportunities like hiking, hunting and fishing. It means not pursuing conservation careers, and not only in scientific fields, as the department is home to a law enforcement division of almost 500 colleagues who help protect California's environment.

Our future at the department, at the commission, and in California is inclusiveness, equitability and openness to all. If just a small slice of the humans on this planet believe themselves to be part of the outdoors and the natural world, then only a small slice of us will be the ones trying to help make it last.

So, we will learn from experts, plan for and then create long-term changes embedding equity into commission and department culture, policies and practices. We are looking at ways to change our approaches to hiring and increasing the diversity of our candidate pools. We will teach and train current staff about implicit bias, how to recognize it and how to consciously adjust perspectives. Those of us in the narrow slice that have had the most power in the conservation movement will need to share that power. And more, much more.

We as a country, as a community, as people, must take the steps necessary to change institutional systems that support or cause injustice, inequity, racism and discrimination of all types. That figurative hash-mark on the wall showing how much we've grown over 150 years also shows we haven't grown enough in this respect. We can and will do better.

Eventually, the unrest will recede as the leading news story. Eventually, the pandemic will be beaten. But if we really take this moment for what it is, and pause to reflect on the goals that align with our core values of fairness, equity, freedom of speech and assembly, and justice, our hopes are high for the next 150 years.

As a milestone, our sesquicentennial is an important point in time to stop, reflect on the interwoven histories of the department and commission, and honor how far we've come. We've done some amazing things since those early days. It started with working to ensure the proper management of every wild animal and every acre of wilderness on our watch. Our charge has since grown to creating a more climate resilient planet. We must also acknowledge that we've made mistakes. Now is the time to break down barriers, to include those who haven't yet connected to our mission and learn why, and to create bridges that will help heal us and the planet, and all the species and habitats residing here.

California Fish and Game Commission

Staff Report on Staff Time Allocation and Activities

October 5, 2020

Given the challenges that Commission staff is facing, we are again reminded of the importance of how staff time is allocated. The recent service-based budgeting project further emphasized the need to prioritize workload given that the Commission does not have sufficient staffing and funding to meet its mission. While all the work of the Commission is important, insufficient resources requires prioritizing some activities over others.

This report identifies where time was allocated in general activity categories, trends in staff time allocation, and examples of the specific activities in which staff engaged during the months of August and September 2020.

General Time Allocation

Task Category	August Staff Time	September Staff Time
Regulatory Program	10%	14%
Non-Regulatory Program	4%	6%
Commission/Committee Meetings	37%	16%
Legal Matters	4%	5%
External Affairs	7%	6%
Special Projects	5%	7%
Administration	21%	25%
Leave Time	15%	21%
Unfilled Positions	6%	5%
Total Staff Time[1]	110%	107%

[1] *Total staff time is greater than 100% due to overtime*

Trends

Overall, task category allocation is relatively stable when compared to the previous two months. Administrative responsibilities related to the COVID-19 pandemic are ongoing, resulting in the sustained levels in the “administration” category. Staff continues to respond to high priority demands and modify staff activities as a result of the pandemic as it identifies other important tasks that are lesser priority and can be temporarily set to the side; this virtual reality is expected to be the norm for the foreseeable future.

With the onset of COVID-19, staff adjusted Commission meeting processes and procedures to the virtual format and continues to make adjustments with our new audio-visual and webcasting contractor, including researching ways to more closely align official meeting minutes with the format used pre-COVID.

Sample of Activities for August 2020

- Prepared for and conducted two publicly noticed meetings (August 18 Tribal Committee; August 19-20 Commission)
- Began preparations for two publicly noticed meetings (September 17 Wildlife Resources Committee; September 22 Commission)
- Responded to requests from the California Natural Resources Agency (CNRA), the California Government Operations Agency, and the California Department of Fish and Wildlife (CDFW) for data and information related to the COVID-19 pandemic
- Participated in weekly COVID-19 task force calls with CNRA and directors of other state agencies in the natural resource family
- Continued analysis of California Law Revision Commission's proposed changes to California Fish and Game Code
- Participated in Marine Protected Areas Statewide Leadership Team meeting
- Participated in Commercial Kelp Harvest South Pt. Montara Science Forum
- Coordinated with CDFW through executive staff and operations committee meetings, and participated in CDFW all-DFW broadcast
- Participated in California State Lands Commission strategic plan interviews
- Participated in wildlife conservation and wildlife behavior webinars
- Conducted bullfrog/non-native turtles stakeholder meetings

Sample of Activities for September 2020

- Prepared for and conducted two publicly noticed meetings (September 17 Wildlife Resources Committee and September 22 Commission)
- Began preparations for one publicly noticed meeting (October 14 Commission)
- Responded to requests from CNRA, the California Government Operations Agency, and CDFW for data and information related to the COVID-19 pandemic
- Participated in biweekly COVID-19 task force calls with CNRA and directors of other state agencies in the natural resource family
- Began the process to develop a justice/equity/diversity/inclusion plan
- Attended annual meeting of the Association of Fish and Wildlife Agencies
- Attended the Cultural Justice for Tribes Summit sponsored by California tribal historic preservation officers and the State Historic Preservation Officer
- Assisted CNRA in reviewing ten proposals for two marine protected area communication contracts
- Coordinated with CDFW through executive staff and operations committee meetings, and participated in CDFW staff broadcast meeting with CDFW director
- Participated in wildlife conservation and wildlife behavior webinars and a Secretary Speaker Series event
- Participated in implicit bias awareness training
- Participated in multi-agency meeting: Pre-existing Structures in MPAs Working Group
- Began recruitment activities for seasonal clerk and Sea Grant State Fellow 2021
- Conducted bullfrog/ non-native turtles stakeholder meetings

- Responded to survey request from CNRA on workplace telecommute needs for the new resources building

Sample Tasks for the General Allocation Categories

Regulatory Program

- Coordination meetings with DFW to develop timetables and notices
- Prepare and file notices, re-notices, and initial/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
- Facilitate CEQA document review, certification of findings, and filing with state clearinghouse.

Non-Regulatory Program

- DFW partnership, including jointly developing management plans and concepts
- 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 regulatory petitions

Legal Matters

- Public Records Act requests
- California Law Review Commission
- 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
- Website maintenance

Special Projects

- Coastal Fishing Communities
- Fisheries Bycatch Workgroup
- Streamline routine regulatory actions
- Strategic planning
- Aquaculture best management practices
- Document accessibility
- Service-based budgeting

Administration

- Staff training and development
- Purchases and payments
- Contract management
- Personnel management
- Budget development and tracking
- Health and safety oversight and COVID-19 responses
- Internal processes and procedures
- Document archival

Leave Time

- Holidays
- Sick leave
- Vacation or annual leave
- Jury duty
- Bereavement
- Contact tracing

State of California
Department of Fish and Wildlife

Memorandum

Date: September 11, 2020

Received 10/7/2020;
Original signed copy on file

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: **Item for the October 14-15, 2020, Fish and Game Commission Meeting: Research Use Allowance of KNOCEAN Sciences, Inc. Kelp Bed Lease 3, San Diego County**

During the June 20, 2018 Fish and Game Commission (Commission) meeting, the Commission granted KNOCEAN Sciences, Inc. (KNOCEAN) a five-year lease renewal of Administrative Kelp Bed 3 (Kelp Bed), for the exclusive harvest of Giant Kelp (*Macrocystis pyrifera*) for commercial purposes pursuant to Fish and Game Code (FGC) 6700.

Although KNOCEAN has the exclusive privilege to harvest Giant Kelp in Kelp Bed 3, the Commission may allow the removal of Giant Kelp for other uses per FGC 6708 and Kelp Bed lease condition 14 (see attached executed lease). The Commission has previously approved Dr. Matthew Edwards, San Diego State University to perform research activities involving Giant Kelp in KNOCEAN leased Kelp Bed 3.

SeaWorld, San Diego has requested to take Giant Kelp in the Kelp Bed 3 for enrichment and animal welfare use. Giant Kelp will be used as natural environment enrichment for the pinnipeds, cetaceans, fish, and invertebrates. In addition, Giant Kelp will be provided as a food source for invertebrate species housed at the facility. Although it is possible for SeaWorld, San Diego to harvest Giant Kelp outside of Kelp Bed 3, the available harvest sites add significant travel time (1-3 hours) and present safety concerns due to heavy surf and swell.

Activities of SeaWorld, San Diego will be reviewed and, as appropriate, permitted through a Scientific Collecting Permit (SCP). KNOCEAN has provided written agreement for the proposed Giant Kelp removal by SeaWorld, San Diego in Kelp Bed 3 (see attached email).

The Department of Fish and Wildlife (Department) recommends approval of the Giant Kelp removal activities requested by SeaWorld, San Diego in Kelp Bed 3. Upon Commission approval, Eric Otjen with SeaWorld San Diego will submit a request to the Department to modify their existing SCP.

If you have any questions regarding this item, please contact Dr. Craig Shuman, Marine Regional Manager at (916) 373-5491.

Attachments

ec: Stafford Lehr, Deputy Director
Wildlife and Fisheries Division
Stafford.Lehr@wildlife.ca.gov

Craig Shuman, D. Env., Regional Manager
Marine Region
Craig.Shuman@wildlife.ca.gov

Kirsten Ramey, Env. Program Manager
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Adam Frimodig, Sr. Env. Scientist Supervisor
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Rebecca Flores Miller, Environmental Scientist
Marine Region
Rebecca.FloresMiller@wildlife.ca.gov

STATE OF CALIFORNIA
Gavin Newsom, 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

July 25, 2019

Anthony Copp, PhD
Chief Executive Officer
KNOCEAN Sciences, Inc.
6614 Darbrook Drive
Dallas, TX 75254

Dear Mr. Copp:

Enclosed for your records is the signed, fully executed lease agreement between KNOCEAN Sciences, Inc. and the California Fish and Game Commission for Kelp Bed No. 3, California Department of General Services Lease No. K-2895.

If you have questions or concerns regarding your lease, please feel free to contact David Thesell of my staff at (916) 654-9903.

Sincerely,

Melissa A. Miller-Henson

Melissa Miller-Henson
Acting Executive Director

Enclosure

ec: Kirsten Ramey, Program Manager, State Managed Marine Finfish, California Department of Fish and Wildlife, Kirsten.Ramey@wildlife.ca.gov

LEASE GRANTING THE EXCLUSIVE PRIVILEGE OF HARVESTING KELP AT KELP BED NO. 3

THIS LEASE GRANTING THE EXCLUSIVE PRIVILEGE OF HARVESTING KELP AT Bed No. 3 ("Lease") is made and entered into upon execution, by and between KNOCEAN Sciences, Inc., ("Tenant") and the California Fish and Game Commission ("State") with reference to the following facts:

RECITALS

WHEREAS, Fish and Game Code Section 6700 authorizes State to lease to any person the exclusive privilege to harvest kelp in any designated kelp bed if it determines that such lease is in the public interest; and

WHEREAS, Tenant desires to lease Kelp Bed No. 3 to harvest kelp for nutraceutical and cosmeceutical products and functional food ingredients; and

WHEREAS, State desires to enter into a lease agreement for the exclusive privilege to harvest kelp in any designated kelp bed if it determines that such lease is in the public interest; and

WHEREAS, On April 11, 2012, State awarded a lease for Kelp Bed No. 3 to Tenant for a period of five years; and

WHEREAS, On July 11, 2013 the lease was executed and term commenced; and

WHEREAS, On November 27, 2017, Tenant requested to renew Lease in accordance with its terms;

NOW THEREFORE, On June 20, 2018, State awarded lease for Kelp Bed No. 3 to Tenant and approved terms and conditions for the Lease contained herein.

TERMS AND CONDITIONS

1. **LEASE.** State hereby grants to Tenant the exclusive privilege to harvest kelp in Kelp Bed No. 3 upon and subject to the terms and conditions of this Lease.

2. **DESCRIPTION.** This Lease covers those areas comprising approximately 2.58 square miles as Kelp Bed No. 3 as described in Title 14, California Code of Regulations, Section 165.5(j).

3. **TERM.** This Lease is for a term ("Term") commencing on the date last signed below November 14, 2018 and ending five years after, November 13, 2023, unless renewed or sooner terminated in accordance with its terms.

4. MODIFICATION OR TERMINATION. Fish and Game Code Section 6700 requires that any exclusive lease to harvest kelp, granted by State, must be in the public interest, as determined by State. In addition, Fish and Game Code 6654 provides that "If, at any time, the Commission finds that the harvesting of kelp will tend to destroy or impair any kelp bed or beds, or parts thereof, or tend to impair or destroy the supply of any food for fish, the Department shall serve on every person licensed to harvest kelp a written notice that the kelp bed or beds, or parts thereof, shall be closed to the kelp bed or beds, or parts thereof, shall be closed to the harvesting of kelp for a period not to exceed one year." Upon written notice from State, based upon the foregoing authority and describing the concern prompting the notice, Tenant shall comply with any direction therein to reduce or cease any or all activities, until such time as State can determine whether the continuation of any or all activities initially permitted by the Lease remains in the best interest of the public.

5. ROYALTY. In addition to any kelp harvesting license fee required, Tenant shall pay State a royalty rate of $3.00/ton of wet kelp harvested from the leased area.

6. ADVANCE PAYMENT. On penalty of lease forfeiture, commencing January 1st of each year during the term of this lease, Tenant, on or before the date due, shall pay to State a nonrefundable advance payment of $11,610.00 for Kelp Bed No. 3. The advanced payment for Kelp Bed No. 3 is calculated by multiplying the royalty rate in Paragraph 5 herein times 2.58 square miles of bed pursuant to Title 14, California Code of Regulations, Section 165.5(j) times 1,500, computed pursuant to Title 14, California Code of Regulations, Section 165.5(g). Kelp harvested from Kelp Bed No. 3 will be credited against this advance payment at the royalty rate payable under Paragraph 5, until the deposit has been depleted. Kelp harvested in any calendar year after January 1 of the year this Lease first was entered into, in excess of the amount covered by the advance deposit for that year shall be assessed at the end of each month at the basic royalty rate in Paragraph 5. Advance payments shall be delivered to California Department of Fish and Wildlife, Administrative Services Branch, 1416 Ninth Street, 1 ih Floor, Sacramento, California 95814 on or before January 15. Any surplus remaining from the annual advance payment shall be credited to the following annual advance payment. Payment shall be made to State in lawful money of the United States, provided that, if any payment made by a check, draft or money order is returned to State due to insufficient funds or otherwise, State shall have the right, upon written notice to Tenant to require Tenant to make all subsequent payments in cash, or by cashier's or certified check.

7. RENEWAL. If State determines Tenant has complied with the terms of the Lease, the Tenant shall have a prior right to renew the Lease on terms agreed upon with State. To preserve this prior right, Tenant must request to renew this Lease by written notice to State mailed at least 120 days and not more than 180 days prior to the expiration of the current term. If such notice is not timely given, or if Tenant is not in compliance with the terms of the existing Lease, the existing Lease, including any right to renew, shall terminate upon expiration of the then current term. State and Tenant agree that if, by the date the existing Lease is to expire, the terms of any renewal lease have not been agreed to, State may cease negotiations and declare this Lease terminated with no right to renewal. Notwithstanding the foregoing, State and Tenant, at any time during the term of this Lease, may negotiate and enter into a new lease on terms agreed upon between them. In no event shall Tenant's period of occupancy under the initial term of this Lease extend beyond 20 years. Similarly, the term of any renewal of this Lease shall not exceed 20 years.

8. LATE PAYMENT. Payment of advance payments are timely if received by State on or before January 15. Any advance payment not received by State by January 15, regardless of whether the due date falls on a Saturday, Sunday, or holiday, will be subject to a late penalty consisting of an administrative charge, calculated at the rate of ten percent (10%) of the amount of the late payment. The parties agree that the late charge represents a fair and reasonable estimate of the costs State will incur because of late payment. Acceptance of the late charge by State shall not constitute a waiver of Tenant's default for the overdue amount, nor prevent State from exercising other rights and remedies granted under this Lease. Tenant shall pay the late charge as additional rent within 30 days of the due date of the original payment.

Any annual advance payment not received by State within ninety (90) days of January 15 shall constitute a breach of Lease, giving rise to State's remedies as set forth herein.

Payments of royalty assessments due after exhaustion of the advance payment are due by the 10th day of the month following the assessment. At the end of each calendar year, Tenant shall be assessed a late payment fee of $100 for each month that royalty payments due to the State are received after the 10th day of the month for which they are due. Failure of Tenant to submit royalty payments due to the State by the 10th day of the month for which they are due for more than three (3) months in any calendar year shall constitute a breach of Lease, giving rise to State's remedies as set forth herein.

Upon written request by Tenant to State, demonstrating unusual or extenuating circumstances causing the late payment, State, in its sole discretion, may waive the late charge or penalty.

9. HOLDOVER. If the Term in Paragraph 3 expires and the Lease has not been renewed pursuant to Paragraph 6, and Tenant remains in possession of the Lease area with State's express or implied permission, Tenant shall become a tenant from month to month only, subject to all the provisions of this Lease except Paragraphs 3 and 6. During this holdover tenancy, kelp harvest may continue and paid for at the bid royalty rate in accordance with Paragraph 5. It is expressly understood that a holdover tenancy does not create any right of renewal beyond that provided by Fish and Game Code Section 6704 as set forth in Paragraph 6, and that the only purpose of a holdover tenancy is to allow continuity of use of the property while State continues to negotiate renewal terms or undertakes to issue a new lease to the highest responsible bidder pursuant to Fish and Game Code Section 6702 and Title 14, California Code of Regulations, Section 165.5. If either party desires to terminate such holdover tenancy, it shall give the other party not less than thirty days advance written notice of the date of termination.

10. INCORPORATION BY REFERENCE. The provisions of Chapter 6 of Division 6 of the Fish and Game Code (commencing with Section 6650) and the regulations at Title 14, California Code of Regulations Sections 165 and 165.5, are made part of this Lease by this reference. If there is a conflict between any term or condition of this Lease and any of the provision(s) incorporated by reference in it, the incorporated provision(s) shall control.

11. INDEMNITY. (For purposes of this Paragraph, the term, "State", shall include the California Department of Fish and Wildlife as well as the California Fish and Game Commission). Tenant hereby waives all claims and recourse against State, including the right to contribution for loss or damage to persons or property arising from, or in any way connected with or incident to this Lease, except claims arising from, and only to the extent of the gross negligence or willful misconduct of State, its officers, agents or employees.

Tenant shall notify the California Department of Fish and Wildlife Kelp Coordinator immediately in case of any serious accident, injury, or casualty on, or potentially related to, the Lease area.

Tenant shall protect, indemnify, hold harmless, and defend State, its officers, agents or employees, against any and all claims, demands, damages, costs, expenses or liability costs arising out of the use by Tenant, including its employees and agents, of the Lease area, except for liability arising out of, and to the extent of, the gross negligence or willful misconduct of State, its officers, agents or employees for which State is found liable by a court of competent jurisdiction.

Should State be named as a defendant in any claim or legal action arising out of the use by Tenant, including its employees and agents, of the Lease area, upon tender of the claimor action by State to Tenant, the Tenant shall assume State's defense and represent State in such legal action at Tenant's expense, subject to the provisions herein.

In lieu of tender to Tenant of the claim or action against State, State may elect to represent itself, in which event, State shall bear its own litigation costs, expenses and attorney fees. Notwithstanding the foregoing, in the event State is required to represent itself because of a conflict of interest by counsel representing Tenant, then Tenant, upon demand by State, shall reimburse State for State's litigation costs, expenses and attorney fees. Costs shall include, without limitation, all attorney fees and costs, court costs, if any, costs of mediators or arbitrators, experts and consultants, and any other costs reasonably incurred in response to any claim.

12. INSURANCE. Tenant shall obtain and maintain in full force and effect at all times during the Lease term a policy or policies of insurance, insuring Tenant, State and all other agencies of the State of California against any and all claims or liability for bodily injury, personal injury and property damage based upon or arising out of the use, occupancy, condition or maintenance of the leasehold. Each policy shall be written on an occurrence basis, and shall identify the Lease by its assigned number. The required insurance shall meet the following requirements:

(a) Commercial General Liability: For general aggregate, product/completed operations, personal and advertising injury, $1 million, with a combined single limit no less than $1 million per occurrence.

(b) Worker's Compensation and/or Employer's Liability: In a form and amount covering Tenant's full liability as required under federal and state law.

(c) Pollution Liability: For vessels owned, hired, scheduled or non-owned with a combined single limit no less than $1 million per occurrence.

Evidence of Insurance: The coverage provided by Tenant shall be primary and non-contributing, and shall not limit the liability of Tenant. Tenant shall furnish to State certificate(s) of insurance reflecting the foregoing. The certificate(s) of insurance shall:

(a) Be furnished to State, and no such policy shall be cancelable or subject to reduction of coverage or other modification except after 30 days prior written notice to State.

(b) Ensure State and all other agencies of the State of California, its officers, agents, employees and servants are included as additional insured but only insofar as the operations under the Lease are concerned.

(c) Provide that State shall not be responsible for any premiums or assessments on any policy of insurance hereunder.

(d) Comply with those standards as determined by the State of California, Department of General Services, Office of Risk and Insurance Management. In the event said insurance, or any of it, expires or lapses at any time during the term of this Lease, the Tenant agrees to provide, no later than fifteen (15) days after said expiration or lapse, written evidence of required insurance coverage from the date of loss of the earlier insurance and continuing for not less than the remainder of the term of the Lease. Tenant's failure to keep in effect at all times all insurance required by this Lease shall be grounds for termination of the Lease, in addition to any other remedies available to State.

13. NOTICES. Notices to the parties to this Lease shall be made in writing and may be given by delivery in person, by U.S. Mail with postage prepaid, or by receipt-confirmed facsimile to:

CALIFORNIA FISH AND GAME COMMISSION
PO Box 944209
Sacramento, CA 94244-2090
Telephone: (916) 653-4899

KNOCEAN Sciences, Inc.
6614 Darbrook Drive
Dallas, TX 75254
Telephone: (214) 738-7973

DEPARTMENT OF GENERAL SERVICES
Lease Management – Lease No. L-2895
P. O. Box 989052
West Sacramento, CA 95798-9052
Phone: (916) 375-4172

Notices shall be deemed given upon delivery to the addressee. If a notice is delivered to the addressee after 5:00 p.m. Pacific time, or on a Saturday, Sunday or State of California or national holiday, the notice shall be deemed given on the next business day. Either party may change in its address for notice purposes by giving written notice to the other party in the manner provided in this section.

14. USE. Tenant shall use the Lease area only for the purpose stated in this Lease, and such use shall be continuous from commencement of the Lease term until its expiration or termination, including any holdover tenancy.

The Lease area shall be continuously used by Tenant to conduct kelp harvest operations, in accordance with Title 14, California Code of Regulations, Sections 165 and 165.5, and all other laws and regulations. Tenant shall not use or permit the Lease area to be used in whole or in part during the term of this Lease for any purpose, other than as set forth herein, without the prior written consent of State.

The possessory interest herein given to Tenant does not exclude the general public from the Lease area, and Tenant may not unreasonably impede public access to state waters for purpose of fishing, navigation, commerce or recreation or other public trust values.

This Lease is not intended to confer third party beneficiary status to anyone benefiting from the terms of this Lease. The possessory interest is further subject to all valid and existing contracts, leases, licenses, encumbrances, and claims of title which may affect the Lease area.

This Lease provides a tenancy of a temporary nature. The parties to this Lease agree that no Relocation Payment or Relocation Advisory Assistance pursuant to the Government Code sections 7260 et seq., or any regulations implementing or interpreting such sections will be sought or provided in any form as a consequence of this tenancy.

15. CONTINGENCIES. By entering into this lease, the Tenant understands and agrees that the exclusive right to harvest kelp within the leased bed(s) may be subject to additional restrictions or limitations imposed by subsequent action of the Fish and Game Commission.

16. NON-DISCRIMINATION. In its use of the Lease area, Tenant shall not discriminate against, harass, or allow harassment against any person or class of persons on the basis of race, color, creed, religion, national origin, ancestry, sex, sexual orientation, age, marital status, medical condition, disability, or any other class protected under State, Federal or local laws.

Tenant shall ensure that the evaluation and treatment of its employees and applicants for employment are free from such discrimination and harassment.

Tenant shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.) and the applicable regulations promulgated thereunder (California Code of Regulations, Title 2, Section 7285.0 et seq.). Tenant shall give written notice of its obligations under this clause to labor organizations with which it has a collective bargaining or other agreement. Tenant shall include the non- discrimination and compliance provisions of this clause in all contracts to perform work under and/or in connection with this Lease.

Tenant shall be solely responsible for complying with the requirements of the Americans With Disabilities Act of 1990 (P.L. 101-336, commencing at Section 12101 of Title 42, United States Code and including Titles I, II and III), the Rehabilitation Act of 1973, and all related regulations, guidelines and amendments to both laws.

17. DRUG-FREE WORKPLACE. Tenant will comply with the requirements of the Drug-Free Workplace Act of 1990, as amended, and will provide a drug-free workplace by taking the following actions:

(a) Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations.

(b) Establish a Drug-Free Awareness Program to inform employees about:
- (1) The dangers of drug abuse in the workplace;
- (2) The Tenant's policy of maintaining a drug-free workplace;
- (3) Any available counseling, rehabilitation and employee assistance programs; and,
- (4) Penalties that may be imposed upon employees for drug abuse violations.

(c) Provide that every employee who works on the Lease area will:
- (1) Receive a copy of the Tenant's drug-free policy statement; and,
- (2) Agree to abide by the terms of the Tenant's statement as a condition of employment on the Lease area.

Failure to comply with these requirements may result in suspension or termination of this Lease, and Tenant may be ineligible for award of any future State Kelp Leases if the State determines that any of the following has occurred:

(a) The Tenant has made false certification, or
(b) Violated the certification by failing to carry out the requirements as noted above.

18. NO WARRANTY. This Lease is made without warranty of title, condition or fitness of Kelp Bed No. 3 for the Tenant's intended purpose or use.

19. COMPLIANCE. As a necessary condition for this Lease, Tenant must obtain and maintain all necessary permits and any other entitlements, including a valid Kelp Harvesting License. Tenant shall comply with all applicable federal, state and local laws, including laws relating to public health and safety, resource conservation and environmental protection.

For any leased bed(s) north of the County of Monterey, not more than 5 percent of the total weight of kelp harvested in any one day shall consist of bull kelp (*Nereocystis*).

20. REPORTS AND RECORDS. State may require Tenant to submit any periodic reports it deems necessary for the proper administration of State Kelp Lease at Kelp Bed No. 3.

Tenant agrees that State, the California Department of Fish and Wildlife, and the California Bureau of State Audits, or their designated representative, shall have the right to review and copy any records and supporting documentation pertaining to the performance of this Lease. Tenant agrees to maintain such records for possible audit for a minimum of three years after final payment. Tenant agrees to allow the auditor(s) prompt access to such records during normal business hours and similarly to allow interviews of any employees who might reasonably have information related to such records. Tenant agrees to include a similar right of the State to audit records and to interview staff in any sublease or contract related to performance of this Lease.

21. CONFLICTS OF INTEREST. Tenant warrants that no official, employee in the state civil service or other appointed state official, or any person associated with same by blood, adoption, marriage, cohabitation, and/or business relationship:

(a) Has been employed or retained to solicit or aid in the procuring of this Lease; or

(b) Will be employed in the performance of this Lease without the immediate divulgence of such fact to State.

In the event State determines that the employment of any such official, employee, associated person, or business entity is not compatible, Tenant shall terminate such employment immediately. For breaches or violations of this Paragraph, State shall have the right to annul this Lease without liability.

22. EXPATRIATE CORPORATION. Tenant hereby declares that it is not an expatriate corporation or subsidiary of an expatriate corporation, within the meaning of Public Contract Code sections 10286 and 10286.1 and is eligible to contract with State.

23. BREACH. The occurrence of any one of the following shall constitute a breach of this Lease by Tenant:

(a) Failure of Tenant to make any annual advance payment within ninety (90) days of January 15;

(b) Failure of Tenant to submit royalty payments due to the State by the 10th day of the month for which they are due for more than three (3) months in any calendar year;

(c) Abandonment of the Lease area determined after State has followed the procedures set forth in Civil Code Section 1951.3.

Should a threat to public health or safety or to the environment be created or exist on the Lease area, State may declare an emergency event and, unless an alternative arrangement is preferable in State's discretion, may enter upon and take possession of the Lease area to remedy the emergency without prior notice and/or demand an assignment of the right to operate the Lease area. Upon entering the Lease area under this Section, State shall provide immediate notice of such action by hand delivery or fax of its declaration to Tenant.

State may retain possession of the Lease area until the emergency event has been completely and adequately addressed to State's satisfaction. Where a breach of this Lease has caused or exacerbated the emergency event, or where the Tenant is non-cooperative in allowing or addressing any remedial action necessary because of the emergency event, State may terminate the Lease.

State shall not be liable in any manner for any inconvenience, disturbance, loss of business, nuisance or other damage arising out of State's entry in the Lease area as provided herein, except damage resulting from the willful misconduct of State or its authorized representatives.

Any failure by Tenant to observe or perform another provision of this Lease where such failure continues for thirty (30) days after written notice thereof by State to Tenant; any such notice shall be deemed to be the notice required under Code of Civil Procedure Section 1161. However, if the nature of Tenant's breach is such that it cannot reasonably be cured within the thirty (30) day period, Tenant shall not be deemed to be in breach if Tenant shall commence such cure within the thirty (30) day period and thereafter diligently prosecutes such cure to completion.

Neither this Lease nor any interest of Tenant hereunder in the Lease area shall be subject to involuntary assignment or transfer by operation of law in any manner whatsoever, including, without limitation, the following:

(a) Transfer by testacy or intestacy;

(b) Assignments or arrangements for the benefit of creditors;

(c) Levy of a writ of attachment or execution on this Lease;

(d) The appointment of a receiver with the authority to take possession of the Lease area in any proceeding or action in which the Tenant is a party; or

(e) The filing by or against Tenant of a petition to have Tenant adjudged a bankrupt, or of a petition for reorganization or arrangement under any law relating to bankruptcy.

Any such involuntary assignment or transfer by operation of law shall constitute a breach by Tenant and State shall have the right to elect to take immediate possession of the Lease area, to terminate this Lease and/or invoke other appropriate remedies, in which case this Lease shall not be treated as an asset of Tenant.

Notices of breach shall specify the alleged breach and the applicable Lease provision and shall demand that Tenant perform the provisions of this Lease within the applicable time period or quit the Lease area. No such notice shall be deemed a forfeiture or a termination of this Lease unless State specifically so states in the notice.

24. REMEDIES. In the event of breach by Tenant, State shall have the following remedies. These remedies are not exclusive; they are cumulative and are in addition to any other right or remedy of State at law or in equity.

Collection of Rent: In any case where State has a cause of action for damages, State shall have the privilege of splitting the cause to permit the institution of a separate suit for royalties due hereunder, and neither institution of any suit, nor the subsequent entry of judgment shall bar State from bringing another suit for royalties; it being the purpose of this provision to provide that the forbearance on the part of State in any suit or entry of judgment for any part of the royalties reserved under this Lease, to sue for, or to include in, any suit and judgment the royalties then due, shall not serve as defense against, nor prejudice a subsequent action for, royalties or other obligations due under the Lease. The claims for royalties may be regarded by State, if it so elects, as separate claims capable of being assigned separately.

Continued Performance: At State's option, Tenant shall continue with its responsibilities under this Lease during any dispute.

Termination of Tenant's Right to Possession: Upon an event of breach of this Lease by Tenant, in addition to any other rights or remedies it may have, State may give Tenant a three-day notice to cure the breach or quit the Lease area. If Tenant fails to do either, State may bring a statutory proceeding in unlawful detainer to regain possession of the Lease area.

Any notice given by State pursuant to this Paragraph does not constitute a termination of this Lease unless expressly so declared by State in the notice. In the absence of written notice from State, no act by State, including, but not limited to, acts of maintenance, efforts to re-let and/or assign rights to possession of the Lease area, or the appointment of a receiver on State's initiative to protect State's interest under this Lease shall constitute an acceptance of Tenant's surrender of the Lease area, or constitute a termination of this Lease or of Tenant's right to possession of the Lease area. Upon such termination, State has the right to recover from Tenant:

(a) The worth, at the time of the award, of the unpaid royalties that had been earned at the time of termination of this Lease;

(b) The worth, at the time of the award, of the amount by which the unpaid royalties that would have been earned after the date of termination of this Lease until the time of the award exceeds the amount of loss of royalties that Tenant proves could have reasonably been avoided;

(c) The worth, at the time of the award, of the amount by which the unpaid royalties for the balance of the term after the time of the award exceeds the amount of the loss of royalties that Tenant proves could have been reasonably avoided; and

(d) Any other amount necessary to compensate State for all the detriment proximately caused by Tenant's failure to perform its obligations under this Lease, and costs of clearing State's title of any interest of Tenant, commissions, attorneys' fees, and any other costs necessary or appropriate to make the Lease area operational by a new Tenant.

"The worth, at the time of the award," as used herein above shall be computed by allowing interest at the lesser of a rate of ten percent (10%) per annum or the maximum legal rate.

Receiver: If Tenant is in breach of this Lease, State shall have the right to have a receiver appointed to collect royalties and conduct Tenant's business or to avail itself of any other pre-judgment remedy. Neither the filing of a petition for the appointment of a receiver nor the appointment itself shall constitute an election by State to terminate this Lease.

Right to Cure Tenant's Breach: At any time after Tenant commits a breach, State can cure the breach at Tenant's cost. If State, at any time by reason of Tenant's breach, pays any sum or does any act that requires the payment of any sum, the sum paid by State shall be due immediately from Tenant to State, and if paid at a later date shall bear interest at the rate of ten percent (10%) per annum from the date the sum is paid by State until State is reimbursed by Tenant.

Personal Property of Tenant: In the event any personal property or trade fixtures of Tenant remain at the Lease area after State has regained possession, that property or those fixtures shall be dealt with in accordance with the provisions for Surrender of the Lease area provided below.

State's Obligations After Breach: State shall be under no obligation to observe or perform any covenant of this Lease on its part to be observed or performed that accrues after the date of any breach by Tenant. Such nonperformance by State shall not constitute a termination of Tenant's right to possession nor a constructive eviction.

No Right of Redemption: Tenant hereby waives its rights under California Code of Civil Procedure sections 1174 and 1179 or any present or future law that allows Tenant any right of redemption or relief from forfeiture in the event State takes possession of the Lease area by reason of any breach by Tenant.

Other Relief: State shall have such rights and remedies for failure to pay any and all monetary obligations under this Lease as State would have if Tenant failed to pay royalties due. The remedies provided in this Lease are in addition to any other remedies available to State at law, in equity, by statute, or otherwise.

Attorney's Fees and Costs: Tenant shall reimburse State on demand for all reasonable attorney fees and expenses incurred by State as a result of a breach under this Lease.

State shall not be in breach of the performance of any obligation required of it under this Lease unless and until it has failed to perform such obligation for more than thirty (30) days after written notice by Tenant to State specifying the alleged breach and the applicable Lease provision giving rise to the obligation. However, if the nature of State's obligation is such that more than thirty (30) days is required for its performance, then State shall not be deemed in breach if it shall commence performance within such 30-day period and thereafter diligently prosecute the same to completion.

25. TERMINATION. In the event the Lease area becomes unsuitable for the commercial harvest of kelp, or in the event the Tenant becomes unable to continue operating the Lease for commercial kelp harvest for reasons beyond Tenant's ability to control, Tenant may terminate the Lease after thirty (30) days written notice to State.

Tenant may terminate the Lease for any other reason through a written request presented to and approved by State at a public hearing held for purposes of consideration of Tenant's termination request. Such termination shall be effective thirty (30) days after State's approval. State may terminate this Lease for any other reason with thirty (30) days written notice to tenant.

On expiration of or within thirty (30) days after earlier termination of the Lease, Tenant shall surrender the Lease area to State. If Tenant fails to surrender the Lease area to State on the expiration, or within thirty (30) days after earlier termination of the term as provided by this Section, Tenant shall hold State harmless for all damages resulting from Tenant's failure to surrender the Lease area.

26. ASSIGNMENT AND SUBLEASES. Pursuant to Fish and Game Code Section 6708, this Lease may not be assigned, in whole or in part, by Tenant, either voluntarily or by operation of law, and no subleases or other rights may be granted under it by Tenant without the prior approval of State, subject to the conditions that it prescribes. At the election of State, any attempted assignment or subletting without the prior approval of State shall terminate this Lease.

27. RELEASE. Tenant shall within 90 days of the expiration or sooner termination of this Lease, execute, acknowledge and deliver to State in a form provided by State, a release of all rights under this Lease. Should Tenant fail or refuse to deliver such a release, a written notice by State reciting such failure or refusal shall, from the date of its recordation, be conclusive evidence against Tenant of the expiration or termination of this Lease.

28. CONSTRUCTION. This Lease contains the entire agreement between the parties. This Lease shall be governed by and construed in accordance with the laws of the State of California. The Paragraph titles in this Lease are inserted only as a matter of convenience and for reference, and in no way define, limit, or describe the scope or intent of this Lease or in any way affect this Lease.

29. WAIVER AND CONSENT. Unless expressly acknowledged by State in writing, no term, covenant, or condition of this Lease and no default or breach is waived by the acceptance of a late or nonconforming performance. State's consent for one transaction or event under this Lease is not consent to any subsequent occurrence of the same or any other transaction or event.

30. TIME OF THE ESSENCE. Time is of the essence of this Lease and any term, covenant or condition in which performance is a factor.

31. CHANGES. Nothing in this Lease may be waived, modified, amended, or discharged except by an instrument in writing signed by Tenant and State.

32. SEVERABILITY. If a court of competent jurisdiction determines that a Lease provision is legally invalid, illegal or unenforceable, and such decision becomes final, the provision shall be severed and deleted from the Lease and the remainder reasonably interpreted to achieve its intent.

Tenant and State agree to replace such void or unenforceable provision with a valid and enforceable provision that will achieve, to the extent possible, the purpose original provision.

33. NO AGENCY. The Tenant, and the agents and employees of the Tenant in the performance of the Lease, shall act in an independent capacity and not as officers or agents of the State of California.

34. CLOSURE. Neither State nor the California Department of Fish and Wildlife shall have any liability arising from a closure of waters by the California Department of Fish and Wildlife Director pursuant to Fish and Game Code Section 5654, where kelp harvesting operations are taking place in accordance with this Lease.

35. COUNTERPARTS. This Lease may be executed in counterparts, each of which shall be deemed to be an original, but all of which, taken together, shall constitute one and the same Agreement. The exchange of copies of this Lease and of signature pages by electronic mail in "portable document format" ("pdf") form or by any other electronic means shall constitute effective execution and delivery of this Lease, as long as the original signatures will follow in the mail.

36. APPROVAL. This Lease, and any renewal of it, is subject to approval by the State of California, Department of General Services.

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SIGNATURE PAGE

Each signatory attests he or she is duly authorized to execute this Lease on behalf of the principal he or she represents.

STATE OF CALIFORNIA:

CALIFORNIA FISH AND GAME COMMISSION

By: Melissa A. Miller-Henson
MELISSA MILLER-HENSON
Acting Executive Director

Date: 7/5/19

TENANT:

KNOCEAN Sciences, Inc.

By: Tony Copp
Tony Copp
Chief Executive Officer

Date: 6/19/2019

CONSENT TO LEASE AND APPROVES OF TERMS:

DIRECTOR OF CALIFORNIA DEPARTMENT
OF GENERAL SERVICES

By: Tony Psihopaidas
TONY PSIHOPAIDAS, Manager
State Owned Leasing & Development

Date: 7/11/19

Maxey, Samara@Wildlife

From: tcopp <tcopp@knoceansciences.com>
Sent: Wednesday, July 22, 2020 2:45 PM
To: Flores Miller, Rebecca@Wildlife; Chouinard, Brian
Subject: RE: giant kelp harvest out of leased kelp bed 3

Warning: This email originated from outside of CDFW and should be treated with extra caution.

Dear Rebecca,

As CEO of KNOCEAN Sciences, Inc. I approve SeaWorld's request to harvest for their stated purpose on our Kelp Lease Bed at Point Loma, 3 and under their SCP.

Sincerely,

Tony Copp

Sent via the Samsung Galaxy S7, an AT&T 4G LTE smartphone

-------- Original message --------
From: "Flores Miller, Rebecca@Wildlife" <Rebecca.FloresMiller@wildlife.ca.gov>
Date: 7/22/20 4:33 PM (GMT-06:00)
To: "Chouinard, Brian" <Brian.Chouinard@SeaWorld.com>, Tony Copp <tcopp@knoceansciences.com>
Subject: RE: giant kelp harvest out of leased kelp bed 3

Hi Tony,

Brian confirmed Sea World's request for giant kelp take out of leased bed 3 (see below email string) under their Scientific Collecting Permit.

Please let me know if this is or is not agreeable. If you approve I will move forward with drafting the request to the Fish and Game Commission for allowance out of the leased bed. Because this is a scientific collecting permit (SCP) request and not a commercial venture any take would be also need to be approved under the SCP. There is no reporting or fees other than what is stipulated during the SCP process.

Let me know if you have any questions.

Thanks.

Rebecca Flores Miller

Nearshore and Bay Management Project

California Department of Fish and Wildlife

831-649-2835

From: Chouinard, Brian <Brian.Chouinard@SeaWorld.com>
Sent: Tuesday, July 21, 2020 2:11 PM
To: Flores Miller, Rebecca@Wildlife <Rebecca.FloresMiller@wildlife.ca.gov>
Subject: RE: giant kelp harvest out of leased kelp bed 3

Warning: This email originated from outside of CDFW and should be treated with extra caution.

Rebecca,

Thank you for all your help concerning this matter. It has been a good learning experience for us in how we fit into the bigger picture of CA's natural resources. The statement looks good to me. Below you will find the explanations for enrichment and animal welfare.

Examples of why collecting and supplying fresh kelp from the kelp beds impact our collection's enrichment and animal welfare include unique natural environment enrichment for our pinnipeds, cetaceans, fish, and invertebrates while also supplying several of our invertebrate species with a natural diet rather than an artificially produce commercial feed. These aspects are key to our animal welfare best practices and elevate our animal collection's overall wellbeing.

Brian Chouinard | Fish Department Supervisor, Zoological Operations

500 SeaWorld Drive | San Diego | CA 92109

brian.chouinard@seaworld.com | office 619 226 3900 x2464, cell 619 394 6708

From: Flores Miller, Rebecca@Wildlife [mailto:Rebecca.FloresMiller@wildlife.ca.gov]
Sent: Monday, July 20, 2020 12:43 PM
To: Chouinard, Brian
Subject: [EXTERNAL] giant kelp harvest out of leased kelp bed 3

Hi Brian,

I spoke with Tony Copp with KNOCEAN. In order to move forward I would like to confirm what Sea World is requesting under your Scientific Collecting Permit for giant kelp removal out of leased administrative kelp bed 3. Please confirm or correct as needed:

We would like to collect kelp from leased bed #3 since it decreases labor time needed to collect, increases safety during collection, and allows for shorter more consistent collecting which improves animal welfare. For us to travel south to the kelp beds at the end of Point Loma/past Point Loma (zone 2 & 1) that adds an additional 2-2.5 hours to trip depending on weather conditions. Were as collecting from Leased zone 3 has a collection time of about 1 hour. That makes a big difference in labor resources for our animal care staff. Collecting north into zone 4 in between the SMR's presents safety challenges due to heavy surf and swell breaking over shale reefs, plus an additional 0.75-1hr travel time. So what collecting from Zone 3 allows for us is more consistent collecting with less resources which provide more uniform supply of food resources and enrichment for our animal collection

- We would be collecting under the conditions stated in permit which is fronds only using 4ft protocol
- For our enrichment and welfare needs we would collect 40-50lbs/month with a weekly collection schedule (10-12lbs/week). This would be ongoing through time of permit to support animal food and enrichment needs

Please provide a sentence or two explaining "…enrichment and welfare needs…"

Thank you.

Rebecca

Rebecca Flores Miller

Nearshore and Bay Management Project

California Department of Fish and Wildlife

831-649-2835

Department of Fish & Wildlife Legislative Report

October 2020

(as of October 1, 2020)

AB 6
(Reyes D) Attorney General: duties.
Introduced: 12/3/2018
Last Amend: 8/27/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. BUDGET & F.R. on 8/28/2020)
Location: 8/31/2020-S. DEAD
Summary: The California Constitution exempts from state civil service various types of officers and employees, including officers elected by the people and a deputy and an employee selected by each of those officers. The California Constitution additionally authorizes the Attorney General to appoint or employ 6 deputies or 6 employees who are exempt from state civil service. Under existing law, the Governor, with the recommendation of the Attorney General, is required to appoint 2 directors and 2 associate directors of the Attorney General's office who would be exempt from state civil service. This bill would instead require the Governor, with the recommendation of the Attorney General, to appoint 6 directors and 6 associate directors of the Attorney General's office who are exempt from state civil service.

AB 44
(Friedman D) Fur products: prohibition.
Introduced: 12/3/2018
Last Amend: 9/6/2019
Status: 10/12/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 764, Statutes of 2019.
Location: 10/12/2019-A. CHAPTERED
Summary: Would make it unlawful to sell, offer for sale, display for sale, trade, or otherwise distribute for monetary or nonmonetary consideration a fur product, as defined, in the state. The bill would also make it unlawful to manufacture a fur product in the state for sale. The bill would exempt from these prohibitions used fur products, as defined, fur products used for specified purposes, and any activity expressly authorized by federal law. The bill would require a person that sells or trades any fur product exempt from this prohibition to maintain records of each sale or trade of an exempt fur product for at least one year, except as provided.

AB 202
(Mathis R) Endangered species: conservation: California State Safe Harbor Agreement Program Act.
Introduced: 1/14/2019

Last Amend: 2/26/2019
Status: 8/18/2020-Failed Deadline pursuant to Rule 61(b)(13). (Last location was N.R. & W. on 4/24/2019)
Location: 8/18/2020-S. DEAD
Summary: Would delete the January 1, 2020, repeal date of the California State Safe Harbor Agreement Program Act, thereby extending the operation of the act indefinitely. Because submission of false, inaccurate, or misleading information on an application for a state safe harbor agreement under the act would be a crime, this bill would extend the application of a crime, thus imposing a state-mandated local program.

AB 231
(Mathis R) California Environmental Quality Act: exemption: recycled water.
Introduced: 1/17/2019
Status: 1/17/2020-Failed Deadline pursuant to Rule 61(b)(1). (Last location was 2 YEAR on 2/7/2019)
Location: 1/17/2020-A. DEAD
Summary: Would exempt from CEQA a project to construct or expand a recycled water pipeline for the purpose of mitigating drought conditions for which a state of emergency was proclaimed by the Governor if the project meets specified criteria. Because a lead agency would be required to determine if a project qualifies for this exemption, this bill would impose a state-mandated local program. The bill would also exempt from CEQA the development and approval of building standards by state agencies for recycled water systems.

AB 235
(Mayes I) Endangered species: candidate species: petitions: takings.
Introduced: 1/18/2019
Last Amend: 6/29/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. N.R. & W. on 7/2/2020)
Location: 8/31/2020-S. DEAD
Summary: The California Endangered Species Act requires the Fish and Game Commission to establish a list of endangered species and a list of threatened species and to add a species to, or remove a species from, either list if it finds, upon the receipt of sufficient scientific information, and based solely upon the best available scientific information, that the action is warranted. The act requires a petition for the listing or delisting of a species to include, at a minimum, sufficient scientific information that the petitioned action may be warranted, including information regarding the population trend, range, distribution, abundance, and life history of the species, the factors affecting the ability of the population to survive and reproduce, and the degree and immediacy of the threat. This bill would require the commission to accept a petition for consideration concurrent with a taking if the commission finds that the petition provides sufficient information to indicate that the petitioned action may be warranted, but the geographic proliferation of the species may lead to significant economic hardship or an impact on critical infrastructure during the above-described review of an accepted petition, and if a preponderance of the evidence presented in the petition shows there is no direct threat to the species that would lead to its decline during that period.

AB 243
(Kamlager-Dove D) Implicit bias training: peace officers.
Introduced: 1/18/2019
Last Amend: 4/22/2019
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was S. 2 YEAR on 8/30/2019)
Location: 8/21/2020-S. DEAD
Summary: Current law requires every peace officer to participate in expanded training prescribed by the Commission on Peace Officer Standards and Training that includes and examines evidence-based patterns, practices, and protocols that make up racial and identity profiling, including implicit bias. Once basic training is completed, current law requires specified peace officers to complete a refresher course on racial and identity profiling at least every 5 years. This bill would require those peace officers currently required to take the refresher course every 5 years, and additional peace officers, as specified, to instead take refresher training on racial and identity profiling, including the understanding of implicit bias and the promotion of bias-reducing strategies, at least every 2 years.

AB 255
(Limón D) Coastal resources: oil spills: grants.
Introduced: 1/23/2019
Status: 7/12/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 84, Statutes of 2019.
Location: 7/12/2019-A. CHAPTERED
Summary: The Lempert-Keene-Seastrand Oil Spill Prevention and Response Act authorizes the administrator for oil spill response to offer grants to a local government with jurisdiction over or directly adjacent to waters of the state to provide oil spill response equipment to be deployed by a certified local spill response manager, as provided. This bill would provide that Native American tribes and other public entities are also eligible to receive those grants.

AB 256
(Aguiar-Curry D) Wildlife: California Winter Rice Habitat Incentive Program.
Introduced: 1/23/2019
Last Amend: 9/3/2019
Status: 10/2/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 420, Statutes of 2019.
Location: 10/2/2019-A. CHAPTERED
Summary: Current law requires the lessees of the rice lands to have the owners of record execute the contracts and defines “productive agricultural rice lands that are winter-flooded” for these purposes. Current law requires each contract to include, among other things, an agreement by the owner and any lessee to restore, enhance, and protect the waterfowl habitat character of the described land. This bill would no longer require the lessees of the rice lands to have the owners of record execute the contracts and would revise the definition of “productive agricultural rice lands that are winter-flooded.” The bill would revise that agreement to instead require an agreement by the owner or the lessee to restore, enhance, and protect the waterfowl habitat character of an established number of acres of described land that may be annually

rotated provided that the minimum contracted acreage amount is achieved for each of the contracted winter flooding seasons.

AB 273
(Gonzalez D) Fur-bearing and nongame mammals: recreational and commercial fur trapping: prohibition.
Introduced: 1/24/2019
Last Amend: 3/5/2019
Status: 9/4/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 216, Statutes of 2019.
Location: 9/4/2019-A. CHAPTERED
Summary: Would prohibit the trapping of any fur-bearing mammal or nongame mammal for purposes of recreation or commerce in fur and would prohibit the sale of the raw fur of any fur-bearing mammal or nongame mammal otherwise lawfully taken pursuant to the Fish and Game Code or regulations adopted pursuant to that code. Because a violation of these provisions would be a crime, this bill would impose a state-mandated local program. The bill would also make other conforming changes.

AB 284
(Frazier D) Junior hunting licenses: eligibility: age requirement.
Introduced: 1/28/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/24/2020-A. DEAD
Summary: Current law requires the Department of Fish and Wildlife to issue various types of hunting licenses, including a discounted hunting license known as a junior hunting license, upon payment of a certain fee from an eligible applicant. Current law, until July 1, 2020, expands the eligibility for a junior hunting license from persons who are under 16 years of age on July 1 of the licensing year to persons who are under 18 years of age on July 1 of the licensing year, as specified, and makes conforming changes related to that expanded eligibility. This bill would extend, this expanded eligibility, for a junior hunting license indefinitely.

AB 286
(Bonta D) Taxation: cannabis.
Introduced: 1/28/2019
Last Amend: 4/3/2019
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. DEAD on 1/31/2020)
Location: 8/31/2020-A. DEAD
Summary: The Control, Regulate and Tax Adult Use of Marijuana Act imposes duties on the Bureau of Cannabis Control in the Department of Consumer Affairs, the Department of Food and Agriculture, and the State Department of Public Health with respect to the creation, issuance, denial, suspension and revocation of commercial cannabis licenses, and imposes an excise tax commencing January 1, 2018, on the purchase of cannabis and cannabis products at the rate of 15% of the average market price of any retail sale by a cannabis retailer. Commencing January 1, 2018, AUMA also imposes a cultivation tax upon all cultivators on all harvested cannabis that enters the commercial market, at specified rates per dry-weight ounce of cannabis flowers and

leaves. This bill would reduce that excise tax rate to 11% on and after the operative date of this bill until July 1, 2022, at which time the excise tax rate would revert back to 15%.

AB 298
(Mathis R) Housing: home purchase assistance program: first responders: Legislative Analyst: study and report.
Introduced: 1/28/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/24/2020-A. DEAD
Summary: Would require the Legislative Analyst to conduct a study, and present the findings thereof to the Legislature, to inform the creation of a low-interest loan program for first responders. The bill would require the report to be submitted on or before January 1, 2024. The bill would require the report to include a recommendation as to which state department is best suited to administer the program, an estimation of the amount of funding that would be necessary to conduct the program, and recommendations for qualifications for participation in the program.

AB 312
(Cooley D) State government: administrative regulations: review.
Introduced: 1/29/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/24/2020-A. DEAD
Summary: Would require each state agency to, on or before January 1, 2022, review its regulations, identify any regulations that are duplicative, overlapping, inconsistent, or out of date, revise those identified regulations, as provided, and report its findings and actions taken to the Legislature and Governor, as specified. The bill would repeal these provisions on January 1, 2023.

AB 352
(Garcia, Eduardo D) Wildfire Prevention, Safe Drinking Water, Drought Preparation, and Flood Protection Bond Act of 2020.
Introduced: 2/4/2019
Last Amend: 8/14/2019
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. E.Q. on 8/14/2019)
Location: 8/31/2020-S. DEAD
Summary: Would enact the Wildfire Prevention, Safe Drinking Water, Drought Preparation, and Flood Protection Bond Act of 2020, which, if approved by the voters, would authorize the issuance of bonds in the amount of $3,920,000,000 pursuant to the State General Obligation Bond Law to finance a wildlife prevention, safe drinking water, drought preparation, and flood protection program. The bill would provide for the submission of these provisions to the voters at the November 3, 2020, statewide general election. The bill would provide that its provisions are severable.

AB 392
(Weber D) Peace officers: deadly force.
Introduced: 2/6/2019
Last Amend: 5/23/2019

Status: 8/19/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 170, Statutes of 2019.
Location: 8/19/2019-A. CHAPTERED
Summary: Would redefine the circumstances under which a homicide by a peace officer is deemed justifiable to include when the officer reasonably believes, based on the totality of the circumstances, that deadly force is necessary to defend against an imminent threat of death or serious bodily injury to the officer or to another person, or to apprehend a fleeing person for a felony that threatened or resulted in death or serious bodily injury, if the officer reasonably believes that the person will cause death or serious bodily injury to another unless the person is immediately apprehended.

AB 394
(Obernolte R) California Environmental Quality Act: exemption: egress route projects: fire safety.
Introduced: 2/6/2019
Last Amend: 9/6/2019
Status: 1/21/2020-Consideration of Governor's veto stricken from file.
Location: 10/2/2019-A. VETOED
Summary: Would, until January 1, 2025, exempt from CEQA egress route projects undertaken by a public agency that are specifically recommended by the State Board of Forestry and Fire Protection that improve the fire safety of an existing subdivision if certain conditions are met. The bill would require the lead agency to hold a noticed public meeting to hear and respond to public comments before determining that a project is exempt. The bill would require the lead agency, if it determines that a project is not subject to CEQA and approves or carries out that project, to file a notice of exemption with the Office of Planning and Research and with the clerk of the county in which the project will be located.

AB 430
(Gallagher R) Housing development: Camp Fire Housing Assistance Act of 2019.
Introduced: 2/7/2019
Last Amend: 8/27/2019
Status: 10/11/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 745, Statutes of 2019.
Location: 10/11/2019-A. CHAPTERED
Summary: Current law authorizes a development proponent to submit an application for a development permit that is subject to a streamlined, ministerial approval process and not subject to a conditional use permit if the development satisfies specified objective planning standards, including that the development is a multifamily housing development that contains 2 or more residential units. This bill would authorize a development proponent to submit an application for a residential development, or mixed-use development that includes residential units with a specified percentage of space designated for residential use, within the territorial boundaries or a specialized residential planning area identified in the general plan of, and adjacent to existing urban development within, specified cities that is subject to a similar streamlined, ministerial approval process and not subject to a conditional use permit if the development satisfies specified objective planning standards.

AB 431
(Gallagher R) California Environmental Quality Act: exemptions: projects in Town of Paradise and Butte County.
Introduced: 2/7/2019
Last Amend: 3/19/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/17/2020-A. DEAD
Summary: Would exempt from CEQA projects or activities related to the provision of sewer treatment or water service to the Town of Paradise or related to the improvement of evacuation routes in the Town of Paradise. The bill would also exempt from CEQA projects or activities undertaken by the Paradise Irrigation District related to the provision of water service.

AB 441
(Eggman D) Water: underground storage.
Introduced: 2/11/2019
Last Amend: 3/27/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/24/2020-A. DEAD
Summary: Under current law, the right to water or to the use of water is limited to that amount of water that may be reasonably required for the beneficial use to be served. Current law provides for the reversion of water rights to which a person is entitled when the person fails to beneficially use the water for a period of 5 years. Current law declares that the storing of water underground, and related diversions for that purpose, constitute a beneficial use of water if the stored water is thereafter applied to the beneficial purposes for which the appropriation for storage was made. This bill would instead provide that any diversion of water to underground storage constitutes a diversion of water for beneficial use for which an appropriation may be made if the diverted water is put to beneficial use, as specified.

AB 448
(Garcia, Eduardo D) Water rights: stockponds.
Introduced: 2/11/2019
Last Amend: 4/3/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/24/2020-A. DEAD
Summary: Would provide that the owner of a stockpond built prior to January 1, 2019, that does not have a capacity greater than 10 acre-feet may obtain a right to appropriate water for the principal purpose of watering livestock if that person files a claim for a water right with the State Water Resources Control Board accompanied by a fee not later than December 31, 2021, with certain exceptions. Upon the issuance of a certificate by the board for an appropriation of water obtained under the bill's provisions, the bill would require the board to provide in writing conditions to which the appropriation is subject.

AB 454
(Kalra D) Migratory birds: California Migratory Bird Protection Act.
Introduced: 2/11/2019

Last Amend: 5/16/2019
Status: 9/27/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 349, Statutes of 2019.
Location: 9/27/2019-A. CHAPTERED
Summary: Current federal law, the Migratory Bird Treaty Act, provides for the protection of migratory birds, as specified. The federal act also authorizes states and territories of the United States to make and enforce laws or regulations that give further protection to migratory birds, their nests, and eggs. Current state law makes unlawful the taking or possession of any migratory nongame bird, or part of any migratory nongame bird, as designated in the federal act, except as provided by rules and regulations adopted by the United States Secretary of the Interior under provisions of the federal act. This bill, the California Migratory Bird Protection Act, would instead, until January 20, 2025, make unlawful the taking or possession of any migratory nongame bird designated in the federal act before January 1, 2017, any additional migratory nongame bird that may be designated in the federal act after that date, or any part of those migratory nongame birds, except as provided by rules and regulations adopted by the United States Secretary of the Interior under the federal act before January 1, 2017, or subsequent rules or regulations adopted pursuant to the federal act, unless those rules or regulations are inconsistent with the Fish and Game Code.

AB 467
(Boerner Horvath D) Competitions on state property: prize compensation: gender equity.
Introduced: 2/11/2019
Last Amend: 6/14/2019
Status: 9/9/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 276, Statutes of 2019.
Location: 9/9/2019-A. CHAPTERED
Summary: Would require the Department of Parks and Recreation, the State Lands Commission and the California Coastal Commission to include in permit or lease conditions, for a competition event to be held on land under the jurisdiction of the entity, as described, and that awards prize compensation, as defined, to competitors in gendered categories, a requirement that the prize compensation be identical between the gendered categories at each participant level.

AB 527
(Voepel R) Importation, possession, or sale of endangered wildlife.
Introduced: 2/13/2019
Last Amend: 4/22/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/31/2020-A. DEAD
Summary: Would delay the commencement of the prohibition on importing into the state for commercial purposes, possessing with intent to sell, or selling within the state, the dead body, or a part or product thereof, of a crocodile or alligator until January 1, 2030. The bill would also require a specified disclosure on all products sold in the state prior to January 1, 2030, failure to do so being punishable as a misdemeanor. By creating a new crime, this bill would impose a state-mandated local program.

AB 559
(Arambula D) Millerton Lake State Recreation Area: acquisition of land.
Introduced: 2/13/2019
Status: 8/18/2020-Failed Deadline pursuant to Rule 61(b)(13). (Last location was S. N.R. & W. on 6/23/2020)
Location: 8/18/2020-S. DEAD
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 conservancy adjacent to the state recreation area, as specified.

AB 609
(Levine D) California Environmental Quality Act: notices and documents: electronic filing and posting.
Introduced: 2/14/2019
Last Amend: 6/23/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. E.Q. on 7/1/2020)
Location: 8/31/2020-S. DEAD
Summary: The California Environmental Quality Act requires a lead agency to prepare a mitigated negative declaration for a project that may have a significant effect on the environment if revisions in the project would avoid or mitigate that effect and there is no substantial evidence that the project, as revised, would have a significant effect on the environment. The act requires the lead agency to mail certain notices to persons who have filed a written request for notices. This bill would require the lead agency and the project applicant to post those notices on their internet website.

AB 658
(Arambula D) Water rights: water management.
Introduced: 2/15/2019
Last Amend: 7/11/2019
Status: 10/9/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 678, Statutes of 2019.
Location: 10/9/2019-A. CHAPTERED
Summary: Would authorize a groundwater sustainability agency or local agency to apply for, and the board to issue, a conditional temporary permit for diversion of surface water to underground storage for beneficial use that advances the sustainability goal of a groundwater basin, as specified.

AB 664
(Cooper D) Workers' compensation: injury: COVID-19.
Introduced: 2/15/2019
Last Amend: 8/25/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. THIRD READING on 8/26/2020)
Location: 8/31/2020-S. DEAD
Summary: Current law imposes a duty on an employer to provide certain safety

materials and adopt safety practices as necessary. A failure to meet this duty, under specified circumstances, is a misdemeanorWould, until July 1, 2024, define “injury,” for certain state and local firefighting personnel, peace officers, certain correctional and law enforcement personnel, as described, certain health care employees who provide direct patient care at an acute care hospital, and certain fire and rescue services coordinators who work for the Office of Emergency Services to include illness or death resulting from COVID-19, that is diagnosed on or after January 1, 2020, if certain circumstances apply.

AB 719
(Rubio, Blanca D) Endangered wildlife: crocodiles and alligators.
Introduced: 2/19/2019
Last Amend: 8/13/2019
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was S. 2 YEAR on 8/30/2019)
Location: 8/21/2020-S. DEAD
Summary: Current law makes it a misdemeanor to import into the state for commercial purposes, to possess with intent to sell, or to sell within the state, the dead body, or a part or product thereof, of a polar bear, leopard, ocelot, tiger, cheetah, jaguar, sable antelope, wolf, zebra, whale, cobra, python, sea turtle, colobus monkey, kangaroo, vicuna, sea otter, free-roaming feral horse, dolphin, porpoise, Spanish lynx, or elephant. This bill would require manufacturers of products that use the hides of crocodiles or alligators, after consultation with the Department of Fish and Wildlife, to submit to the Director of Fish and Wildlife proposals for technologies or processes that allow for the tracking or tracing of the source of origin of crocodile or alligator hides used to manufacture products sold in this state and require humane treatment of farmed crocodiles and alligators, as well as humane slaughtering techniques. The bill would require the director, on or before March 30, 2021, to approve technologies or processes that meet those requirements.

AB 782
(Berman D) California Environmental Quality Act: exemption: public agencies: land transfers.
Introduced: 2/19/2019
Last Amend: 5/28/2019
Status: 8/30/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 181, Statutes of 2019.
Location: 8/30/2019-A. CHAPTERED
Summary: CEQA requires a lead agency to prepare a mitigated negative declaration for a project that may have a significant effect on the environment if revisions in the project would avoid or mitigate that effect and there is no substantial evidence that the project, as revised, would have a significant effect on the environment. This bill ould exempt from CEQA the acquisition, sale, or other transfer of interest in land by a public agency for certain purposes, or the granting or acceptance of funding by a public agency for those purposes.

AB 834
(Quirk D) Freshwater and Estuarine Harmful Algal Bloom Program.
Introduced: 2/20/2019

Last Amend: 8/30/2019
Status: 9/27/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 354, Statutes of 2019.
Location: 9/27/2019-A. CHAPTERED
Summary: Would require the State Water Resources Control Board to establish a Freshwater and Estuarine Harmful Algal Bloom Program to protect water quality and public health from harmful algal blooms. The bill would require the state board, in consultation with specified entities, among other things, to coordinate immediate and long-term algal bloom event incident response, as provided, and conduct and support algal bloom field assessment and ambient monitoring at the state, regional, watershed, and site-specific waterbody scales.

AB 883
(Dahle R) Fish and wildlife: catastrophic wildfires: report.
Introduced: 2/20/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/24/2020-A. DEAD
Summary: Would require the Department of Fish and Wildlife, in consultation with the Department of Forestry and Fire Protection, on or before December 31, 2020, and by December 31 each year thereafter, to study, investigate, and report to the Legislature on the impacts on wildlife and wildlife habitat resulting from any catastrophic wildfire, as defined, that occurred during that calendar year, including specified information on a catastrophic wildfire's impact on ecosystems, biodiversity, and protected species in the state.

AB 889
(Maienschein D) Animal research.
Introduced: 2/20/2019
Last Amend: 4/1/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/17/2020-A. DEAD
Summary: Current law prohibits the keeping or use of animals for diagnostic purposes, education, or research without approval by the State Department of Public Health. Current law authorizes the department to prescribe rules under which persons who wish to keep or use animals for those purposes may obtain approval from the department, and to promulgate regulations governing the use of animals for those purposes. Current law exempts certain persons from those requirements, including persons who use or keep animals for animal training and animal cosmetics, among other things. This bill would define "animal" for purposes of these provisions as any live vertebrate nonhuman animal used for diagnostic purposes, education, or research, as specified.

AB 935
(Rivas, Robert D) Oil and gas: facilities and operations: monitoring and reporting.
Introduced: 2/20/2019
Last Amend: 3/21/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/17/2020-A. DEAD
Summary: Under current law, the Division of Oil, Gas, and Geothermal Resources in

the Department of Conservation regulates the drilling, operation, maintenance, and abandonment of oil and gas wells in the state. Current law defines various terms for those purposes, including “production facility. This bill ”Would define the term “sensitive production facility” for those purposes to mean a production facility that is located within certain areas, including, among others, an area containing a building intended for human occupancy that is located within 2,500 feet of the production facility.

AB 936
(Rivas, Robert D) Oil spills: response and contingency planning.
Introduced: 2/20/2019
Last Amend: 9/6/2019
Status: 10/12/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 770, Statutes of 2019.
Location: 10/12/2019-A. CHAPTERED
Summary: Would define “nonfloating oil” for purposes of the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act. The bill would require the administrator to hold, on or before January 1, 2022, a technology workshop that shall include the topic of technology for addressing nonfloating oil spills, and, in fulfilling specified duties, to consider information gained from technology workshops, as well as available scientific and technical literature concerning nonfloating oil spill response technology. The bill would require the administrator to include in the revision to the California oil spill contingency plan due on or before January 1, 2023, provisions addressing nonfloating oil.

AB 948
(Kalra D) Coyote Valley Conservation Program.
Introduced: 2/20/2019
Last Amend: 8/12/2019
Status: 9/27/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 356, Statutes of 2019.
Location: 9/27/2019-A. CHAPTERED
Summary: Current law creates the Santa Clara Valley Open-Space Authority, and prescribes the jurisdiction and functions and duties of the authority. Current law authorizes the authority, among other things, to acquire, hold, and dispose of real and personal property, within the authority’s jurisdiction, necessary to the full exercise of its powers. This bill would authorize the authority to establish and administer the Coyote Valley Conservation Program to address resource and recreational goals of the Coyote Valley, as defined. The bill would authorize the authority to collaborate with state, regional, and local partners to help achieve specified goals of the program. The bill would authorize the authority to, among other things, acquire and dispose of interests and options in real property.

AB 1013
(Obernolte R) State agencies: grant applications.
Introduced: 2/21/2019
Last Amend: 8/20/2019
Status: 10/3/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 498, Statutes of 2019.

Location: 10/3/2019-A. CHAPTERED
Summary: Current law authorizes various state agencies to award grant money for various purposes. This bill would prohibit a state agency from permitting an evaluator to review a discretionary grant application submitted by an organization or a person for which the evaluator was a representative, voting member, or staff member within the 2-year period preceding receipt of that application.

AB 1022
(Holden D) Peace officers: use of force.
Introduced: 2/21/2019
Last Amend: 7/30/2020
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was S. APPR. SUSPENSE FILE on 8/17/2020)
Location: 8/21/2020-S. DEAD
Summary: Current law requires each law enforcement agency, on or before January 1, 2021, to maintain a policy that provides a minimum standard on the use of force. Current law requires that policy, among other things, to require that officers report potential excessive force to a superior officer when present and observing another officer using force that the officer believes to be unnecessary, and to require that officers intercede when present and observing another officer using force that is clearly beyond that which is necessary, as specified. This bill would require those law enforcement policies to require those officers to immediately report potential excessive force, and to intercede when present and observing an officer using excessive force, as defined.

AB 1040
(Muratsuchi D) Protection of cetaceans: unlawful activities.
Introduced: 2/21/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/17/2020-A. DEAD
Summary: Current law makes it unlawful to hold in captivity an orca, whether wild caught or captive bred, for any purpose, including for display, performance, or entertainment purposes; to breed or impregnate an orca held in captivity; to export, collect, or import the semen, other gametes, or embryos of an orca held in captivity for the purpose of artificial insemination; or to export, transport, move, or sell an orca located in the state to another state or country. Current law creates certain exceptions to these provisions, including an exception that authorizes an orca located in the state on January 1, 2017, to continue to be held in captivity for its current purpose and, after June 1, 2017, to continue to be used for educational presentations. This bill would expand these provisions to include cetaceans, which the bill would define to mean a whale, dolphin, and porpoise in the order Cetacea.

AB 1117
(Grayson D) Peace officers: peer support.
Introduced: 2/21/2019
Last Amend: 9/6/2019
Status: 10/8/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 621, Statutes of 2019.

Location: 10/8/2019-A. CHAPTERED
Summary: The California Emergency Services Act also authorizes the governing body of a city, county, city and county, or an official designated by ordinance adopted by that governing body, to proclaim a local emergency, as defined. This bill would enact the Law Enforcement Peer Support and Crisis Referral Services Program. The bill would authorize a local or regional law enforcement agency to establish a peer support and crisis referral program to provide an agencywide network of peer representatives available to aid fellow employees on emotional or professional issues. The bill would, for purposes of the act, define a "peer support team" as a team composed of law enforcement personnel, as defined, who have completed a peer support training course, as specified.

AB 1149
(Fong R) California Environmental Quality Act: record of proceedings.
Introduced: 2/21/2019
Last Amend: 4/23/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/17/2020-A. DEAD
Summary: CEQA requires a lead agency to prepare a mitigated negative declaration for a project that may have a significant effect on the environment if revisions in the project would avoid or mitigate that effect and there is no substantial evidence that the project, as revised, would have a significant effect on the environment. In an action or proceeding alleging the lead agency violated the act, the act requires the lead agency to prepare and certify the record of proceedings and requires the parties to pay any reasonable costs or fees imposed for the preparation of the record of proceedings, as specified.

AB 1160
(Dahle R) Forestry: timber operations: sustained yield plans.
Introduced: 2/21/2019
Last Amend: 4/11/2019
Status: 7/12/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 108, Statutes of 2019.
Location: 7/12/2019-A. CHAPTERED
Summary: The Z'berg-Nejedly Forest Practice Act of 1973 prohibits a person from conducting timber operations, as defined, unless a timber harvesting plan prepared by a registered professional forester has been submitted to, and approved by, the Department of Forestry and Fire Protection. The act requires the State Board of Forestry and Fire Protection to adopt district forest practice rules and regulations, as provided, and requires a sustained yield plan that is prepared and approved in accordance with these rules and regulations to be effective for a period of no more than 10 years. This bill would instead require the sustained yield plan to be effective for a period of no more than 20 years.

AB 1184
(Gloria D) Public records: writing transmitted by electronic mail: retention.
Introduced: 2/21/2019
Last Amend: 8/30/2019

Status: 1/21/2020-Consideration of Governor's veto stricken from file.
Location: 10/13/2019-A. VETOED
Summary: Would, unless a longer retention period is required by statute or regulation, or established by the Secretary of State pursuant to the State Records Management Act, require a public agency, for purposes of the California Public Records Act, to retain and preserve for at least 2 years every public record, as defined, that is transmitted by electronic mail.

AB 1190
(Irwin D) Unmanned aircraft: state and local regulation: limitations.
Introduced: 2/21/2019
Last Amend: 5/1/2019
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 5/24/2019)
Location: 8/31/2020-S. DEAD
Summary: Would, among other things, prohibit a state or local agency from adopting any law or regulation that bans the operation of an unmanned aircraft system. The bill would also authorize a local agency to adopt regulations to enforce FAA regulations regarding the operation of unmanned aircraft systems and would authorize local agencies to regulate the operation of unmanned aircraft and unmanned aircraft systems within their jurisdictions, as specified. The bill would also authorize a local agency to require an unmanned aircraft operator to provide proof of federal, state, or local registration to licensing or enforcement officials.

AB 1197
(Santiago D) California Environmental Quality Act: exemption: City of Los Angeles: supportive housing and emergency shelters.
Introduced: 2/21/2019
Last Amend: 9/6/2019
Status: 9/26/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 340, Statutes of 2019.
Location: 9/26/2019-A. CHAPTERED
Summary: The California Environmental Quality Act (CEQA) requires a lead agency, as defined, to prepare, or cause to be prepared, and certify the completion of an environmental impact report on a project that it proposes to carry out or approve that may have a significant effect on the environment or to adopt a negative declaration if it finds that the project will not have that effect. CEQA also requires a lead agency to prepare a mitigated negative declaration for a project that may have a significant effect on the environment if revisions in the project would avoid or mitigate that effect and there is no substantial evidence that the project, as revised, would have a significant effect on the environment. This bill would, until January 1, 2025, exempt from the requirements of CEQA certain activities approved or carried out by the City of Los Angeles and other eligible public agencies, as defined, related to supportive housing and emergency shelters, as defined.

AB 1237
(Aguiar-Curry D) Greenhouse Gas Reduction Fund: guidelines.
Introduced: 2/21/2019

Last Amend: 8/13/2019
Status: 9/27/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 357, Statutes of 2019.
Location: 9/27/2019-A. CHAPTERED
Summary: Current law requires the Department of Finance to annually submit a report to the appropriate committees of the Legislature on the status of the projects funded with moneys from the Greenhouse Gas Reduction Fund. This bill, no later than January 1, 2021, would require an agency that receives an appropriation from the Greenhouse Gas Reduction Fund to post on the internet website of the agency's program from which moneys from the fund are being allocated the guidelines, as specified, for how moneys from the fund are allocated for competitive financing programs, as specified.

AB 1244
(Fong R) Environmental quality: judicial review: housing projects.
Introduced: 2/21/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/24/2020-A. DEAD
Summary: Would, in an action or proceeding seeking judicial review under the California Environmental Quality Act, prohibit a court from staying or enjoining a housing project for which an environmental impact report has been certified, unless the court makes specified findings.

AB 1254
(Kamlager-Dove D) Bobcats: take prohibition: hunting season: management plan.
Introduced: 2/21/2019
Last Amend: 9/5/2019
Status: 10/12/2019-Approved by the Governor. Chaptered by Secretary of State - Chapter 766, Statutes of 2019.
Location: 10/12/2019-A. CHAPTERED
Summary: Current law authorizes nongame mammals, among other specified species, that are found to be injuring growing crops or other property to be taken at any time or in any manner by specified persons in accordance with the Fish and Game Code and regulations adopted pursuant to that code. Current law authorizes the department to enter into cooperative agreements with any state or federal agency for the purpose of controlling harmful nongame mammals. Current law also authorizes the department to enter into cooperative contracts with the United States Fish and Wildlife Service for the control of nongame mammals. This bill would make it unlawful to hunt, trap, or otherwise take a bobcat, except under specified circumstances, including under a depredation permit. The bill, upon appropriation of funds by the Legislature for this purpose, commencing January 1, 2025, would authorize the commission to open a bobcat hunting season in any area determined by the commission to require a hunt, as specified.

AB 1260
(Maienschein D) Endangered wildlife.
Introduced: 2/21/2019
Last Amend: 4/11/2019
Status: 10/12/2019-Approved by the Governor. Chaptered by Secretary of State -

Chapter 767, Statutes of 2019.
Location: 10/12/2019-A. CHAPTERED
Summary: Would, commencing January 1, 2022, make it a misdemeanor to import into the state for commercial purposes, to possess with intent to sell, or to sell within the state, the dead body or other part or product of an iguana, skink, caiman, hippopotamus, or a Teju, Ring, or Nile lizard. By creating a new crime, the bill would impose a state-mandated local program.

AB 1279
(Bloom D) Planning and zoning: housing development: high-opportunity areas.
Introduced: 2/21/2019
Last Amend: 7/22/2020
Status: 8/18/2020-Failed Deadline pursuant to Rule 61(b)(13). (Last location was S. HOUSING on 4/24/2020)
Location: 8/18/2020-S. DEAD
Summary: The Planning and Zoning Law allows a development proponent to submit an application for a development that is subject to a specified streamlined, ministerial approval process not subject to a conditional use permit if the development satisfies certain objective planning standards, including that the development is (1) located in a locality determined by the Department of Housing and Community Development to have not met its share of the regional housing needs for the reporting period, and (2) subject to a requirement mandating a minimum percentage of below-market rate housing, as provided. This bill would require the department to designate areas in this state as high-opportunity areas, as provided, by January 1, 2022, in accordance with specified requirements and to update those designations within 6 months of the adoption of new Opportunity Maps by the California Tax Credit Allocation Committee.

AB 1305
(Obernolte R) Junior hunting licenses: eligibility: age requirement.
Introduced: 2/22/2019
Last Amend: 6/18/2019
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 6/19/2019)
Location: 8/31/2020-S. DEAD
Summary: Current law requires the Department of Fish and Wildlife to issue various types of hunting licenses, including a discounted hunting license known as a junior hunting license, upon payment of a certain fee from an eligible applicant. Current law provides that, until July 1, 2020, a person is eligible for a junior hunting license if the person is under 18 years of age on July 1 of the licensing year. Existing law provides that, on and after July 1, 2020, a person is eligible for a junior hunting license if the person is under 16 years of age on July 1 of the licensing year. Current law makes conforming changes to certain other types of hunting licenses as a result of the age change for a junior hunting license. This bill would extend the eligibility for a junior hunting license to a person who is under 18 years of age on July 1 of the licensing year until July 1, 2021.

AB 1387
(Wood D) Sport fishing licenses: 12-consecutive-month licenses.

Introduced: 2/22/2019
Last Amend: 5/20/2019
Status: 8/18/2020-Failed Deadline pursuant to Rule 61(b)(13). (Last location was N.R. & W. on 6/12/2019)
Location: 8/18/2020-S. DEAD
Summary: Current law requires 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 a calendar year, or, if issued after the beginning of the year, for the remainder thereof. Existing law also requires the issuance of shorter term licenses upon payment of a specified lesser fee. This bill, in addition to sport fishing licenses for the periods specified above, would require a sport fishing license to be issued to a resident or nonresident for the period of 12 consecutive months, upon payment of a fee that is equal to 130% of the fees for issuance of resident or nonresident calendar-year sport fishing licenses, as applicable.

AB 1549
(O'Donnell D) Wildlife: deer: Santa Catalina Island: report.
Introduced: 2/22/2019
Last Amend: 3/21/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/24/2020-A. DEAD
Summary: Would require the Department of Fish and Wildlife to develop, by January 1, 2022, a report, in consultation with other relevant state agencies, local governments, federal agencies, nongovernmental organizations, landowners, and scientific entities, to inform and coordinate management decisions regarding deer on Santa Catalina Island that includes, among other things, estimates of the historic, current, and future deer population on the island and an assessment of the overall health of the deer population on the island.

AB 1612
(Quirk D) Department of Fish and Wildlife: Invasive Species Response Fund.
Introduced: 2/22/2019
Last Amend: 3/28/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/17/2020-A. DEAD
Summary: Would establish the Invasive Species Response Fund in the State Treasury and would continuously appropriate money deposited in the fund to the Department of Fish and Wildlife to respond to nonnative vertebrate species invasions in coordination with other relevant government agencies. The bill would require any money received by the department from the federal government for the purpose of controlling and eradicating nonnative vertebrate species to be deposited in the fund.

AB 1659
(Bloom D) Large electrical corporations: wildfire mitigation: securitization.
Introduced: 2/22/2019
Last Amend: 8/28/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. THIRD READING on 8/30/2020)

Location: 8/31/2020-S. DEAD
Summary: Would enact the Wildfire Prevention and Community Resilience Act of 2020 and would require the Natural Resources Agency, in consultation with the Public Utilities Commission, to adopt an interim expenditure plan and an expenditure plan that are focused on reducing wildfire risk on the ground and in communities through activities such as defensible space implementation, home hardening, improved public safety, including expenditures to add trained emergency medical technicians to the workforce, and other authorized activities, as well as to prepare residents for wildfires through public education and outreach, as provided. The bill would establish the Wildfire Prevention and Community Resilience Fund and, upon appropriation by the Legislature, would require moneys in the fund be used for the implementation of those plans.

AB 1709
(Weber D) Law enforcement: use of force.
Introduced: 2/22/2019
Last Amend: 7/21/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. PUB. S. on 7/2/2020)
Location: 8/31/2020-S. DEAD
Summary: This bill would remove the specification that a peace officer making an arrest need not desist in their efforts because of resistance or threatened resistance from the person being arrested. The bill would also require a peace officer to attempt to control an incident through deescalation tactics, as defined, in an effort to reduce or avoid the need to use force, to render medical aid immediately or as soon as feasible, and to intervene to stop a violation of law or an excessive use of force by another peace officer.

AB 1788
(Bloom D) Pesticides: use of second generation anticoagulant rodenticides.
Introduced: 2/22/2019
Last Amend: 8/28/2020
Status: 9/29/2020-Approved by the Governor. Chaptered by Secretary of State - Chapter 250, Statutes of 2020.
Location: 9/29/2020-A. CHAPTERED
Summary: Current law prohibits the use of any pesticide that contains one or more of specified anticoagulants in wildlife habitat areas, as defined. Current law exempts from this prohibition the use of these pesticides for agricultural activities, as defined. Current law requires the Director of Pesticide Regulation, and each county agricultural commissioner under the direction and supervision of the director, to enforce the provisions regulating the use of pesticides. This bill, the California Ecosystems Protection Act of 2020, would additionally prohibit the use of any second generation anticoagulant rodenticide, as defined, in this state until the director certifies to the Secretary of State that, among other things, the Department of Pesticide Regulation has completed a reevaluation of second generation anticoagulant rodenticides and the Department of Pesticide Regulation, in consultation with the Department of Fish and Wildlife, has adopted any additional restrictions necessary to ensure that continued use of second generation anticoagulant rodenticides is not reasonably expected to result in significant adverse effects to nontarget wildlife, as provided.

AB 1798
(Levine D) California Racial Justice Act: death penalty.
Introduced: 2/22/2019
Last Amend: 3/21/2019
Status: 2/3/2020-From committee: Filed with the Chief Clerk pursuant to Joint Rule 56.
Location: 1/24/2020-A. DEAD
Summary: Would prohibit a person from being executed pursuant to a judgment that was either sought or obtained on the basis of race if the court makes a finding that race was a significant factor in seeking or imposing the death penalty. The bill would provide that a finding that race was a significant factor would include statistical evidence or other evidence that death sentences were sought or imposed significantly more frequently upon persons of one race than upon persons of another race or that race was a significant factor in decisions to exercise preemptory challenges during jury selection.

AB 1907
(Santiago D) California Environmental Quality Act: emergency shelters: supportive and affordable housing: exemption.
Introduced: 1/8/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was NAT. RES. on 1/30/2020)
Location: 5/29/2020-A. DEAD
Summary: Would, until January 1, 2029, exempt from environmental review under CEQA certain activities approved by or carried out by a public agency in furtherance of providing emergency shelters, supportive housing, or affordable housing, as each is defined. The bill would require a lead agency that determines to carry out or approve an activity that is within this CEQA exemption to file a notice of exemption, as specified.

AB 1934
(Voepel R) Planning and zoning: affordable housing: streamlined, ministerial approval process.
Introduced: 1/15/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was H. & C.D. on 1/23/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law, until January 1, 2026, authorizes a development proponent to submit an application for a multifamily housing development, which satisfies specified objective planning standards, that is subject to a streamlined, ministerial approval process, as provided, and not subject to a conditional use permit. Current law requires a local government to notify the development proponent in writing if the local government determines that the development conflicts with any of those objective standards by a specified time; otherwise, the development is deemed to comply with those standards. Current law provides that if a local government approves a project pursuant to that process, that approval will not expire until a specified period of time depending on the nature of the development. This bill would, notwithstanding those provisions, authorize a development proponent to submit an application for a development to be subject to a streamlined, ministerial approval process provided that development meet specified objective planning standards, including that the development provide housing for persons and families of low or moderate income

AB 1948
(Bonta D) Taxation: cannabis.
Introduced: 1/17/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. REV. & TAX on 1/30/2020)
Location: 8/31/2020-A. DEAD
Summary: AUMA requires the Legislative Analyst's Office to submit a report to the Legislature by January 1, 2020, with recommendations for adjustments to the tax rate to achieve the goals of undercutting illicit market prices and discouraging use by persons younger than 21 years of age while ensuring sufficient revenues are generated for specified programs. AUMA authorizes the Legislature to amend its provisions with a 2/3 vote of both houses to further its purposes and intent. This bill would reduce that excise tax rate to 11% on and after the operative date of this bill until July 1, 2023, at which time the excise tax rate would revert back to 15%. The bill would suspend the imposition of the cultivation tax on and after the operative date of this bill until July 1, 2023. The bill would require the bureau, the Department of Food and Agriculture, and the California Department of Tax and Fee Administration to provide the Legislature with reports measuring the success of this bill, as specified.

AB 1949
(Boerner Horvath D) Fisheries: California Ocean Resources Enhancement and Hatchery Program.
Introduced: 1/17/2020
Last Amend: 8/20/2020
Status: 9/30/2020-Signed by the Governor
Location: 9/30/2020-A. CHAPTERED
Summary: Would expand the purpose of the California Ocean Resources Enhancement and Hatchery to encompass any marine fish species important to sport and commercial fishing. The bill would revise provisions relating to the advisory panel by, among other things, specifying which members are voting members, by adding a voting member representing the public or nongovernmental organization interests, or both, by providing for an alternate member to be designated for each voting member, and by establishing 3-year terms for each member and alternate member. The bill would require all members and alternate members to be appointed by the director after soliciting nominations for members and evaluating certain criteria.

AB 2027
(Boerner Horvath D) Ocean resources management: state policy.
Introduced: 1/30/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. PRINT on 1/30/2020)
Location: 6/5/2020-A. DEAD
Summary: Current law, the California Ocean Resources Management Act of 1990, declares that it is the policy of the State of California to take specified actions related to the preservation, protection, development, and enhancement of the state's ocean resources and ensure the coordinated management of ocean resources with the appropriate federal, state, and local agencies. This bill would make nonsubstantive changes in these provisions.

AB 2028
(Aguiar-Curry D) State agencies: meetings.
Introduced: 1/30/2020
Last Amend: 8/20/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. INACTIVE FILE on 9/1/2020)
Location: 8/31/2020-S. DEAD
Summary: The Bagley-Keene Open Meeting Act, requires that a state body provide an opportunity for members of the public to directly address the body on each agenda item. Current law exempts from this requirement, among other things, an agenda item that has already been considered by a committee composed exclusively of members of the state body at a public meeting where members of the public were afforded an opportunity to address the committee on the item. This bill would delete this exception, thereby making the requirement to provide an opportunity to address the state body applicable to an agenda item for which the public had an opportunity to address it at a public meeting of a committee of the state body.

AB 2093
(Gloria D) Public records: writing transmitted by electronic mail: retention.
Introduced: 2/5/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(8). (Last location was A. APPR. on 3/10/2020)
Location: 6/5/2020-A. DEAD
Summary: Would, unless a longer retention period is required by statute or regulation, or established by the Secretary of State pursuant to the State Records Management Act, require a public agency, for purposes of the California Public Records Act, to retain and preserve for at least 2 years every public record, as defined, that is transmitted by electronic mail.

AB 2106
(Aguiar-Curry D) Wildlife habitat: Nesting Bird Habitat Incentive Program: upland game bird hunting validation: state duck hunting validation.
Introduced: 2/6/2020
Last Amend: 8/8/2020
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was S. APPR. SUSPENSE FILE on 8/17/2020)
Location: 8/21/2020-S. DEAD
Summary: Would raise by $5 the upland game bird hunting validation and the state duck hunting validation fees, as specified, with that $5 to be deposited, and available upon appropriation to the department for the Nesting Bird Habitat Incentive Program, in the Nesting Bird Habitat Incentive Program Account, which the bill would create in the Fish and Game Preservation Fund.

AB 2122
(Rubio, Blanca D) Unlawful cannabis activity: enforcement.
Introduced: 2/6/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. JUD. on 7/1/2020)

Location: 8/31/2020-S. DEAD
Summary: Would impose a civil penalty on persons aiding and abetting unlicensed commercial cannabis activity of up to $30,000 for each violation. The bill would prohibit an action for civil penalties brought against a person pursuant to MAUCRSA from commencing unless the action is filed within 3 years from the first date of discovery of the violation by a licensing authority or a participating agency, whichever is earlier or earliest. This bill contains other related provisions and other existing laws.

AB 2138
(Chau D) California Public Records Act.
Introduced: 2/10/2020
Last Amend: 5/4/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. JUD. on 2/20/2020)
Location: 6/5/2020-A. DEAD
Summary: The California Public Records Act requires state and local agencies to make their records available for public inspection, unless an exemption from disclosure applies. This bill would recodify and reorganize the provisions of the act. The bill would include provisions to govern the effect of recodification and state that the bill is intended to be entirely nonsubstantive in effect. The bill would contain related legislative findings and declarations. The bill would become operative on January 1, 2022.

AB 2214
(Carrillo D) Administrative Procedure Act: notice of proposed action.
Introduced: 2/12/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was A. & A.R. on 2/20/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law, under the Administrative Procedure Act, requires a state agency proposing to adopt, amend, or repeal specific administrative regulations to prepare, submit as specified, and make available to the public upon request, certain documents relating to the proposed regulation, including, among other things, a copy of the express terms of the proposed regulation. This bill would require the state agency to conspicuously post those documents on the state agency's website within 24 hours of submitting those documents to the office, instead of making those documents available to the public upon request. The bill would also remove an obsolete provision.

AB 2299
(Gallagher R) Free hunting days.
Introduced: 2/14/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was W.,P. & W. on 2/24/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law authorizes the Director of Fish and Wildlife to establish 2 free hunting days per year: one in the fall, and one in the winter. Existing law authorizes a California unlicensed resident to hunt during a free hunting day if accompanied by a licensed hunter, subject to certain conditions. Current law prohibits these provisions from being implemented until the Department of Fish and Wildlife's Automated License

Data System is fully operational for at least one year. This bill would require, rather than authorize, the director to establish 2 free hunting days per year, one in the fall and one in the spring, no later than July 1, 2021. The bill would delete the prohibition requiring a delay in implementation of the above-described provisions.

AB 2312
(Quirk D) Cannabis: state temporary event licenses: venues licensed by the Department of Alcoholic Beverage Control: unsold inventory.
Introduced: 2/14/2020
Last Amend: 5/4/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. B.&P. on 4/24/2020)
Location: 8/31/2020-A. DEAD
Summary: Would specifically authorize the Bureau of Cannabis Control to issue a state temporary event license to a retail licensee under MAUCRSA authorizing onsite cannabis retail sales of cannabis or cannabis products to, and consumption by, persons 21 years of age or older at an event held at a venue that is licensed by the Department of Alcoholic Beverage Control pursuant to the Alcoholic Beverage Control Act if the activities comply with specified requirements, including that the local jurisdiction authorized the event and onsite sales and consumption of cannabis or cannabis products may only occur in a separate and distinct area from alcohol sales and consumption.

AB 2316
(Obernolte R) Vehicles: off-highway vehicle recreation: City of Needles.
Introduced: 2/14/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was TRANS. on 2/24/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law, until January 1, 2025, authorizes the County of Inyo to operate a pilot project that exempts specified combined-use highways in the unincorporated area in the County of Inyo from this prohibition to link together existing roads in the unincorporated portion of the county to existing trails and trailheads on federal Bureau of Land Management or United States Forest Service lands in order to provide a unified linkage of trail systems for off-highway motor vehicles, as prescribed. Current law requires the County of Inyo to prepare and submit to the Legislature reports evaluating the effectiveness and environmental impacts of the pilot project, as specified. This bill would authorize, until January 1, 2026, a similar pilot program in the City of Needles. The bill would also require the City of Needles, in conjunction with specified state agencies, to prepare and submit to the Legislature reports evaluating the effectiveness and environmental impacts of the pilot project by January 1, 2025, as specified.

AB 2323
(Friedman D) California Environmental Quality Act: exemptions.
Introduced: 2/14/2020
Last Amend: 8/12/2020
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was S. APPR. SUSPENSE FILE on 8/20/2020)Failed Deadline pursuant to Rule 61(b)(15).

(Last location was S. APPR. SUSPENSE FILE on 8/20/2020)
Location: 8/21/2020-S. DEAD
Summary: CEQA exempts from its requirements certain residential, employment center, and mixed-use development projects meeting specified criteria, including that the project is undertaken and is consistent with a specific plan for which an environmental impact report has been certified. This bill would additionally exempt those projects located in a very low vehicle travel area, as defined. The bill would require that the project is undertaken and is consistent with either a specific plan prepared pursuant to specific provisions of law or a community plan, as defined, for which an EIR has been certified within the preceding 15 years in order to be exempt. The bill would additionally require the project site to have been previously developed or to be a vacant site meeting certain requirements.

AB 2370
(Limón D) Ventura Port District: aquaculture plots: federal waters.
Introduced: 2/18/2020
Last Amend: 3/16/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. L. GOV. on 3/12/2020)
Location: 8/31/2020-A. DEAD
Summary: Under the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000, a city or district may only provide new or extended services by contract or agreement outside of its jurisdictional boundary if it requests and receives written approval, as provided, from the local agency formation commission in the county in which the extension of service is proposed. This bill would, notwithstanding the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000, authorize the Ventura Port District, to the extent permitted by federal law, to construct, maintain, operate, lease, and grant permits to others for the installation, maintenance, and operation of aquaculture plots in federal waters off the coast of California the County of Ventura, as prescribed, in order to aid in the development or improvement of navigation or commerce to the port district.

AB 2371
(Friedman D) Climate change: Office of Planning and Research: science advisory team: climate adaptation and hazard mitigation.
Introduced: 2/18/2020
Last Amend: 7/8/2020
Status: 8/18/2020-Failed Deadline pursuant to Rule 61(b)(13). (Last location was S. E.Q. on 6/23/2020)
Location: 8/18/2020-S. DEAD
Summary: Would require the Office of Planning and Research, by July 1, 2021, to convene a climate science advisory team to provide independent, timely, and science-based advice on the state's climate adaptation and climate-related hazard mitigation efforts and to, among other things, provide input to improve climate adaptation and climate-related hazard mitigation planning across state agencies, including the plan. The bill would require the team to serve as a working group of a specified ICARP advisory group. The bill would require the team to provide recommendations to inform certain activities of the council regarding climate change.

AB 2373
(Rubio, Blanca D) Structural pest control: second generation anticoagulant rodenticides.
Introduced: 2/18/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was B.&P. on 2/24/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law provides for the licensure and regulation of structural pest control by the Structural Pest Control Board in the Department of Consumer Affairs. This bill would require a licensee, beginning July 1, 2021, to complete a training course of at least one hour on the ecological impact of second generation anti coagulant rodenticides, as defined, on wildlife with respect to primary and secondary poisoning. The bill would require the training course to be developed by the board or a provider approved by the board, and to meet and apply to the continuing education requirements for licensees established by the board.

AB 2429
(Irwin D) Hunting and fishing guides.
Introduced: 2/19/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was W.,P. & W. on 2/27/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law requires a person who engages in the business of guiding or packing, or who acts as a guide for any consideration or compensation, to first obtain a guide license from the Department of Fish and Wildlife before engaging in those activities. Current law requires an application for a guide license to contain specified information and requires an applicant to submit proof of having obtained a surety bond in the amount of not less than $1,000 as a condition of receiving a license. This bill would increase the amount of the above-described surety bond to $2,500 and would require an applicant for a guide license to submit proof of compliance with various other requirements as a condition of receiving a guide license.

AB 2437
(Quirk D) Civil actions: statute of limitations.
Introduced: 2/19/2020
Last Amend: 3/10/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. JUD. on 2/27/2020)
Location: 8/31/2020-A. DEAD
Summary: MAUCRSA imposes a 5-year statute of limitations for a licensing authority to file accusations and to seek a fine against a licensee for noncompliance with MAUCRSA's provisions, except as specified. MAUCRSA also permits a licensing authority, the Attorney General, a district attorney, a county counsel, a city prosecutor, or a city attorney to bring an action for civil penalties against a person engaging in commercial cannabis activity without a license of up to 3 times the amount of the license fee. Current law requires specified actions upon a statute for a penalty or forfeiture to commence within one year. This bill would require the agency bringing the civil action for penalties to do so within three years of discovery of the facts constituting the

grounds for commencing the action.

AB 2444
(Gallagher R) California Environmental Quality Act: exemption: wildfire defense vegetation management projects.
Introduced: 2/19/2020
Last Amend: 5/4/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was NAT. RES. on 4/24/2020)
Location: 5/29/2020-A. DEAD
Summary: Would exempt from the requirements of CEQA wildfire defense vegetation management projects, as defined, meeting certain requirements. Because a lead agency would be required to determine the applicability of this exemption to a project, this bill would impose a state-mandated local program.

AB 2518
(Wood D) Voluntary stream restoration landowner liability.
Introduced: 2/19/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. W.,P. & W. on 2/27/2020)
Location: 6/5/2020-A. DEAD
Summary: Would exempt a landowner who voluntarily allows land to be used for such a project to restore fish and wildlife habitat from civil liability for property damage or personal injury resulting from the project if the project is funded, at least in part, by a state or federal agency that promotes or encourages riparian habitat restoration, unless the property damage or personal injury is caused by willful, intentional, or reckless conduct of the landowner or by a design, construction, operation, or maintenance activity performed by the landowner.

AB 2521
(Petrie-Norris D) Small Business Procurement and Contract Act.
Introduced: 2/19/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. PRINT on 2/19/2020)
Location: 6/5/2020-A. DEAD
Summary: The Small Business Procurement and Contract Act requires the Director of General Services and the heads of other state agencies that enter into contracts for the acquisition of goods, services, and information technology and for the construction of state facilities to, among other things, establish goals for the participation of small businesses and microbusinesses in these contracts. This bill would make nonsubstantive changes to the provision naming the act.

AB 2522
(Petrie-Norris D) Sea level rise: working group: economic analyses.
Introduced: 2/19/2020
Last Amend: 5/4/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was NAT. RES. on 4/24/2020)
Location: 5/29/2020-A. DEAD

Summary: Would require state agencies to take into account the current and future impacts of sea level rise when planning, designing, building, operating, maintaining, and investing in coastal infrastructure, or otherwise approving, to the extent not in conflict with an appropriation or any other law, the dispersal of state funds for those purposes. The bill would require, by March 1, 2021, the Ocean Protection Council, in consultation with the Office of Planning and Research, to establish a multiagency working group, consisting of specified individuals, on sea level rise to provide recommended policies, resolutions, projects, and other actions to address sea level rise, the breadth of its impact, and the severity of its anticipated harm.

AB 2523
(Gray D) Fish and Game Commission: youth hunting program.
Introduced: 2/19/2020
Last Amend: 5/6/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(8). (Last location was A. APPR. SUSPENSE FILE on 6/2/2020)
Location: 6/5/2020-A. DEAD
Summary: Current law delegates to the Fish and Game Commission the power to regulate the taking or possession of birds, mammals, fish, amphibians, and reptiles, except as provided. This bill would require the commission to establish a program to increase opportunities to hunt big game, upland game birds, and migratory game birds for youth with terminal illnesses and youth who lost a parent in service to the state or country, as defined, and would require the commission to report any findings to the Legislature and the Governor on or before January 1, 2022, on the progress of the program.

AB 2574
(Dahle, Megan R) Wildlife resources: natural community conservation plans: public review and comment.
Introduced: 2/20/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(8). (Last location was A. APPR. on 5/14/2020)
Location: 6/5/2020-A. DEAD
Summary: The Natural Community Conservation Planning Act authorizes the Department of Fish and Wildlife to enter into agreements with any person or public entity for the purpose of preparing a natural community conservation plan, in cooperation with a local agency that has land use permit authority over the activities proposed to be addressed in the plan, to provide comprehensive management and conservation of multiple wildlife species. Current law requires the public to have 21 calendar days to review and comment on a proposed planning agreement before department approval of the planning agreement. This bill would expand the time for public review and comment on a proposed planning agreement from 21 calendar days to 21 business days.

AB 2607
(Mathis R) Department of Fish and Wildlife: Office of the Ombudsperson.
Introduced: 2/20/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was W.,P.

& W. on 3/5/2020)
Location: 5/29/2020-A. DEAD
Summary: The California Constitution establishes the 5-member Fish and Game Commission, with members appointed by the Governor and approved by the Senate. Current law requires the commissioners to annually elect one of their number as president. Current law requires the commission to formulate the general policies for the conduct of the department and requires the director to be guided by those policies and be responsible to the commission for the administration of the department in accordance with those policies. This bill would establish in the department the Office of the Ombudsperson administered through the ombudsperson

AB 2621
(Mullin D) Office of Planning and Research: regional climate networks: climate adaptation action plans.
Introduced: 2/20/2020
Last Amend: 8/17/2020
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was S. APPR. SUSPENSE FILE on 8/19/2020)
Location: 8/21/2020-S. DEAD
Summary: Current law requires, by July 1, 2017, and every 3 years thereafter, the Natural Resources Agency to update, as prescribed, the state's climate adaptation strategy, known as the Safeguarding California Plan. Existing law establishes the Office of Planning and Research in state government in the Governor's office. Current law establishes the Integrated Climate Adaptation and Resiliency Program to be administered by the office to coordinate regional and local efforts with state climate adaptation strategies to adapt to the impacts of climate change, as prescribed. This bill would authorize eligible agencies, as defined, to establish and participate in a regional climate network, as defined, to prepare a regional climate adaptation action plan for certain regions, as described. The bill would authorize eligible agencies to voluntarily determine whether to establish membership in a regional climate network.

AB 2623
(Arambula D) Sustainable groundwater management.
Introduced: 2/20/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. PRINT on 2/20/2020)
Location: 6/5/2020-A. DEAD
Summary: The Sustainable Groundwater Management Act requires all groundwater basins designated as high- or medium-priority basins by the Department of Water Resources that are designated as basins subject to critical conditions of overdraft to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2020, and requires all other groundwater basins designated as high- or medium-priority basins to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2022, except as specified. The act requires all relevant state agencies to consider the policies of the act, and any adopted groundwater sustainability plans, when revising or adopting policies, regulations, or criteria, or when issuing orders or determinations, where pertinent. This bill would make nonsubstantive changes in the latter provision.

AB 2665
(Mullin D) Workers' compensation: skin cancer.
Introduced: 2/20/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was INS. on 3/12/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law establishes a workers' compensation system, administered by the Administrative Director of the Division of Workers' Compensation, to compensate an employee for injuries sustained in the course of employment. Current law provides, among other things, that skin cancer developing in active lifeguards, as defined, is presumed to arise out of and in the course of employment, unless the presumption is rebutted. This bill would expand the scope of those provisions to certain peace officers of the Department of Fish and Wildlife and the Department of Parks and Recreation.

AB 2693
(Bloom D) Shasta, Trinity, and Oroville Watershed Restoration Administration.
Introduced: 2/20/2020
Last Amend: 5/4/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(8). (Last location was A. APPR. SUSPENSE FILE on 6/2/2020)
Location: 6/5/2020-A. DEAD
Summary: Would require the Natural Resources Agency and the California Environmental Protection Agency to jointly develop and submit to the Legislature a spatially explicit plan for forest and watershed restoration investments in the drainages that supply the Oroville, Shasta, and Trinity Reservoirs. The bill would establish the Shasta, Trinity, and Oroville Watershed Restoration Administration (STOWRA) under the State Water Resources Control Board to coordinate and facilitate the restoration and conservation of the watersheds supplying the Oroville, Shasta, and Trinity Reservoirs. The bill would authorize General Fund moneys to be deposited in the Headwaters Restoration Account.

AB 2697
(Muratsuchi D) Department of Fish and Wildlife: Kelp Restoration and Resilience Program: Kelp Restoration Science Advisory Committee.
Introduced: 2/20/2020
Last Amend: 5/4/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(8). (Last location was A. W.,P. & W. on 3/2/2020)
Location: 6/5/2020-A. DEAD
Summary: Would require, to the extent funds are available from bonds, appropriations by the Legislature, or other private and public sources, the Department of Fish and Wildlife to establish and administer, in consultation with the Ocean Protection Council and other relevant entities, a Kelp Restoration and Resilience Program for the purpose of achieving numerous biological and scientific goals regarding kelp, including supporting kelp recovery and preservation efforts in all coastal areas of California and conducting statewide monitoring of kelp forests to assess overall health.

AB 2787

(Chau D) Unmanned aircraft systems: delivery services.
Introduced: 2/20/2020
Last Amend: 5/4/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. P. & C.P. on 4/24/2020)
Location: 6/5/2020-A. DEAD
Summary: Would authorize an unmanned aircraft system, as defined, that is used by a business to deliver consumer products to a person in this state to be used by a business to collect, use, and retain audio, geolocation, and visual information only when reasonably necessary and proportionate to achieve the delivery purposes for which the information was collected or processed. Except as provided, the bill would require the business to destroy that information upon completion or realization of those purposes. The bill would define terms for its purposes.

AB 2812
(Garcia, Eduardo D) California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund: investment plan.
Introduced: 2/20/2020
Last Amend: 3/12/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was NAT. RES. on 3/12/2020)
Location: 5/29/2020-A. DEAD
Summary: Would, beginning July 1, 2021, 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 2839
(Garcia, Eduardo D) California Deserts Conservancy: establishment.
Introduced: 2/20/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was NAT. RES. on 3/2/2020)
Location: 5/29/2020-A. DEAD
Summary: Would establish the California Deserts Conservancy in the agency to undertake various conservation activities, as prescribed, related to the California deserts region, as defined, to protect, conserve, and restore that region's natural, cultural, archaeological, historical, and physical resources, among other functions. The bill would require the conservancy to be governed by a 13-member board of directors, as prescribed, with up to 3 additional nonvoting board members, as specified.

AB 2901
(Chau D) California Environmental Quality Act: subsequent or supplemental environmental impact report.
Introduced: 2/21/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. PRINT on 2/21/2020)

Location: 6/5/2020-A. DEAD
Summary: CEQA prohibits a lead agency or a responsible agency from requiring the preparation of a subsequent or supplemental EIR unless one or more of 3 specified events occurs. This bill would make nonsubstantive changes to the provision relating to the preparation of a subsequent or supplemental EIR.

AB 2954
(Rivas, Robert D) California Global Warming Solutions Act of 2006: climate goal: natural and working lands.
Introduced: 2/21/2020
Last Amend: 5/4/2020
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was S. APPR. SUSPENSE FILE on 8/19/2020)
Location: 8/21/2020-S. DEAD
Summary: The California Global Warming Solutions Act of 2006 requires the State Air Resources Board to prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions and to update the scoping plan at least once every 5 years. This bill would require the state board, when updating the scoping plan and in collaboration with This bill would require the state board, when updating the scoping plan and in collaboration with by January 1, 2023, an overall climate goal for the state's natural and working lands, as defined, to sequester carbon and reduce atmospheric greenhouse gas emissions and identify practices, policy incentives, and potential reductions in barriers that would help achieve the climate goal.

AB 2965
(Kalra D) Wildlife resources: state policy.
Introduced: 2/21/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. PRINT on 2/21/2020)
Location: 6/5/2020-A. DEAD
Summary: Current law declares it to be the policy of the state to encourage the preservation, conservation, and maintenance of wildlife resources under the jurisdiction and influence of the state and specifies that the policy includes certain objectives. This bill would make nonsubstantive changes to this provision.

AB 3005
(Rivas, Robert D) Leroy Anderson Dam and Reservoir: permitting, environmental review, and public contracting.
Introduced: 2/21/2020
Last Amend: 8/24/2020
Status: 9/29/2020-Vetoed by Governor.
Location: 9/29/2020-A. VETOED
Summary: Would, if the Department of Fish and Wildlife determines that the Anderson Dam project, as defined, will substantially adversely affect existing fish and wildlife resources and the Santa Clara Valley Water District completes certain actions for the project, require the department within 180 days of receipt of a notification, as defined, from the district to issue a final agreement with the district that includes reasonable

measures necessary to protect the affected resource, unless the department and the district agree to an extension.

AB 3011
(Wood D) Forestry: lumber and engineered wood products assessment: Timber Regulation and Forest Restoration Fund: loans: cannabis cultivation.
Introduced: 2/21/2020
Last Amend: 5/4/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was NAT. RES. on 4/24/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law establishes the Timber Regulation and Forest Restoration Fund in the State Treasury, and requires that all revenues received from specified assessments imposed on certain lumber and engineered wood products, less amounts deducted for specified refunds and reimbursements, be deposited into the fund, and used, upon appropriation, only for specified purposes including, until July 1, 2017, as a loan to the Department of Fish and Wildlife for activities to address environmental damage occurring on forest lands resulting from marijuana cultivation. This bill would instead authorize the loan described above until July 1, 2025, for activities to address environmental damage occurring on forest lands resulting from cannabis cultivation.

AB 3022
(Obernolte R) Junior hunting licenses: eligibility: age requirement.
Introduced: 2/21/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. APPR. SUSPENSE FILE on 6/2/2020)
Location: 8/31/2020-A. DEAD
Summary: Current law provides that, on and after July 1, 2020, a person is eligible for a junior hunting license if the person is under 16 years of age on July 1 of the licensing year. Current law makes conforming changes to certain other types of hunting licenses as a result of the age change for a junior hunting license. This bill would extend the eligibility for a junior hunting license to a person who is under 18 years of age on July 1 of the licensing year until July 1, 2021.

AB 3030
(Kalra D) Resource conservation: land and ocean conservation goals.
Introduced: 2/21/2020
Last Amend: 8/13/2020
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was S. APPR. SUSPENSE FILE on 8/19/2020)
Location: 8/21/2020-S. DEAD
Summary: Would declare it to be the goals of the state by 2030 to protect at least 30% of the state's land areas and waters; to help advance the protection of 30% of the nation's oceans; and to support regional, national, and international efforts to protect at least 30% of the world's land areas and waters and 30% of the world's ocean.

AB 3051
(Diep R) California Environmental Quality Act: judicial challenge: identification of contributors.

Introduced: 2/21/2020
Last Amend: 5/5/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. NAT. RES. on 4/24/2020)
Location: 6/5/2020-A. DEAD
Summary: The California Environmental Quality Act authorizes specified entities to file and maintain with a court an action or proceeding to attack, review, set aside, void, or annul an act of a public agency on grounds of noncompliance with the requirements of the act. This bill would require a plaintiff or petitioner, in an action brought pursuant to the act, to disclose the identity of a person or entity that contributes $1,000 or more, as specified, toward the plaintiff's or petitioner's costs of the action. The bill also would require the plaintiff or petitioner to identify any pecuniary or business interest related to the project or issues involved in the action of any person or entity that contributes $1,000 or more to the costs of the action, as specified. The bill would provide that a failure to comply with these requirements may be grounds for dismissal of the action by the court.

AB 3071
(Mullin D) Lead ammunition: shooting ranges.
Introduced: 2/21/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. W.,P. & W. on 4/24/2020)
Location: 6/5/2020-A. DEAD
Summary: Would prohibit a sport shooting range or an indoor shooting range, as defined, from selling or giving away ammunition unless that ammunition is certified as nonlead ammunition by the commission. The bill would also prohibit patrons or employees of a sport shooting range or an indoor shooting range from firing ammunition unless it is nonlead certified and would require a sport shooting range and an indoor shooting range to post a specified sign to that effect.

AB 3072
(Bigelow R) Commercial passenger fishing vessels: sport fishing licenses.
Introduced: 2/21/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. PRINT on 2/21/2020)
Location: 6/5/2020-A. DEAD
Summary: Current law prohibits the owner or operator of a licensed commercial passenger fishing vessel from permitting any person to fish from that boat or vessel unless the person has in their possession a valid sport fishing license and any required license stamp, report card, or validation. This bill would make nonsubstantive changes to this provision.

AB 3143
(Maienschein D) Endangered wildlife: stingrays.
Introduced: 2/21/2020
Last Amend: 3/12/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was W.,P. & W. on 3/12/2020)

Location: 5/29/2020-A. DEAD
Summary: Would also make it a misdemeanor to import into the state for commercial purposes, to possess with intent to sell, or to sell within the state, the dead body, or a part or product thereof, of any species of stingray, except a stingray or part thereof lawfully landed in California pursuant to a federal or state commercial fishing permit or authorization.

AB 3162
(Obernolte R) Reports submitted to legislative committees.
Introduced: 2/21/2020
Last Amend: 3/5/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was A. & A.R. on 3/5/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law requires a report required or requested by law to be submitted by a state or local agency to the Members of either house of the Legislature, generally, to be submitted in a specified manner, including a requirement that a report submitted by a state agency be posted on the state agency's internet website. This bill would additionally require a state agency to post on its internet website any report, as defined, that the state agency submits to a committee of the Legislature.

AB 3214
(Limón D) Oil and gas: oil spills: fines and penalties.
Introduced: 2/21/2020
Last Amend: 8/13/2020
Status: 9/24/2020-Approved by the Governor. Chaptered by Secretary of State - Chapter 119, Statutes of 2020.
Location: 9/24/2020-A. CHAPTERED
Summary: Current law makes it a felony to, among other things, knowingly engage in or cause the discharge or spill of oil into waters of the state, or knowingly fail to begin cleanup, abatement, or removal of spilled oil, as specified. Current law makes this crime punishable by a fine of not less than $5,000 or more than $500,000 for each day a violation occurs. Current law additionally makes it a felony to, among other things, fail to notify the Office of Emergency Services regarding an oil spill or to knowingly fail to follow the material provisions of an applicable oil spill contingency plan. Current law makes this crime punishable by a fine of not less than $2,500 or more than $250,000 for each day a violation occurs for a first conviction, and by a fine of not less than $5,000 or more than $500,000 for each day a violation occurs for a 2nd conviction. This bill would double the minimum and maximum amounts of the fines described above.

AB 3252
(Dahle, Megan R) California State Safe Harbor Agreement Program Act: notice.
Introduced: 2/21/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(8). (Last location was A. APPR. on 5/14/2020)
Location: 6/5/2020-A. DEAD
Summary: Current law requires a participating landowner to provide the Department of Fish and Wildlife, its contractors, or agents with access to the land or water proposed to

be enrolled in the California State Safe Harbor Agreement Program to develop the agreement, determine the baseline conditions, monitor the effectiveness of management actions, or safely remove or salvage species proposed to be taken. Existing law requires the department to provide notice to the landowner at least 7 days before accessing the land or water for these purposes. This bill would increase the notice period to the landowner to at least 7 business days.

AB 3256
(Garcia, Eduardo D) Economic Recovery, Wildfire Prevention, Safe Drinking Water, Drought Preparation, and Flood Protection Bond Act of 2020.
Introduced: 2/21/2020
Last Amend: 6/4/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. RLS. on 6/3/2020)
Location: 8/31/2020-A. DEAD
Summary: Would enact the Economic Recovery, Wildfire Prevention, Safe Drinking Water, Drought Preparation, and Flood Protection Bond Act of 2020, which, if approved by the voters, would authorize the issuance of bonds in the amount of $6,980,000,000 pursuant to the State General Obligation Bond Law to finance projects for an economic recovery, wildfire prevention, safe drinking water, drought preparation, and flood protection program.

AB 3263
(Gray D) Natural Heritage Preservation Tax Credit Act of 2000.
Introduced: 2/21/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. PRINT on 2/21/2020)
Location: 6/5/2020-A. DEAD
Summary: Under the Natural Heritage Preservation Tax Credit Act of 2000, property may be contributed to departments, as defined, any local government, or any nonprofit organization designated by a local government or department, based on specified criteria, in order to provide for the protection of wildlife habitat, open space, and agricultural lands. This bill would make nonsubstantive changes to the title of this act.

AB 3296
(Kiley R) California Environmental Quality Act: Department of Fish and Wildlife: review of environmental documents: revenue and cost tracking and accounting.
Introduced: 2/21/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was W.,P. & W. on 4/24/2020)
Location: 5/29/2020-A. DEAD
Summary: Current law authorizes the Department of Fish and Wildlife to impose and collect a filing fee to defray the costs of managing and protecting fish and wildlife trust resources, including, but not limited to, consulting with other public agencies, reviewing environmental documents, recommending mitigation measures, developing monitoring requirements for purposes of CEQA, and other activities protecting those trust resources identified in the review pursuant to the CEQA. This bill would require the department to separately track and account for all revenues collected under the above

filing fee provision and all costs incurred in its role as a responsible agency or trustee agency under CEQA.

AB 3325
(Brough R) California Environmental Quality Act.
Introduced: 2/21/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. PRINT on 2/21/2020)
Location: 6/5/2020-A. DEAD
Summary: The California Environmental Quality Act (CEQA), requires a lead agency, as defined, to prepare, or cause to be prepared, and certify completion of an environmental impact report on a project that it proposes to carry out or approve that may have a significant effect on the environment, or to adopt a negative declaration or mitigated negative declaration, as specified, if it finds that the project will not have that effect. CEQA includes exemptions from its environmental review requirements for numerous categories of projects, as prescribed. CEQA exempts from its environmental review requirements projects for restriping of streets or highways to relieve traffic congestion. This bill would make a nonsubstantive change to this exemption provision.

AB 3341
(Muratsuchi D) Public employment: peace officers.
Introduced: 2/21/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was A. PRINT on 2/21/2020)
Location: 6/5/2020-A. DEAD
Summary: Current law requires peace officers in this state to meet specified minimum standards, including, among other requirements, being of good moral character, as determined by a thorough background investigation. This bill would require that the background investigation for determining moral character use standards defined by the Commission on Peace Officer Standards and Training, as minimum guidelines, before the applicant may be employed or begin training as a peace officer. The bill would make related changes.

ACA 22
(Melendez R) Environmental quality: California Environmental Quality Act: housing projects: injunctions: exemptions.
Introduced: 2/20/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. PRINT on 2/20/2020)
Location: 8/31/2020-A. DEAD
Summary: Would prohibit a court, in granting relief in an action or proceeding brought under CEQA, from enjoining a housing project, as defined, unless the court finds that the continuation of the housing project presents an imminent threat to public health and safety or that the housing project site contains unforeseen important Native American artifacts or important historical, archaeological, or ecological values that would be materially, permanently, and adversely affected by the continuation of the housing project. The measure would, except as provided, prohibit the Legislature from enacting legislation to exempt projects from the requirements of CEQA unless the projects are

housing projects, projects for the development of roadway infrastructure, or projects to address an emergency circumstance for which the Governor has declared a state of emergency.

SB 1
(Atkins D) California Environmental, Public Health, and Workers Defense Act of 2019.
Introduced: 12/3/2018
Last Amend: 9/10/2019
Status: 1/13/2020-Stricken from file. Veto sustained.
Location: 9/27/2019-S. VETOED
Summary: Current state law regulates the discharge of air pollutants into the atmosphere. The Porter-Cologne Water Quality Control Act regulates the discharge of pollutants into the waters of the state. The California Safe Drinking Water Act establishes standards for drinking water and regulates drinking water systems. The California Endangered Species Act requires the Fish and Game Commission to establish a list of endangered species and a list of threatened species, and generally prohibits the taking of those species. This bill would, until January 20, 2025, require specified agencies to take prescribed actions regarding certain federal requirements and standards pertaining to air, water, and protected species, as specified. By imposing new duties on local agencies, this bill would impose a state-mandated local program.

SB 4
(McGuire D) Housing.
Introduced: 12/3/2018
Last Amend: 4/10/2019
Status: 2/3/2020-Returned to Secretary of Senate pursuant to Joint Rule 56.
Location: 1/17/2020-S. DEAD
Summary: Would authorize a development proponent of a neighborhood multifamily project or eligible transit-oriented development (TOD) project located on an eligible parcel to submit an application for a streamlined, ministerial approval process that is not subject to a conditional use permit. The bill would define a “neighborhood multifamily project” to mean a project to construct a multifamily unit of up to 2 residential dwelling units in a nonurban community, as defined, or up to 4 residential dwelling units in an urban community, as defined, that meets local height, setback, and lot coverage zoning requirements as they existed on July 1, 2019.

SB 19
(Dodd D) Water resources: stream gages.
Introduced: 12/3/2018
Last Amend: 6/11/2019
Status: 9/27/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 361, Statutes of 2019.
Location: 9/27/2019-S. CHAPTERED
Summary: Would require the Department of Water Resources and the State Water Resources Control Board, upon an appropriation of funds by the Legislature, to develop a plan to deploy a network of stream gages that includes a determination of funding needs and opportunities for modernizing and reactivating existing gages and deploying

new gages, as specified. The bill would require the department and the board, in consultation with the Department of Fish and Wildlife, the Department of Conservation, the Central Valley Flood Protection Board, interested stakeholders, and, to the extent they wish to consult, local agencies, to develop the plan to address significant gaps in information necessary for water management and the conservation of freshwater species.

SB 45
(Allen D) Wildfire Prevention, Safe Drinking Water, Drought Preparation, and Flood Protection Bond Act of 2020.
Introduced: 12/3/2018
Last Amend: 1/23/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. DESK on 1/29/2020)
Location: 8/31/2020-A. DEAD
Summary: Would enact the Wildfire Prevention, Safe Drinking Water, Drought Preparation, and Flood Protection Bond Act of 2020, which, if approved by the voters, would authorize the issuance of bonds in the amount of $5,510,000,000 pursuant to the State General Obligation Bond Law to finance projects for a wildfire prevention, safe drinking water, drought preparation, and flood protection program.

SB 62
(Dodd D) Endangered species: accidental take associated with routine and ongoing agricultural activities: state safe harbor agreements.
Introduced: 1/3/2019
Last Amend: 4/3/2019
Status: 7/30/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 137, Statutes of 2019.
Location: 7/30/2019-S. CHAPTERED
Summary: The California Endangered Species Act requires the Department of Fish and Wildlife to adopt regulations for the issuance of incidental take permits. The act also provides, until January 1, 2020, that the accidental take of candidate, threatened, or endangered species resulting from an act that occurs on a farm or a ranch in the course of otherwise lawful routine and ongoing agricultural activities is not prohibited by the act. This bill would extend this exception to January 1, 2024, and would limit this exception to an act by a person acting as a farmer or rancher, a bona fide employee of a farmer or rancher, or an individual otherwise contracted by a farmer or rancher.

SB 69
(Wiener D) Ocean Resiliency Act of 2019.
Introduced: 1/9/2019
Last Amend: 7/11/2019
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was A. 2 YEAR on 8/30/2019)
Location: 8/21/2020-A. DEAD
Summary: Current law requires the Fish and Game Commission to establish fish hatcheries for the purposes of stocking the waters of California with fish, and requires the Department of Fish and Wildlife to maintain and operate those hatcheries. This bill

would require the department to develop and implement a plan, in collaboration with specified scientists, experts, and representatives, as part of its fish hatchery operations for the improvement of the survival of hatchery-produced salmon, and the increased contribution of the hatchery program to commercial and recreational salmon fisheries.

SB 85
(Committee on Budget and Fiscal Review) Public resources: omnibus trailer bill.
Introduced: 1/10/2019
Last Amend: 6/11/2019
Status: 6/27/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 31, Statutes of 2019.
Location: 6/27/2019-S. CHAPTERED
Summary: Would require the Controller to continue to annually transfer $30,000,000 from the General Fund, less any amount transferred to the Habitat Conservation Fund from specified accounts and funds, to the Habitat Conservation Fund until June 30, 2030, and would continuously appropriate that amount on an annual basis in the same proportions to the specified entities until July 1, 2030. The bill would also make conforming and nonsubstantive changes.

SB 183
(Borgeas R) Property: wild animals.
Introduced: 1/29/2019
Status: 2/3/2020-Returned to Secretary of Senate pursuant to Joint Rule 56.
Location: 2/3/2020-S. DEAD
Summary: Current law provides that animals that are wild by nature may be the subject of ownership while those animals are living only in specified circumstances. This bill would make nonsubstantive changes to that provision of law.

SB 195
(Nielsen R) Sierra Nevada Conservancy.
Introduced: 1/31/2019
Status: 2/3/2020-Returned to Secretary of Senate pursuant to Joint Rule 56.
Location: 2/3/2020-S. DEAD
Summary: Current law establishes the Sierra Nevada Conservancy and prescribes the functions and duties of the conservancy with regard to the preservation of specified lands in the Sierra Nevada Region, as defined. Current law makes specified findings and declarations relating to the importance and significance of the Sierra Nevada Region and the need to protect, conserve, restore, and enhance lands within the region. This bill would make nonsubstantive changes in those findings and declarations.

SB 198
(Bates R) California Environmental Quality Act: historical resources.
Introduced: 1/31/2019
Status: 2/3/2020-Returned to Secretary of Senate pursuant to Joint Rule 56.
Location: 2/3/2020-S. DEAD
Summary: CEQA provides that a project may have a significant effect on the environment if the project may cause a substantial adverse change in the significance of a historical resource. This bill would make nonsubstantive changes in the provision relating to historical resources.

SB 226
(Nielsen R) Watershed restoration: wildfires: grant program.
Introduced: 2/7/2019
Last Amend: 7/3/2019
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was A. 2 YEAR on 8/30/2019)
Location: 8/21/2020-A. DEAD
Summary: Would, upon appropriation by the Legislature, require the National Resources Agency to develop and implement a watershed restoration grant program, as provided, for purposes of awarding grants to eligible counties, as defined, to assist them with watershed restoration on watersheds that have been affected by wildfire, as specified. The bill would require the agency to develop guidelines for the grant program, as provided. The bill would require an eligible county receiving funds pursuant to the grant program to submit annually to the agency a report regarding projects funded by the grant program, as provided.

SB 230
(Caballero D) Law enforcement: use of deadly force: training: policies.
Introduced: 2/7/2019
Last Amend: 9/3/2019
Status: 9/13/2019-Chaptered by Secretary of State. Chapter 285, Statutes of 2019.
Location: 9/12/2019-S. CHAPTERED
Summary: Would, by no later than January 1, 2021, require each law enforcement agency to maintain a policy that provides guidelines on the use of force, utilizing deescalation techniques and other alternatives to force when feasible, specific guidelines for the application of deadly force, and factors for evaluating and reviewing all use of force incidents, among other things. The bill would require each agency to make their use of force policy accessible to the public. By imposing additional duties on local agencies, this bill would create a state-mandated local program.

SB 243
(Borgeas R) San Joaquin River Conservancy.
Introduced: 2/11/2019
Status: 2/3/2020-Returned to Secretary of Senate pursuant to Joint Rule 56.
Location: 2/3/2020-S. DEAD
Summary: Current law establishes the San Joaquin River Conservancy and prescribes the functions and responsibilities of the conservancy with regard to the protection and conservation of public lands in the San Joaquin River Parkway, as described. Current law requires the conservancy to administer any funds appropriated to it and any revenue generated by member agencies of the conservancy for the parkway and contributed to the conservancy, and authorizes the conservancy to expend those funds for capital improvements, land acquisitions, or support of the conservancy's operations. This bill would make a nonsubstantive change in that provision requiring the conservancy to administer those funds.

SB 247
(Dodd D) Wildland fire prevention: vegetation management.
Introduced: 2/11/2019

Last Amend: 9/3/2019
Status: 10/2/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 406, Statutes of 2019.
Location: 10/2/2019-S. CHAPTERED
Summary: Would require an electrical corporation, within one month of the completion of each substantial portion of the vegetation management requirements in its wildfire mitigation plan, to notify the Wildfire Safety Division of the completion. The bill would require the division to audit the completed work and would require the audit to specify any failure of the electrical corporation to fully comply with the vegetation management requirements. The bill would require the division to provide the audit to the electrical corporation and to provide the electrical corporation a reasonable time period to correct and eliminate deficiencies specified in the audit.

SB 262
(McGuire D) Marine resources: commercial fishing and aquaculture: regulation of operations.
Introduced: 2/12/2019
Last Amend: 9/3/2019
Status: 10/2/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 472, Statutes of 2019.
Location: 10/2/2019-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 landing fees relating to the sale of fish quarterly to the Department of Fish and Wildlife, based on a rate schedule applicable to listed aquatic species. Current law authorizes the department to assess a fee on persons growing aquaculture products on public lands and in public waters based on the price per pound of the products sold, not to exceed the rates provided in the rate schedule applicable to wild-caught aquatic species. This bill would make that landing fee rate schedule applicable to the 2020 calendar year, and require that the schedule be adjusted annually thereafter pursuant to that specified federal index.
SB 281

(Wiener D) Housing development: permits and other entitlements: extension.
Introduced: 2/13/2019
Last Amend: 7/30/2020
Status: 8/14/2020-Failed Deadline pursuant to Rule 61(b)(13). (Last location was A. L. GOV. on 6/18/2020)
Location: 8/14/2020-A. DEAD
Summary: The Planning and Zoning Law requires each county and each city to adopt a comprehensive, long-term general plan for its physical development, and the development of specified land outside its boundaries, that includes, among other mandatory elements, a housing element. Current law, the Permit Streamlining Act, among other things, requires a public agency that is the lead agency for a development project to approve or disapprove that project within specified time periods. This bill would extend by 18 months the period for the expiration, effectuation, or utilization of a housing entitlement, as defined, that was issued before, and was in effect on, March 4, 2020, and that will expire before December 31, 2021, except as specified. The bill would

toll this 18-month extension during any time that the housing entitlement is the subject of a legal challenge.

SB 288

(Wiener D) California Environmental Quality Act: exemptions: transportation-related projects.
Introduced: 2/13/2019
Last Amend: 8/12/2020
Status: 9/28/2020-Approved by the Governor. Chaptered by Secretary of State. Chapter 200, Statutes of 2020.
Location: 9/28/2020-S. CHAPTERED
Summary: CEQA includes exemptions from its environmental review requirements for numerous categories of projects, including, among others, projects for the institution or increase of passenger or commuter services on rail or highway rights-of-way already in use and projects for the institution or increase of passenger or commuter service on high-occupancy vehicle lanes already in use, as specified. This bill would further exempt from the requirements of CEQA certain projects, including projects for the institution or increase of new bus rapid transit, bus, or light rail services on public rail or highway rights-of-way, as specified, whether or not the right-of-way is in use for public mass transit, as specified, and projects for the designation and conversion of general purpose lanes, high-occupancy toll lanes, high-occupancy vehicle lanes, or highway shoulders, as specified. The bill would additionally exempt transit prioritization projects, projects that improve customer information and wayfinding for transit riders, bicyclists, or pedestrians, projects by a public transit agency to construct or maintain infrastructure to charge or refuel zero-emission transit buses, projects carried out by a city or county to reduce minimum parking requirements, and projects for pedestrian and bicycle facilities.

SB 307
(Roth D) Water conveyance: use of facility with unused capacity.
Introduced: 2/15/2019
Last Amend: 4/30/2019
Status: 7/31/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 169, Statutes of 2019.
Location: 7/31/2019-S. CHAPTERED
Summary: Current law prohibits the state or a regional or local public agency from denying a bona fide transferor of water from using a water conveyance facility that has unused capacity for the period of time for which that capacity is available, if fair compensation is paid for that use and other requirements are met. This bill would, notwithstanding that provision, prohibit a transferor of water from using a water conveyance facility that has unused capacity to transfer water from a groundwater basin underlying desert lands, as defined, that is in the vicinity of specified federal lands or state lands to outside of the groundwater basin unless the State Lands Commission, in consultation with the Department of Fish and Wildlife and the Department of Water Resources, finds that the transfer of the water will not adversely affect the natural or cultural resources of those federal or state lands, as provided.

SB 313
(Hueso D) Animals: prohibition on use in circuses.

Introduced: 2/15/2019
Last Amend: 8/12/2019
Status: 10/12/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 768, Statutes of 2019.
Location: 10/12/2019-S. CHAPTERED
Summary: Would prohibit a person from sponsoring, conducting, or operating a circus, as defined, in this state that uses any animal other than a domestic dog, domestic cat, or domesticated horse. The bill would prohibit a person from exhibiting or using any animal other than a domestic dog, domestic cat, or domesticated horse in a circus in this state. The bill would authorize a civil penalty against a person who violates these prohibitions pursuant to an action brought by the Attorney General, the Department of Fish and Wildlife, the Department of Food and Agriculture, a district attorney, a city attorney, or a city prosecutor.

SB 395
(Archuleta D) Wild game mammals: accidental taking and possession of wildlife: collision with a vehicle: wildlife salvage permits.
Introduced: 2/20/2019
Last Amend: 9/6/2019
Status: 10/13/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 869, Statutes of 2019.
Location: 10/13/2019-S. CHAPTERED
Summary: Would, upon appropriation by the Legislature, authorize the Fish and Game Commission to establish, in consultation with specified public agencies and stakeholders, a pilot program no later than January 1, 2022, for the issuance of wildlife salvage permits through a user-friendly and cell-phone-friendly web-based portal developed by the Department of Fish and Wildlife to persons desiring to recover, possess, use, or transport, for purposes of salvaging wild game meat for human consumption of, any deer, elk, pronghorn antelope, or wild pig that has been accidentally killed as a result of a vehicle collision on a roadway within California.

SB 402
(Borgeas R) Vehicles: off-highway vehicle recreation: County of Inyo.
Introduced: 2/20/2019
Last Amend: 5/13/2019
Status: 8/30/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 211, Statutes of 2019.
Location: 8/30/2019-S. CHAPTERED
Summary: Current law, until January 1, 2020, authorizes the County of Inyo to establish a pilot project that would exempt specified combined-use highways in the unincorporated area in the County of Inyo from this prohibition to link together existing roads in the unincorporated portion of the county to existing trails and trailheads on federal Bureau of Land Management or United States Forest Service lands in order to provide a unified linkage of trail systems for off-highway motor vehicles, as prescribed. Current law requires the County of Inyo, in consultation with the Department of the California Highway Patrol, the Department of Transportation, and the Department of Parks and Recreation, to prepare and submit to the Legislature a report evaluating the effectiveness of the pilot project by January 1, 2019, as specified. This bill would extend

the operation of that pilot project until January 1, 2025, and would require the County of Inyo, in consultation with the above-mentioned entities, to submit an additional evaluation report to the Legislature by January 1, 2024.

SB 410
(Nielsen R) Hunting and fishing guides.
Introduced: 2/20/2019
Status: 2/3/2020-Returned to Secretary of Senate pursuant to Joint Rule 56.
Location: 1/17/2020-S. DEAD
Summary: Currentlaw requires a person who engages in the business of guiding or packing, or who acts as a guide for any consideration or compensation, to first obtain a guide license from the Department of Fish and Wildlife before engaging in those activities. Current law requires an application for a guide license to contain specified information and requires an applicant to submit proof of having obtained a surety bond in the amount of not less than $1,000 as a condition of receiving a license. Under current law, a guide license is valid from February 1 to January 31 of the succeeding year or, if issued after February 1, for the remainder of the license year. This bill would change the valid period of a guide license to the period of a calendar year, as provided, and would make related conforming changes.

SB 416
(Hueso D) Employment: workers' compensation.
Introduced: 2/20/2019
Last Amend: 9/5/2019
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. 2 YEAR on 9/15/2019)
Location: 8/31/2020-A. DEAD
Summary: Current law establishes a workers' compensation system to compensate employees for injuries sustained arising out of and in the course of their employment. Existing law designates illnesses and conditions that constitute a compensable injury for various employees, such as members of the Department of the California Highway Patrol, firefighters, and certain peace officers. These injuries include, but are not limited to, hernia, pneumonia, heart trouble, cancer, meningitis, and exposure to biochemical substances, when the illness or condition develops or manifests itself during a period when the officer or employee is in service of the employer, as specified. Would expand the coverage of the above provisions relating to compensable injuries to include all persons defined as peace officers under certain provisions of law, except as specified. This bill contains other related provisions and other existing laws.

SB 518
(Wieckowski D) Civil actions: settlement offers.
Introduced: 2/21/2019
Last Amend: 6/20/2019
Status: 1/13/2020-Stricken from file. Veto sustained.
Location: 10/12/2019-S. VETOED
Summary: Current law, in a civil action to be resolved by trial or arbitration, authorizes a party to serve an offer in writing on any other party to the action to allow judgment to be taken or an award to be entered in accordance with the terms and conditions stated

at the time. Existing law shifts specified postoffer costs to a plaintiff who does not accept a defendant's offer if the plaintiff fails to obtain a more favorable judgment or award. Current law also authorizes a court or arbitrator to order a party who does not accept the opposing party's offer and fails to obtain a more favorable judgment or award to cover the postoffer costs for the services of expert witnesses, as specified. Current law exempts certain actions from those provisions, including any labor arbitration filed pursuant to a memorandum of understanding under the Ralph C. Dills Act. This bill would also exempt from those provisions any action to enforce the California Public Records Act.

SB 542
(Stern D) Workers' compensation.
Introduced: 2/22/2019
Last Amend: 9/6/2019
Status: 10/1/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 390, Statutes of 2019.
Location: 10/1/2019-S. CHAPTERED
Summary: Under current law, a person injured in the course of employment is generally entitled to receive workers' compensation on account of that injury. Current law provides that, in the case of certain state and local firefighting personnel and peace officers, the term "injury" includes various medical conditions that are developed or manifested during a period while the member is in the service of the department or unit, and establishes a disputable presumption in this regard. This bill would provide, only until January 1, 2025, that in the case of certain state and local firefighting personnel and peace officers, the term "injury" also includes post-traumatic stress that develops or manifests itself during a period in which the injured person is in the service of the department or unit. The bill would apply to injuries occurring on or after January 1, 2020.

SB 566
(Borgeas R) Fish and Game Commission.
Introduced: 2/22/2019
Status: 2/3/2020-Returned to Secretary of Senate pursuant to Joint Rule 56.
Location: 2/3/2020-S. DEAD
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 states the intent of the Legislature to encourage the Governor and the Senate Committee on Rules to consider certain minimum qualifications in selecting, appointing, and confirming commissioners to serve on the commission. This bill would make a nonsubstantive change to this provision.

SB 587
(Monning D) California Sea Otter Voluntary Tax Contribution Fund.
Introduced: 2/22/2019
Last Amend: 6/24/2020
Status: 9/28/2020-Approved by the Governor. Chaptered by Secretary of State. Chapter 229, Statutes of 2020.
Location: 9/29/2020-S. CHAPTERED
Summary: Current law, until January 1, 2021, establishes the California Sea Otter

Fund. Current law requires any new or extended voluntary tax contribution to include the words “voluntary tax contribution” in the name of the fund, to require the administrative agency to include specified information about the fund on its internet website, and to continuously appropriate voluntary tax contributions made to the fund to the administrative agency. Current law requires the minimum contribution amount to a new or extended voluntary tax contribution fund for the second calendar year after the first appearance of the fund on the tax refund form, and each calendar year thereafter, to be $250,000. This bill would extend the operation of the above-described provisions relating to the California Sea Otter Fund to January 1, 2028, 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 equal or exceed $250,000.

SB 632
(Galgiani D) California Environmental Quality Act: State Board of Forestry and Fire Protection: vegetation treatment program: final program environmental impact report.
Introduced: 2/22/2019
Last Amend: 7/11/2019
Status: 10/2/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 411, Statutes of 2019.
Location: 10/2/2019-S. CHAPTERED
Summary: Current law establishes the State Board of Forestry and Fire Protection and vests the board with authority over wildland forest resources. This bill would require the board, as soon as practicably feasible, but by no later than February 1, 2020, to complete its environmental review under CEQA and certify a specific final program environmental impact report for a vegetation treatment program. The bill would repeal these provisions on January 1, 2021.

SB 731
(Bradford D) Peace Officers: certification: civil rights.
Introduced: 2/22/2019
Last Amend: 8/25/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was A. THIRD READING on 8/27/2020)
Location: 8/31/2020-A. DEAD
Summary: Would provide that a threat, intimidation, or coercion under the Tom Bane Civil Rights Act may be inherent in any interference with a civil right and would describe intentional acts for these purposes as an act in which the person acted with general intent or a conscious objective to engage in particular conduct.

SB 744
(Caballero D) Planning and zoning: California Environmental Quality Act: permanent supportive housing.
Introduced: 2/22/2019
Last Amend: 7/11/2019
Status: 9/26/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 346, Statutes of 2019.
Location: 9/26/2019-S. CHAPTERED
Summary: CEQA requires a lead agency to prepare a mitigated negative declaration

for a project that may have a significant effect on the environment if revisions in the project would avoid or mitigate that effect and there is no substantial evidence that the project, as revised, would have a significant effect on the environment. Current law authorizes the court, upon the motion of a party, to award attorney's fees to a prevailing party in an action that has resulted in the enforcement of an important right affecting the public interest if 3 conditions are met. This bill would specify that a decision of a public agency to seek funding from, or the department's awarding of funds pursuant to, the No Place Like Home Program is not a project for purposes of CEQA.

SB 761
(Jones R) Forestry: exemptions: emergency notices: reporting.
Introduced: 2/22/2019
Status: 2/3/2020-Returned to Secretary of Senate pursuant to Joint Rule 56.
Location: 2/3/2020-S. DEAD
Summary: Current law authorizes a registered professional forester in an emergency to file, on behalf of a timber owner or operator, a specified emergency notice with the department that allows for the immediate commencement of timber operations. Current law requires the Department of Forestry and Fire Protection and State Board of Forestry and Fire Protection, in consultation with the Department of Fish and Wildlife and the State Water Resources Control Board, commencing December 31, 2019, and annually thereafter, to review and submit a report to the Legislature on the trends in the use of, compliance with, and effectiveness of, these exemptions and emergency notice provisions, as specified. This bill would make nonsubstantive changes in that reporting requirement.

SB 776
(Skinner D) Peace officers: release of records.
Introduced: 2/22/2019
Last Amend: 8/30/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. INACTIVE FILE on 9/1/2020)
Location: 8/31/2020-S. DEAD
Summary: Current law makes peace officer and custodial officer personnel records and specified records maintained by any state or local agency, or information obtained from these records, confidential and prohibits these records from being disclosed in any criminal or civil proceeding except by discovery. Current law sets forth exceptions to this policy, including, among others, records relating to specified incidents involving the discharge of a firearm, sexual assault, perjury, or misconduct by a peace officer or custodial officer. Current law makes a record related to an incident involving the use of force against a person resulting in death or great bodily injury subject to disclosure. Current law requires a state or local agency to make these excepted records available for inspection pursuant to the California Public Records Act. This bill would, commencing July 1, 2021, make every incident involving use of force to make a member of the public comply with an officer, force that is unreasonable, or excessive force subject to disclosure.

SB 785
(Committee on Natural Resources and Water) Public resources: parklands,

freshwater resources, and coastal resources: off-highway motor vehicles: public lands.
Introduced: 3/11/2019
Last Amend: 9/3/2019
Status: 10/2/2019-Approved by the Governor. Chaptered by Secretary of State. Chapter 469, Statutes of 2019.
Location: 10/2/2019-S. CHAPTERED
Summary: Current law, until January 1, 2020, generally prohibits a person from possessing, importing, shipping, or transporting in the state, or from placing, planting, or causing to be placed or planted in any water within the state, dreissenid mussels, and authorizes the Director of Fish and Wildlife or the director's designee to engage in various enforcement activities with regard to dreissenid mussels. Among those activities, current law authorizes the director to conduct inspections of waters of the state and facilities located within waters of the state that may contain dreissenid mussels and, if those mussels are detected or may be present, order the closure of the affected waters or facilities to conveyances or otherwise restrict access to the affected waters or facilities, with the concurrence of the Secretary of the Natural Resources Agency. This bill would extend to January 1, 2030, the repeal date of those provisions.

SB 899
(Wiener D) Planning and zoning: housing development: higher education institutions and religious institutions.
Introduced: 1/30/2020
Last Amend: 8/3/2020
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was A. APPR. on 8/3/2020)
Location: 8/21/2020-A. DEAD
Summary: Would require that a housing development project be a use by right upon the request of an independent institution of higher education or religious institution that partners with a qualified developer on any land owned in fee simple by the applicant on or before January 1, 2020, if the development satisfies specified criteria. The bill would define various terms for these purposes. Among other things, the bill would require that 100% of the units, exclusive of manager units, in a housing development project eligible for approval as a use by right under these provisions be affordable to lower income households, except that 20% of the units may be for moderate-income households, provided that all the units are provided at affordable rent or affordable housing cost, as specified. The bill would authorize the development to include ancillary uses on the ground floor of the development, as specified.

SB 902
(Wiener D) Planning and zoning: housing development: density.
Introduced: 1/30/2020
Last Amend: 5/21/2020
Status: 8/21/2020-Failed Deadline pursuant to Rule 61(b)(15). (Last location was A. APPR. SUSPENSE FILE on 8/18/2020)
Location: 8/21/2020-A. DEAD
Summary: Would authorize a local government to pass an ordinance, notwithstanding any local restrictions on adopting zoning ordinances, to zone any parcel for up to 10

units of residential density per parcel, at a height specified by the local government in the ordinance, if the parcel is located in a transit-rich area, a jobs-rich area, or an urban infill site, as those terms are defined. In this regard, the bill would require the Department of Housing and Community Development, in consultation with the Office of Planning and Research, to determine jobs-rich areas and publish a map of those areas every 5 years, commencing January 1, 2022, based on specified criteria.

SB 914
(Portantino D) Firearms.
Introduced: 2/3/2020
Last Amend: 8/25/2020
Status: 9/29/2020-Vetoed by the Governor. In Senate. Consideration of Governor's veto pending.
Location: 9/29/2020-S. VETOED
Summary: Current law prohibits the purchase or receipt of a firearm by, or the sale or transfer of a firearm to, any person who does not have a firearm safety certificate, as specified. Current law also prohibits the sale or transfer of a firearm by a licensed firearm dealer to a person under 21 years of age. Current law exempts from these provisions the sale, transfer, purchase, or receipt of a firearm, other than a handgun, to or by a person without a firearm safety certificate, but in possession of a valid, unexpired hunting license, as specified. Current law also exempts the sale or transfer of a firearm, other than a handgun or semiautomatic centerfire rifle, to a person 18 years of age or older who possesses a valid, unexpired hunting license, as specified. This bill would, for purposes of these provisions, define a valid and unexpired hunting license.

SB 937
(Hill D) State agencies: web accessibility.
Introduced: 2/6/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was G.O. on 5/12/2020)
Location: 5/29/2020-S. DEAD
Summary: Would authorize a state agency to temporarily remove public documents from digital access if a justifiable impediment exists and the Director of Technology verifies the impediment prohibits full compliance and the state agency complies with certain requirements, including citing the reason for the document’s removal and listing options and instructions for how to access the document offline. The bill would make any file or document removed after October 14, 2017, subject to these requirements.

SB 974
(Hurtado D) California Environmental Quality Act: small disadvantaged community water system: state small water system: exemption.
Introduced: 2/11/2020
Last Amend: 8/25/2020
Status: 9/28/2020-Approved by the Governor. Chaptered by Secretary of State. Chapter 234, Statutes of 2020.
Location: 9/29/2020-S. CHAPTERED
Summary: Would, with certain specified exceptions, exempt from CEQA certain projects consisting solely of the installation, repair, or reconstruction of water

infrastructure, as specified, that primarily benefit a small disadvantaged community water system, as defined, or a state small water system, as defined, by improving the small disadvantaged community water system's or state small water system's water quality, water supply, or water supply reliability, by encouraging water conservation, or by providing drinking water service to existing residences within a disadvantaged community, a small disadvantaged community water system, or a state small water system where there is evidence that the water exceeds maximum contaminant levels for primary or secondary drinking water standards or where the drinking water well is no longer able to produce an adequate supply of safe drinking water.

SB 1041
(Hueso D) Hunting: deer: use of dogs.
Introduced: 2/18/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was N.R. & W. on 2/27/2020)
Location: 5/29/2020-S. DEAD
Summary: Would make it unlawful to use any dog for the purpose of hunting deer at any time. Because a violation of this provision would be a crime, the bill would impose a state-mandated local program. The bill would authorize the Department of Fish and Wildlife to capture or dispatch a dog being used to hunt deer under specified circumstances.

SB 1046
(Dahle R) Fish and wildlife: catastrophic wildfires: Sierra Nevada region: reports.
Introduced: 2/18/2020
Last Amend: 3/25/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 2/18/2020)
Location: 8/31/2020-S. DEAD
Summary: Would require the Department of Fish and Wildlife, in consultation with the Department of Forestry and Fire Protection, on or before December 31, 2021, and by December 31 each year thereafter, to study, investigate, and report to the Legislature on the impacts on wildlife and wildlife habitat resulting from any catastrophic wildfire, as defined, that occurred within the Sierra Nevada region during that calendar year, including specified information on a catastrophic wildfire's impact on ecosystems, biodiversity, and protected species. For the report required to be submitted on or before December 31, 2021, the bill would also require the report to include information about catastrophic wildfires that occurred in the Sierra Nevada region during the calendar years 2017 to 2020, inclusive.

SB 1047
(Stern D) Workers' compensation: firefighters and peace officers: post-traumatic stress.
Introduced: 2/18/2020
Last Amend: 5/5/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was L., P.E. & R. on 2/27/2020)
Location: 5/29/2020-S. DEAD

Summary: Current law provides, only until January 1, 2025, that, for certain state and local firefighting personnel and peace officers, the term “injury” includes post-traumatic stress that develops or manifests during a period in which the injured person is in the service of the department or unit, but applies only to injuries occurring on or after January 1, 2020. Current law requires the compensation awarded pursuant to this provision to include full hospital, surgical, medical treatment, disability indemnity, and death benefits. This bill would make that provision applicable to active firefighting members of the State Department of State Hospitals, the State Department of Developmental Services, and the Military Department, and to additional peace officers, including security officers of the Department of Justice when performing assigned duties as security officers and the officers of a state hospital under the jurisdiction of the State Department of State Hospitals or the State Department of Developmental Services, among other officers.

SB 1048
(Borgeas R) Advisory bodies.
Introduced: 2/18/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 2/18/2020)
Location: 8/31/2020-S. DEAD
Summary: Current law abolishes specified advisory bodies of various state agencies, boards, and commissions. This bill would make a nonsubstantive change to those provisions.

SB 1080
(Jones R) Fishing: inspection of fish.
Introduced: 2/19/2020
Status: 6/5/2020-Failed Deadline pursuant to Rule 61(b)(6). (Last location was S. N.R. & W. on 2/27/2020)
Location: 6/5/2020-S. DEAD
Summary: Current law makes it unlawful to possess on any boat or to bring ashore any fish upon which a size or weight limit is prescribed in a condition that its size or weight cannot be determined. This bill would authorize a person to bring ashore a fish taken in a lake, the Sacramento-San Joaquin Delta, or other inland waters pursuant to a sport fishing license in a condition that its size or weight cannot be determined if the fish is cleaned or otherwise cut at the end of a fishing trip on a boat that is temporarily attached to a dock or other permanent structure.

SB 1089
(Archuleta D) Law enforcement: training policies.
Introduced: 2/19/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 2/19/2020)
Location: 8/31/2020-S. DEAD
Summary: Current law establishes the Commission on Peace Officer Standards and Training in the Department of Justice and requires the commission to adopt rules establishing minimum standards regarding the recruitment of peace officers. Existing law requires the commission to develop guidelines and implement courses of instruction

regarding racial profiling, domestic violence, hate crimes, vehicle pursuits, and human trafficking, among others. Current law requires the commission to implement a course or courses of instruction for the regular and periodic training of law enforcement officers in the use of force. This bill would make a technical, nonsubstantive change to those provisions.

SB 1093
(Wiener D) Mariculture: master permitting program: designation of suitable state waters.
Introduced: 2/19/2020
Last Amend: 3/25/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was TRANS. on 2/27/2020)
Location: 5/29/2020-S. DEAD
Summary: Would require the Department of Fish and Wildlife to, by January 1, 2022, create, as prescribed, a master permitting program with 3 permit types, as specified, for shellfish, seaweed, and other low-trophic mariculture production and restoration projects. The bill would require the master permitting program to include and incorporate all necessary information and materials required by the State Lands Commission and the Fish and Game Commission to apply for, prepare, review, and finalize a water bottom lease or ground lease of state lands required by a proposed mariculture project. The bill would require the department to approve, deny, or return for revision a master permit application within 4 months and similarly require that the State Lands Commission or the Fish and Game Commission, or both, if applicable, approve or deny a water bottom lease or ground lease within 4 months, as prescribed.

SB 1128
(McGuire D) Commercial fishing: inspection: crab traps: eviscerated Dungeness crab.
Introduced: 2/19/2020
Last Amend: 3/26/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. HEALTH on 5/12/2020)
Location: 8/31/2020-S. DEAD
Summary: Would require a person who holds a commercial fishing license or a commercial fish business license, upon request of an authorized agent or employee of the Department of Fish and Wildlife, to immediately relinquish, at no charge, a fish or parts of a fish caught or landed in California to the department for the purpose of collecting a biological sample. Because a violation of this provision would be a crime, this bill would impose a state-mandated local program.

SB 1159
(Hill D) Workers' compensation: COVID-19: critical workers.
Introduced: 2/20/2020
Last Amend: 8/30/2020
Status: 9/17/2020-Approved by the Governor. Chaptered by Secretary of State. Chapter 85, Statutes of 2020.
Location: 9/17/2020-S. CHAPTERED

Summary: Would define “injury” for an employee to include illness or death resulting from the 2019 novel coronavirus disease (COVID-19) under specified circumstances, until January 1, 2023. The bill would create a disputable presumption, as specified, that the injury arose out of and in the course of the employment and is compensable, for specified dates of injury. The bill would limit the applicability of the presumption under certain circumstances. The bill would require an employee to exhaust their paid sick leave benefits and meet specified certification requirements before receiving any temporary disability benefits or, for police officers, firefighters, and other specified employees, a leave of absence. The bill would also make a claim relating to a COVID-19 illness presumptively compensable, as described above, after 30 days or 45 days, rather than 90 days.

SB 1168
(Morrell R) State agencies: licensing services.
Introduced: 2/20/2020
Last Amend: 5/13/2020
Status: 6/19/2020-Failed Deadline pursuant to Rule 61(b)(8). (Last location was S. APPR. SUSPENSE FILE on 6/9/2020)
Location: 6/19/2020-S. DEAD
Summary: Would require a state agency that issues any business license to establish a process for a person or business that is experiencing economic hardship as a result of an emergency caused by a virus to submit an application for deferral of fees required by the agency to obtain a license, renew or activate a license, or replace a physical license for display.

SB 1175
(Stern D) Animals: prohibitions on importation and possession of wild animals: live animal markets.
Introduced: 2/20/2020
Last Amend: 8/24/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. INACTIVE FILE on 9/1/2020)
Location: 8/31/2020-S. DEAD
Summary: Current law prohibits the importation, transportation, possession, or live release of listed wild animals, except under a revocable, nontransferable permit. Current law permits the Fish and Game Commission, by regulation, and in cooperation with the Department of Food and Agriculture, to add or delete wild animals from the listed wild animals that are in addition to those listed by statute. Current law requires the Department of Fish and Wildlife to publish, from time to time as changes arise, a list of animals that may not be imported or transported into this state. Under current law, any violation of the Fish and Game Code, or of any rule, regulation, or order made or adopted under this code, is a crime. This bill would delete the requirement for the department to publish the list and would instead require the department, no later than December 31, 2021, to establish a list of wild animals that may not be imported or transported into this state.

SB 1208
(Monning D) Wildlife: dudleya: taking and possession.

Introduced: 2/20/2020
Last Amend: 3/25/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 2/20/2020)
Location: 8/31/2020-S. DEAD
Summary: The California Endangered Species Act requires the Fish and Game Commission to establish a list of endangered species and a list of threatened species and to add or remove species from either list if it finds, upon the receipt of sufficient scientific information, as specified, and based solely upon the best available scientific information, that the action is warranted. The commission has listed certain species of dudleya as threatened or endangered under the act. This bill would make it unlawful to uproot, remove, harvest, or cut dudleya, as defined, from land owned by the state or a local government or from property not their own without written permission from the landowner in their immediate possession, except as provided, and would make it unlawful to sell, offer for sale, possess with intent to sell, transport for sale, export for sale, or purchase dudleya uprooted, removed, harvested, or cut in violation of that provision.

SB 1231
(Monning D) Endangered species: take: Santa Cruz long-toed salamander.
Introduced: 2/20/2020
Last Amend: 5/6/2020
Status: 9/28/2020-Approved by the Governor. Chaptered by Secretary of State. Chapter 237, Statutes of 2020.
Location: 9/29/2020-S. CHAPTERED
Summary: Would permit the Department of Fish and Wildlife to authorize under the California Endangered Species Act,, by permit, the take of the Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum) resulting from impacts attributable to the construction along the State Route 156 corridor through Moro Cojo Slough in the County of Monterey for the purpose of enhancing safety and access, if certain conditions are satisfied. The bill would also provide that those conditions are subject to amendment if required by a certain monitoring program and adaptive management process. The bill would also make a related change.

SB 1235
(Caballero D) Administrative Procedure Act: adverse economic impact.
Introduced: 2/20/2020
Last Amend: 3/25/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 2/20/2020)
Location: 8/31/2020-S. DEAD
Summary: Current law requires a state agency proposing to adopt, amend, or repeal a major regulation, on or after November 1, 2013, to prepare a standardized regulatory impact analysis in the manner prescribed by the Department of Finance that addresses, among other things, the creation or elimination of jobs within the state. This bill, among other things, would delete the requirement that a state agency prepare an economic impact assessment for proposed changes to a major regulation proposed prior to November 1, 2013, and would instead require a state agency to prepare a standardized

regulatory impact analysis for proposed changes to all major regulations. The bill would require that the economic impact assessment and the standardized regulatory impact analysis also include identification of each regulation adopted within 10 years prior to the date of the proposed regulations when the prior adopted regulations are located in the same title or division as the proposed regulations and include a brief summary of any economic impact analysis previously performed with regard to those regulations.

SB 1248
(Borgeas R) Forestry: timber harvesting plans: exemptions.
Introduced: 2/21/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 2/21/2020)
Location: 8/31/2020-S. DEAD
Summary: The Z'berg-Nejedly Forest Practice Act of 1973 prohibits a person from conducting timber operations, as defined, unless a timber harvesting plan prepared by a registered professional forester has been submitted to, and approved by, the Department of Forestry and Fire Protection. The act authorizes the State Board of Forestry and Fire Protection to exempt from some or all of those provisions of the act a person engaging in specified forest management activities, as prescribed, including the cutting or removal of trees on the person's property that eliminates the vertical continuity of vegetative fuels and the horizontal continuity of tree crowns for the purpose of reducing flammable materials and maintaining a fuel break, known as the Small Timberland Owner Exemption. This bill would make nonsubstantive changes to the above provision relating to the exemptions.

SB 1289
(Chang R) California Environmental Quality Act: exemption: housing projects.
Introduced: 2/21/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was E.Q. on 3/5/2020)
Location: 5/29/2020-S. DEAD
Summary: CEQA requires a lead agency to prepare a mitigated negative declaration for a project that may have a significant effect on the environment if revisions in the project would avoid or mitigate that effect and there is no substantial evidence that the project, as revised, would have a significant effect on the environment. This bill would, until January 1, 2029, exempt from the requirements of CEQA, housing projects that meet certain requirements. The bill would require a lead agency, if it determines that a housing project is exempt from CEQA under the above provision, to file a specified notice with the county clerk in each county in which the project is located.

SB 1296
(Durazo D) Natural resources: the Nature and Parks Career Pathway and Community Resiliency Act of 2020.
Introduced: 2/21/2020
Last Amend: 6/2/2020
Status: 6/19/2020-Failed Deadline pursuant to Rule 61(b)(8). (Last location was S. APPR. SUSPENSE FILE on 6/9/2020)
Location: 6/19/2020-S. DEAD

Summary: Current law establishes various environmental and economic policies and programs. This bill, upon appropriation by the Legislature, would establish the Nature and Parks Career Pathway and Community Resiliency Act of 2020, which would require state conservancies and the Wildlife Conservation Board to establish independent grant programs to fund climate mitigation, adaptation, or resilience, natural disaster, and other climate emergency projects, as specified.

SB 1306
(Bates R) Pesticides: bromadiolone: internet purchasing and selling.
Introduced: 2/21/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was E.Q. on 5/12/2020)
Location: 5/29/2020-S. DEAD
Summary: Current law prohibits the use of any pesticide that contains one or more of specified anticoagulants, including bromadiolone, in wildlife habitat areas, as defined. This bill would prohibit a person, business, or association from purchasing or selling bromadiolone on the internet, unless that person, business, or association is licensed or holds a permit to use or sell bromadiolone.

SB 1320
(Stern D) Climate change: California Climate Change Assessment.
Introduced: 2/21/2020
Last Amend: 8/24/2020
Status: 9/24/2020-Approved by the Governor. Chaptered by Secretary of State. Chapter 136, Statutes of 2020.
Location: 9/24/2020-S. CHAPTERED
Summary: Would require the Office of Planning and Research, through the Integrated Climate Adaptation and Resiliency Program, to develop the California Climate Change Assessment, in coordination with the Natural Resources Agency, the State Energy Resources Conservation and Development Commission, and the Strategic Growth Council, and in consultation with partner public agencies designated by the office. The bill would require the office to complete the assessment no less frequently than every 5 years. The bill would require the assessment to provide an integrated suite of products that report the impacts and risks of climate change, based on the best available science, and identify potential solutions to inform legislative policy, as provided.

SB 1362
(Stern D) Carbon neutrality: comprehensive strategy.
Introduced: 2/21/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was E.Q. on 5/12/2020)
Location: 5/29/2020-S. DEAD
Summary: Would require the State Air Resources Board, no later than July 1, 2021, to adopt a comprehensive strategy to achieve carbon neutrality in the state by no later than December 31, 2045, as specified. The bill would require the state board, before adopting the comprehensive strategy, to conduct at least 3 public workshops in consultation with the Natural Resources Agency and incorporate peer-reviewed data and models, as specified. The bill would require the state board to update the

comprehensive strategy at least once every 5 years.

SB 1372
(Monning D) Wildlife corridors and connectivity: Wildlife and Biodiversity Protection and Movement Act of 2020.
Introduced: 2/21/2020
Last Amend: 3/25/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was TRANS. on 5/12/2020)
Location: 5/29/2020-S. DEAD
Summary: Current law requires the Department of Fish and Wildlife, contingent upon funding being provided by the Wildlife Conservation Board or from other appropriate bond funds, upon appropriation by the Legislature, to investigate, study, and identify those areas in the state that are most essential as wildlife corridors and habitat linkages, as well as the impacts to those wildlife corridors from climate change, and requires the department to prioritize vegetative data development in these areas. This bill would additionally require the department to investigate, study, and identify impacts to those wildlife corridors from state infrastructure projects, including transportation and water projects, large-scale development projects not covered by an existing natural community conservation plan or habitat conservation plan, and planned or potential land conversions.

SB 1392
(Bradford D) Peace officers: basic course of training.
Introduced: 2/21/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 2/21/2020)
Location: 8/31/2020-S. DEAD
Summary: Current law requires every peace officer to have satisfactorily completed an introductory training course prescribed by the Commission on Peace Officer Standards and Training. Current law requires each applicant for admission to a basic course of training certified by the commission that includes the carrying and use of firearms, who is not sponsored by a local or other law enforcement agency, or is not a peace officer, to submit written certification to the Department of Justice that the applicant has no criminal history background that would disqualify them from possessing a firearm. This bill would make technical, nonsubstantive changes to these provisions.

SB 1405
(Galgiani D) Marine mammals: protection of cetaceans: unlawful activities.
Introduced: 2/21/2020
Status: 8/31/2020-Failed Deadline pursuant to Rule 61(b)(18). (Last location was S. RLS. on 2/21/2020)
Location: 8/31/2020-S. DEAD
Summary: Current law makes it unlawful to hold in captivity an orca, whether wild caught or captive bred, for any purpose, including for display, performance, or entertainment purposes; to breed or impregnate an orca held in captivity; to export, collect, or import the semen, other gametes, or embryos of an orca held in captivity for the purpose of artificial insemination; or to export, transport, move, or sell an orca

located in the state to another state or country. Current law creates certain exceptions to these provisions, including an exception that authorizes an orca located in the state on January 1, 2017, to continue to be held in captivity for its current purpose and, after June 1, 2017, to continue to be used for educational presentations. This bill would expand these provisions to include cetaceans, which the bill would define to mean a whale, dolphin, or porpoise in the order Cetacea.

SB 1429
(Monning D) Production or cultivation of cannabis, cannabis products, or industrial hemp: environmental violations.
Introduced: 2/21/2020
Last Amend: 3/26/2020
Status: 5/29/2020-Failed Deadline pursuant to Rule 61(b)(5). (Last location was N.R. & W. on 3/12/2020)
Location: 5/29/2020-S. DEAD
Summary: Current law makes a person found to have violated specified provisions of law generally protecting fish and wildlife, water, or other natural resources in connection with the production or cultivation of a controlled substance liable for a civil penalty in addition to any penalties imposed by any other law. Current law authorizes the imposition of larger fines on a person who violates one of these provisions on specified types of public or private land or while the person was trespassing on public or private land than on a person who violates one of these provisions on land that the person owns, leases, or otherwise uses or occupies with the consent of the landowner. Current law authorizes these civil penalties to be imposed or collected by a court or imposed administratively by the Department of Fish and Wildlife. This bill would instead make these provisions applicable to activities conducted in connection with the production or cultivation of cannabis, cannabis products, or industrial hemp.

For more information call:

Clark Blanchard, CDFW Acting Deputy Director at (916) 651-7824
Julie Oltmann, CDFW Legislative Representative at (916) 653-9772
Kristin Goree, CDFW Legislative Coordinator at (916) 653-4183

You can also find legislative information on the web at http://leginfo.legislature.ca.gov/ and follow the prompts from the ‘bill information’ link.

From: kathy Lynch <lynch@lynchlobby.com>
Sent: Thursday, August 27, 2020 9:09 AM
To: kathy Lynch <lynch@lynchlobby.com>
Subject: Article re SB 1175: Ban on Hunting Trophies Risks Funding for Healthy African Ecosystems

Attached please find the *CalMatters* article, "Ban on Hunting Trophies Risks Funding for Healthy African Ecosystems," concerning SB 1175.

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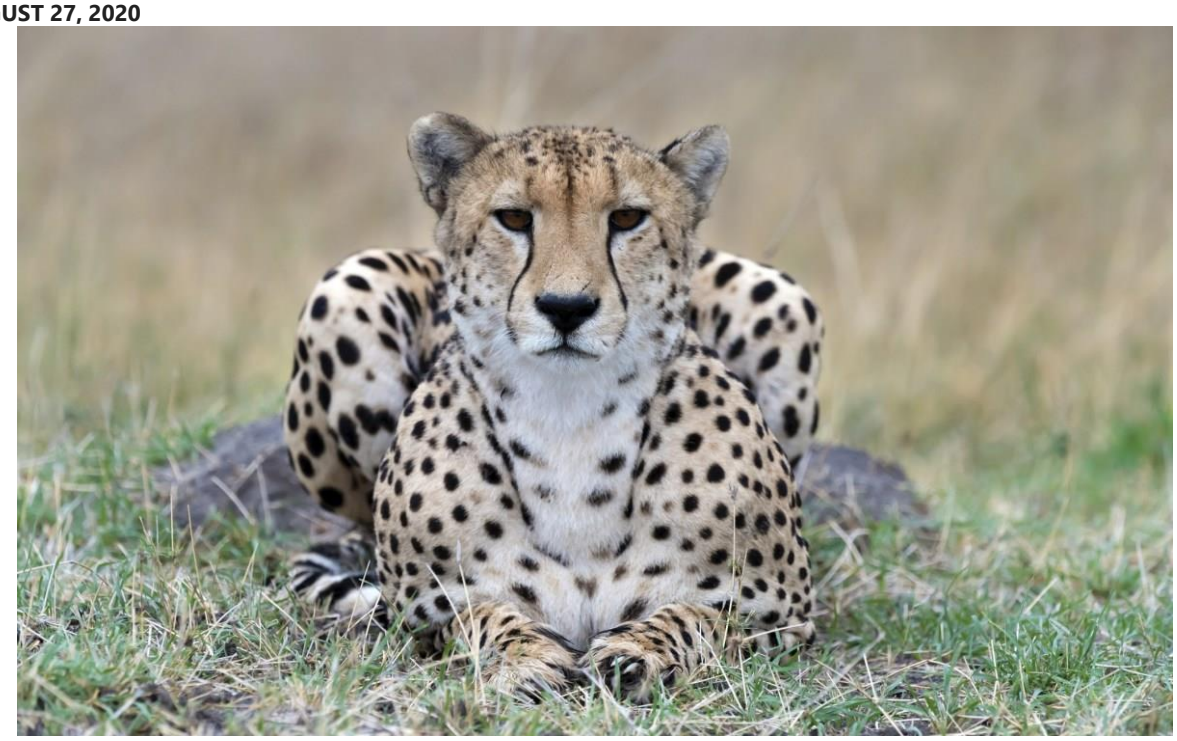
SB 1175 – OPPOSE

https://calmatters.org/commentary/my-turn/2020/08/ban-on-hunting-trophies-risks-funding-for-healthy-african-ecosystems/

Ban on hunting trophies risks funding for healthy African ecosystems

AUGUST 27, 2020



Cheetah in Hwange National Park, Zimbabwe. Photo via iStock

IN SUMMARY

The ability of African nations to conserve ecosystems would be undermined by a bill that would ban Californians from hunting and possessing hunting trophies.

By Catherine E. Semcer, Special to CalMatters

Catherine E. Semcer is a research fellow with the Property and Environment Research Center in Bozeman, Mont., and the African Wildlife Economy Institute at Stellenbosch University in Stellenbosch, South Africa, catherine@perc.org.

The COVID-19 pandemic, with its likely origin in wildlife, has brought clarity to the thin line between our civilization and the parts of our world we consider wild. To reduce the threat of

future pandemics we must conserve intact, healthy ecosystems in parts of the world, like sub-Saharan Africa, that are hotspots of emerging wildlife-borne diseases.

Doing so, however, may require confronting some uncomfortable truths. Many African countries rely on revenues from safari hunting to fund large-scale ecosystem conservation. These revenues provide strong incentives to conserve wildlife and its habitat as an alternative to clearing land for agriculture and logging, activities that push wildlife out of their native habitats, bring them into closer contact with people, and increase the risk of transmitting deadly viruses.

Unfortunately, the ability of African nations to conserve healthy ecosystems is at risk of being undermined by Senate Bill 1175, introduced by Sen. Henry Stern, a Democrat from Canoga Park, that would deter people from hunting in Africa by prohibiting Californians from possessing African hunting trophies. After all, U.S. hunters make up 70% of the consumer market for safari hunting, and California hunters form a significant portion of that percentage.

As I testified before the California Assembly earlier this year, hunting trophies of African game animals have never been linked to a disease outbreak and present no risk to public health. More importantly, the revenues raised by safari hunting are known to have funded the conservation of more than 344 million acres of healthy, intact ecosystems whose boundaries are our first line of defense against future pandemics.

The area of land conserved by safari hunting in African amounts to more than twice the size of the U.S. national park system and is 22% larger than Africa's park system. Much of this land is in private or communal ownership and must generate a financial return to provide for the basic needs of its proprietors. And while these lands are home to healthy ecosystems and wildlife populations, they lack the scenery and infrastructure that would make ecotourism an economically viable means to support their conservation.

Analysis conducted in Botswana concluded that safari hunting was the only economically viable wildlife-dependent use on two-thirds of the country's wildlife estate. Other research has found that only about a quarter of Botswana's Northern Conservation Zone has the potential for photo-tourism. And a recent study in Conservation Biology found that if safari hunting were removed from the uses available to wildlife conservancies in Namibia, 84% of them would become financially insolvent, including conservancies that also cater to photo-tourists.

Other diseases potentially far worse than COVID-19 possibly wait for us in the world's remaining wildlands. With that in mind we must focus our energy on increasing the resources available to conserve these healthy, intact ecosystems. Taking conservation tools with a proven track record of effectiveness, like safari hunting, off the table moves us in the wrong direction, especially if no alternatives are offered or available.

State of California
Department of Fish and Wildlife

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Original signed copy on file.

M e m o r a n d u m

Date: July 22, 2020

To: Melissa Miller-Henson, Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: Submission of Initial Statement of Reasons, Re: Recreational and Commercial Fishing Regulations for Federal Groundfish and Associated Species for Consistency with Federal Rules for 2021 and 2022

The Pacific Fishery Management Council recommended recreational fishing regulations for federally managed groundfish species for the 2021-2022 management cycle at its June 10-19, 2020 meeting. This action requires the Department of Fish and Wildlife (Department) to recommend to the Fish and Game Commission (Commission) amendment of several state regulations to maintain consistency with these federal regulations. In addition, the Department is proposing modification of state-defined commercial trip limits for cabezon and greenling to promote attainment of federally-established commercial harvest limits.

To ensure conforming state regulations are in place before fishing begins in 2021, at its June 24-25, 2020 meeting, the Commission authorized publication of notice of its intent to amend recreational and commercial fishing regulations for federally managed groundfish species. This allows for discussion and possible adoption at the August 19-20, 2020 and October 14-15, 2020 Commission meetings, respectively.

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 2021 and 2022 and to increase fishing opportunity while staying within harvest limits. The changes result in modifications to recreational depth restrictions, and bag limits for federally managed groundfish and state-managed species, which associate with federal groundfish. The changes also result in increases to commercial trip limits for cabezon and greenling.

If you have any questions or need additional information, please contact Dr. Craig Shuman, Marine Region Manager, at (916) 373-5491. The public notice for this rulemaking should identify Senior Environmental Scientist, Kevan Urquhart, as the Department's point of contact for this rulemaking. Mr. Urquhart can be reached at (707) 494-4621 or at Kevan.Urquhart@wildlife.ca.gov.

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State of California
Fish and Game Commission
Initial Statement of Reasons for Regulatory Action

Amend Sections 27.30, 27.35, 27.45, 28.27, 28.28, 28.54, 28.55, 28.65, 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 in 2021 and 2022

I. Date of Initial Statement of Reasons: July 1, 2020

II. Dates and Locations of Scheduled Hearings

(a) Notice Hearing

Date: June 24-25, 2020 Location: Webinar/Teleconference

(b) Discussion Hearing

Date: August 19-20, 2020 Location: Webinar/Teleconference

(c) Adoption Hearing

Date: October 14-15, 2020 Location: Webinar/Teleconference

III. Description of Regulatory Action

(a) Statement of Specific Purpose of Regulatory 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 (PCGFMP). 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 reviewed for implementation as federal fishing regulations by National Oceanic and Atmospheric Administration (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 regulations in Title 14 of the California Code of Regulations (CCR) for the recreational and nearshore commercial groundfish fisheries in state waters zero to three miles from shore. Management authority for most nearshore stocks is shared jointly between state and federal governments in conjunction with the PCGFMP 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.

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 Act (MSA) [16 USC §1856 (b)(1)].

On June 18, 2020, the PFMC recommended changes for ACLs and recreational groundfish fishing in California for the 2021 and 2022 fishing seasons, which are expected to go into effect in federal regulation on or around January 1, 2021.

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, 28.56, and 28.65 Title 14, CCR].

Present recreational regulations allow anglers to take and possess federally-managed groundfish species as defined in Section 1.91 of Title 14, CCR 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.

Current regulations specify seasons and depth constraints for the five groundfish management areas in ocean waters off California (Figure 1). These regulations serve as management tools that are adjusted biennially and inseason through PFMC action to ensure that mortality of both overfished[1] 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.

[1] "Overfished" describes any stock or stock complex whose size is sufficiently diminished that a change in management practices is required to achieve an appropriate level and rate of rebuilding. The term generally describes any stock or stock complex determined to be below its overfished/rebuilding threshold. The default proxy is generally 25 percent of its estimated unfished biomass; however, other scientifically valid values are also authorized

Figure 1. Map of five California recreational groundfish management areas.

The Northern and Mendocino Groundfish 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 and Central Groundfish Management Areas have a nine-month season, with a depth constraint of 40 fathoms and 50 fathoms (respectively). The Southern Groundfish Management Area has the least restrictive regulations, with a 10-month season and a depth constraint of 75 fathoms. The Cowcod Conservation Areas (CCA) are within the Southern Groundfish Management Area but have a discrete depth constraint of 40 fathoms.

Present regulations establish recreational bag limits which vary by species or species groups, and are designed to keep harvest within allowable limits. The Rockfish, Cabezon, and Greenling complex (RCG) has a 10 fish bag aggregate limit [Section 28.55 Title 14, CCR] meaning that each angler's catch can be composed of any combination of rockfish, cabezon, or greenling, as long as total catch remains at or below 10 fish. Sub-bag limits are implemented when harvest guidelines can't accommodate the 10 fish bag limit being composed of a single species. Present regulations include sub-bag limits for canary rockfish (two fish), black rockfish (three fish), and cabezon (three fish). Bronzespotted rockfish, cowcod, and yelloweye rockfish have bag limits of zero fish.

Current regulations specify special gear restrictions for lingcod and groundfish species in the RCG complex (i.e. when angling, gear is restricted to not more than two hooks and one line).

Commercial

Current commercial regulations establish TACs, allocations, and trip limits for federal groundfish and associated species [sections 52.10, 150.16, Title 14, CCR]. Allocations of the TAC share for commercial fisheries are often made between the trawl and non-trawl sectors, but there is only a non-trawl fishery for cabezon and greenlings statewide. Trip limits are designed to spread allowable catches through the open season to the extent possible to prevent early attainment of annual limits.

Current regulations establish cumulative two-month trip limits for cabezon, California sheephead, and greenlings statewide. No changes are being proposed for California sheephead trip limits. Current cumulative limits for cabezon are 500 pounds per two-months and greenlings are 250 pounds per two-months.

Proposed Regulations

The Department is proposing the recreational regulatory changes to be consistent with PFMC recommendations for federal groundfish regulations in 2021 and 2022. Other changes are proposed to increase commercial trip limits for cabezon and greenling.

This approach will allow the Commission to adopt state groundfish regulations to timely conform to those taking effect in federal ocean waters in January 2021.

Recreational

The recreational depth restrictions in the Mendocino and San Francisco Groundfish Management Areas are proposed to change from 20 to 30 fathoms and 40 to 50 fathoms, respectively, because of increases in allowable take of yelloweye rockfish. These changes are reflected in sections 27.30 and 27.35, respectively. 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. Thus, the proposed depth changes are necessary to provide additional angling opportunity, and are not expected to impair the rebuilding process of this stock or the time needed to rebuild.

Moving the Mendocino Groundfish Management Area from 20 to 30 fathoms in Section 27.30 would also allow use of waypoints already in federal regulations that define the 30 fathom Rockfish Conservation Area (RCA) line, instead of the general depth contour line that is currently used in state regulation to define the 20 fathom line. Department law enforcement

prefers federal RCA lines defined by connecting waypoints over the use of general contour lines, and the change would eliminate the last use of the 20 fathom contour line in California's recreational groundfish regulations.

This change is necessary for referencing the contour line in federal regulation. Amendment of these depth restrictions would align the Mendocino Groundfish Management Area RCA with the existing RCA for recreational fishing in the adjacent Northern Groundfish Management Area, and would align the San Francisco Groundfish Management Area RCA with the existing RCA in the adjacent Central Groundfish Management Area.

The recreational depth restriction in Section 27.45 for the Southern Groundfish Management Area is proposed to change from 75 to 100 fathoms. This change is necessary due to increases in allowable take of cowcod. The 2019 cowcod assessment indicates the stock has now attained a healthy and rebuilt status. The cowcod ACL south of Cape Mendocino will increase from 10 metric tons (mt) in 2020 to 84 mt in 2021 as a result of the health of the stock, and allows for the proposed Southern Groundfish Management Area depth restriction change. Note that retention of this species is not proposed, meaning that the increased harvest limits only need to cover potential increases in incidental cowcod take. Yelloweye impacts are expected to be negligible, as this area represents the extreme southern extent of the population range.

A summary of the proposed season and depth changes is provided in Table 1.

Table 1. California recreational groundfish season structure in 2021 and 2022 as recommended by the PFMC in June 2020. CCA = Cowcod Conservation Area

Management Area	**Closed Season**	**Current Open & Depth**	**Proposed Open & Depth**
Northern	Jan 1 – Apr 30	May 1 to Oct 31 < 30 fm Nov 1 to Dec 31 All Depth	No Change
Mendocino	Jan 1 – Apr 30	May 1 to Oct 31 < 20 fm Nov 1 to Dec 31 All Depth	May 1 to Oct 31 < 30 fm Nov 1 to Dec 31 All Depth
San Francisco	Jan 1 – Mar 31	Apr 1 to Dec 31 < 40 fm	Apr 1 to Dec 31 < 50 fm
Central	Jan 1 – Mar 31	Apr 1 to Dec 31 < 50 fm	No Change
Southern	Jan 1 – Feb 28	Mar 1 to Dec 31 < 75 fm	Mar 1 to Dec 31 < 100 fm
CCA	Jan 1 – Feb 28	Mar 1 to Dec 31 < 40 fm	No Change

The proposed regulations remove the recreational sub-bag limits for canary rockfish and black rockfish (subsection 28.55(b)), and cabezon (subsection 28.28(b)), which would have the effect of increasing their respective limits to 10 fish within the RCG aggregate limit of 10 fish. These changes are necessary to provide angling opportunity, and the proposed increase can be accommodated within the harvest guidelines for these species.

The proposed amendment to subsection 28.55(b) also creates a sub-bag limit of five fish for vermilion rockfish, within the RCG limit of 10 fish. The proposed change to be more restrictive is necessary due to increasing take of vermilion rockfish in recent years, without recent population information to justify such high harvest levels, therefore the precautionary reduction would help offset detrimental impacts in the absence of data.

The proposed amendment to Section 28.27 would increase the recreational bag limit for lingcod from one fish to two fish in the Mendocino, San Francisco, Central, and Southern Groundfish Management Areas (the bag limit in the Northern Groundfish Management Areas is currently two fish already). The proposed amendment to subsection 28.27(b) is necessary to simplify the limit for all five groundfish management areas, and be consistent with the current federal regulation, which has been in place since June 2019 as a result of PFMC inseason action. A two fish bag limit can be accommodated within the ACL.

The proposed amendments to Section 28.54 to add a new subsection (d), and to Section 28.65 add a method of take and restrictions for California scorpionfish. This addition is necessary to be consistent with federal regulations and with the method of take language used in state regulations for lingcod and groundfish species in the RCG complex (i.e. when angling, gear is restricted to not more than two hooks and one line).

Commercial

The proposed regulations in Section 150.16 double commercial trip limits for cabezon and greenling. Cabezon trip limits are currently 500 pounds every two months, and Greenling is 250 pounds every two months. Both stocks have been under-harvested in recent years. Offering a modest increase can be accommodated under federal harvest limits, and will uphold the Department's obligation under the NFMP.

Table 2. Proposed commercial trip limits in pounds per individual two-month period for cabezon and greenling statewide

Species	**Jan-Feb**	**Mar-Apr**	**May-Jun**	**Jul-Aug**	**Sep-Oct**	**Nov-Dec**
Cabezon	1,000 lbs/ 2 months	1,000 lbs/ 2 months	1,000 lbs/ 2 months	1,000 lbs/ 2 months	1,000 lbs/ 2 months	1,000 lbs/ 2 months
Greenling	500 lbs/ 2 months	500 lbs/ 2 months	500 lbs/ 2 months	500 lbs/ 2 months	500 lbs/ 2 months	500 lbs/ 2 months

Non-substantive Changes

The proposed regulations will update authority and reference citations.

(b) Goals and Benefits of the Regulation

It is the policy of this State to encourage the conservation, maintenance, and utilization of the living resources of the ocean and other waters under the jurisdiction and influence of the State for the benefit of all the citizens of the State and to promote the development of local fisheries and distant water fisheries based in California. 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 to the quantity that is sufficient to provide a satisfying sport. Adoption of scientifically-based groundfish seasons, depth restrictions, size limits, and bag and possession limits provides for the maintenance of sufficient populations of groundfish species to ensure their continued existence.

The goals and benefits of the proposed regulations include consistency with federal law, sustainable management of groundfish resources, and promotion of businesses that rely on recreational and commercial groundfish fishing.

(c) Authority and Reference Sections from Fish and Game Code for Regulation

Authority: Sections 200, 205, 265, 270, 275, 702, 7071 and 8587.1, Fish and Game Code

Reference: Sections 200, 205, 265, 270, 275, 702, 1802, 7071, 8585.5, 8587, 8587.1, and 8588, Fish and Game Code; Title 50, Code of Federal Regulations, Part 660, Subpart G; and Section 27.20, Title 14, CCR.

(d) Specific Technology or Equipment Required by Regulatory Change

None.

(e) Identification of Reports or Documents Supporting Regulation Change

June 2020 Pacific Fishery Management Council Decision Document https://www.pcouncil.org/documents/2020/06/june-2020-decision-document.pdf/

Pacific Coast Groundfish Fishery 2021-2022 Harvest Specifications and Management Measures. May 2020. Pacific Fishery Management Council. https://www.pcouncil.org/documents/2020/05/f-1-attachment-8-pacific-coast-groundfish-fishery-2021-2022-harvest-specifications-and-management-measures-analytical-document-organized-as-a-draft-environmental-assessment-chapters-1-5-electroni.pdf/

Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery. December 2019. Pacific Fishery Management Council. https://www.pcouncil.org/documents/2016/08/pacific-coast-groundfish-fishery-management-plan.pdf/

Nearshore Fishery Management Plan. Adopted October 25, 2002. Department of Fish and Game. https://wildlife.ca.gov/Conservation/Marine/NFMP

National Marine Fisheries Service. 2018. Fisheries Economics of the United States, 2016. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-187, 243 p. https://www.fisheries.noaa.gov/resource/document/fisheries-economics-united-states-report-2016

(f) Public Discussions of Proposed Regulations Prior to Notice Publication

Pacific Fishery Management Council meetings where the proposed regulations for the 2021 and 2022 groundfish and associated species were discussed:

- September 11-18, 2019, Boise, ID
- November 14-20, 2019, Costa Mesa, CA
- March 3-9, 2020, Rohnert Park, CA
- April 4-10, 2020, webinar only due to COVID-19
- June 10-19, 2020, webinar only due to COVID-19

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.

(b) 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 2021 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 MSA.

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. No significant changes in fishing effort and fishing expenditures are expected as a direct 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 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. No significant changes in fishing effort and fishing expenditures to businesses are expected as a direct result of the proposed regulation changes.

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

The recreational groundfish fishery is broadly sub-divided between private anglers and commercial passenger fishing vessels. The economic impact of regulatory changes for each of these categories 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. Therefore, recreational fisheries spending 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. All marine recreational anglers' trip-related and equipment expenditures sum to approximately $1.5 billion in California

(National Marine Fisheries Service, 2018)[2]. 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 $3.7 billion in total economic output annually.

This corresponds with about $800 million in total wages to Californians, which affects about 17,000 jobs in the state, annually (National Marine Fisheries Service, 2018). 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 marine recreational angler activity (e.g., rockfishes, scorpionfishes, and greenling constituted approximately 64% of all recreationally harvested species in 2016) (National Marine Fisheries Service, 2018).

The proposed regulations will modify state recreational groundfish regulations to conform to federal rules regulations that are expected to be in effect for 2021 and 2022. Currently, state regulations for groundfish provide for: season lengths, depth restrictions, size limits, and bag and possession limits. In adopting these conforming regulations, the state relies on information provided in PFMC documents which includes analysis of impacts to California.

The proposed regulatory changes remove the sub-bag limits for canary rockfish (two fish), black rockfish (three fish) and cabezon (three fish) allowing 10 fish within the RCG complex aggregate limit of 10 fish, increase the bag limit for lingcod south of 40° 10' N. latitude from one to two fish, and create a new five fish sub-bag limit for vermilion rockfish within the 10 fish RCG aggregate limit.

The economic impacts of these bag limit changes cannot be quantified due to the fact that the RCG limit remains 10 fish even though several sub-bag limits have been removed. Since the overall number of rockfish, cabezon, and greenling that can be caught per day has not changed it could be assumed that the same number of anglers will go fishing.

Alternatively, it is possible that the quality of fishing may change as a result of the removal of these sub-bag limits. Higher quality fishing may attract more anglers which would have a positive economic impact. Unfortunately, the precise potential economic impact associated with these shifts in bag and sub-bag limits cannot quantified. This is because the overall RCG bag limit will remain at 10 fish, meaning an angler's ability to take rockfish will remain the same, but there will be changes to what the composition of the 10 fish can be. The vermilion rockfish sub-bag limit is reduced, but the canary sub-bag limit is eliminated, meaning that anglers can now retain 10 canary rockfish within the RCG limit of 10 instead of just 2 canary rockfish.

The proposed changes of the depth restrictions outlined in Table 1 could result in minor economic impacts. However, the potential economic impact of depth increases cannot be quantified. It is possible that the increased area for fishing could result in increased potential fishing use that might translate to an increase in revenue associated with longer or more frequent angler trips, but precise potential impact is unknown, similar as for the bag limits described above.

[2] National Marine Fisheries Service. 2018. Fisheries Economics of the United States, 2016. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-187, 243 p. Available from: https://www.fisheries.noaa.gov/resource/document/fisheries-economics-united-states-report-2016

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, potential 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. Therefore, commercial fisheries spending multiplies throughout the economy with the indirect and induced effects of the initial direct expenditure.

About $216 million in total commercial fishing landings revenue generated about $1.2 billion in sales throughout the state marine economy (National Marine Fisheries Service, 2018). 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 $450 million in total wages to Californians, which affects about 15,000 jobs in the state, annually (National Marine Fisheries Service, 2018). 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 discards; however the extent of anticipated impacts are speculative. Economic impacts to these same businesses may result from several factors unrelated to the proposed changes to groundfish fishing regulations that are similar to those described in the recreational section above.

(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 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 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.

(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 business elimination and 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.

(d) 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.

(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 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.

(g) Other Benefits of the Regulation

This regulation would result in consistency with federal law. The PFMC 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 PCGFMP. 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 reviewed by NOAA Fisheries for legal sufficiency and compliance with the standards of MSA, and the National Environmental Policy Act, and if approved they 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 and to avoid federal preemption under the MSA.

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 (PCGFMP).

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 reviewed by the National Oceanic and Atmospheric Administration (NOAA) Fisheries for legal sufficiency and compliance with the standards of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and other federal laws, and if approved they are subsequently implemented as ocean fishing regulations by 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 PFMC-established federal annual catch limits (ACL).

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 and special gear restrictions for lingcod and groundfish species in the Rockfish/Cabezon/Greenling complex.

Current state regulations also include trip limits for the commercial cabezon and greenling fisheries.

Summary of Proposed Amendments

The Department of Fish and Wildlife (Department) is proposing the following regulatory changes to be consistent with PFMC recommendations from its June 18, 2020 meeting for federal groundfish regulations in 2021 and 2022. 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 2021.

The proposed regulatory changes will implement the following changes:

1. Increase the allowable depth for the recreational groundfish fishery in the Mendocino Groundfish Management Area from 20 to 30 fathoms;
2. Increase the allowable depth for the recreational groundfish fishery in the San Francisco Groundfish Management Area from 40 to 50 fathoms;
3. Increase the allowable depth for the recreational groundfish fishery in the Southern Groundfish Management Area from 75 to 100 fathoms;
4. Increase the recreational bag limit for lingcod from one to two fish in the Mendocino, San Francisco, Central, and Southern Groundfish Management Areas;
5. Increase the recreational bag limit for cabezon from three to 10 fish within the RCG bag limit of 10 fish;

6. Increase the recreational bag limit for canary rockfish from two to 10 fish within the RCG bag limit of 10 fish;
7. Increase the recreational bag limit for black rockfish from three to 10 fish within the RCG bag limit of 10 fish;
8. Decrease the recreational bag limit for vermilion rockfish from 10 to five fish within the RCG bag limit of 10 fish;
9. Add method of take restriction for California scorpionfish;
10. Increase commercial trip limits for cabezon from 500 to 1,000 pounds, and greenling from 250 to 500 pounds every two months;
11. Update authority and reference citations.

Benefits of the Proposed Regulations

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.

Consistency and Compatibility with Existing Regulations

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 8587.1). 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, 4 and 6 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.

Proposed Regulatory Language

Section 27.30, Title 14 CCR, is amended to read:

§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:

(1) January 1 through April 30: Closed.

(2) May 1 through October 31: Take of all species is prohibited seaward of a line approximating the ~~20~~30-fathom~~s in depth as described by general~~ depth contour ~~lines~~ along the mainland coast and along islands and offshore seamounts. The 30-fathom depth contour is defined by straight lines connecting the set of 30-fathom waypoints as adopted in Federal regulations (50 CFR Part 660, Subpart G).

(3) November 1 through December 31: Open for all species with no depth restrictions.

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; and 14 CCR 27.20.

Proposed Regulatory Language

Section 27.35, Title 14 CCR, is amended to read:

§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 March 31: Closed.

(2) April 1 through December 31: Take of all species is prohibited seaward of a line approximating the ~~40~~50-fathom depth contour along the mainland coast and along islands and offshore seamounts. The ~~40~~50-fathom depth contour is defined by straight lines connecting the set of ~~40~~50-fathom waypoints as adopted in Federal regulations (50 CFR Part 660, Subpart G).

(c) Leopard shark may be taken or possessed in Drake's Bay, Bolinas Bay, Tomales Bay, Bodega Harbor, and San Francisco Bay year-round.

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; and 14 CCR 27.20.

Proposed Regulatory Language

Section 27.45, Title 14 CCR, is amended to read:

§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~~100-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 ~~75~~100-fathom depth contour along the mainland coast and along islands and offshore seamounts. The ~~75~~100-fathom depth contour is defined by straight lines connecting the set of ~~75~~100-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.

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.

Proposed Regulatory Language

Section 28.27, Title 14 CCR, is amended to read:

§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, ~~275, 265,~~ 265, 275, 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; and 14 CCR 27.20.

Proposed Regulatory Language

Section 28.28, Title 14 CCR, is amended to read:

§28.28. Cabezon.

(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: ~~Three fish,~~10 fish within a Rockfish, Cabezon, and Greenling complex (RCG complex, as defined in Section 1.91) bag limit of 10 fish.
(c) Minimum size: 15 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 cabezon may be changed during the year or in-season by the department under the authority of subsection 27.20(e) or Section 52.10. See subsection 27.20(f) for additional information.
Note: Authority cited: Sections 200, 205, 265, 702 and 8587.1, Fish and Game Code. Reference: Sections 200, 205, 265, 1802 and 7071, Fish and Game Code; 50 CFR Part 660, Subpart G; and 14 CCR 27.20.

Proposed Regulatory Language

Section 28.54, Title 14 CCR, is amended to read:

§28.54. California Scorpionfish (Sculpin).

(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: Five.
(c) Minimum size: 10 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 California scorpionfish 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, 275, 1802 and 7071, Fish and Game Code; 50 CFR Part 660, Subpart G; and 14 CCR 27.20.

Proposed Regulatory Language

Section 28.55, Title 14 CCR, is amended to read:

§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 two fish, within the RCG bag limit.~~The limit on vermilion rockfish is five fish, within the RCG bag limit.
~~(3) The limit on black rockfish is three fish, within the RCG limit.~~
~~(4)~~(3) 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; and 14 CCR 27.20.

Proposed Regulatory Language

Section 28.65, Title 14 CCR, is amended to read:

§28.65. General.

Except as provided in this article, fin fish may be taken only on hook-and-line or by hand. Any number of hooks and lines may be used in all ocean waters and bays except:
(a) San Francisco Bay, as described in Section 27.00, where only one line with not more than three hooks may be used.
(b) On public piers, no person shall use more than two rods and lines, two hand lines, or two nets, traps or other appliances used to take crabs.
(c) When rockfish (genus *Sebastes*), California scorpionfish (*Scorpaena guttata*), lingcod (*Ophiodon elongatus*), cabezon (*Scorpaenichthys marmoratus*), or kelp or rock greenlings (*Hexagrammos decagrammus* and *Hexagrammos lagocephalus*) are aboard or in possession, where only one line with not more than two hooks may be used pursuant to Sections 28.55, 28.54, 28.27, 28.28 or 28.29, respectively.

. . . [No changes to subsections (d) through (g)]

Note: Authority cited: Sections 200, 205, 265, 270, 275 and 7071, Fish and Game Code. Reference: Sections ~~110,~~ 200, 205, 265, 270, 275 and 8585.5, Fish and Game Code.

Proposed Regulatory Language

Section 150.16, Title 14 CCR, is amended to read:

§150.16. Commercial Take of Nearshore Fishes.

. . . [No changes to subsections (a) through (d)]

(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:

	Sheephead	*Cabezon*	*Greenlings*
January-February	2,000 pounds	~~500~~1,000 pounds	~~250~~500 pounds
March-April	2,000 pounds	~~500~~1,000 pounds	~~250~~500 pounds
May-June	2,400 pounds	~~500~~1,000 pounds	~~250~~500 pounds

July-August	2,400 pounds	~~500~~1,000 pounds	~~250~~500 pounds
September-October	2,400 pounds	~~500~~1,000 pounds	~~250~~500 pounds
November-December	2,400 pounds	~~500~~1,000 pounds	~~250~~500 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 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.

. . . [No changes to subsection (f)]

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.

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SAM Section 6601-6616

STATE OF CALIFORNIA — DEPARTMENT OF FINANCE

ECONOMIC AND FISCAL IMPACT STATEMENT
(REGULATIONS AND ORDERS)

STD. 399 (Rev. 10/2019)

ECONOMIC IMPACT STATEMENT

DEPARTMENT NAME	CONTACT PERSON	EMAIL ADDRESS	TELEPHONE NUMBER
Fish and Game Commission	Margaret Duncan	margaret.duncan@wildlife.ca.gc	916 704-3215

DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400	NOTICE FILE NUMBER
Amend 27.30,et al.,T14, CCR, re: Rec.& Comm. Fishing Regs. for Federal Groundfish & Assoc. Species 2021/22	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:

- ☐ a. Impacts business and/or employees
- ☐ b. Impacts small businesses
- ☐ c. Impacts jobs or occupations
- ☐ d. Impacts California competitiveness
- ☐ e. Imposes reporting requirements
- ☐ f. Imposes prescriptive instead of performance
- ☐ g. Impacts individuals
- ☒ h. None of the above (Explain below):

No cost impacts for conformance to Federal rules (w/increased opportunities).

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 _____ (Agency/Department) estimates that the economic impact of this regulation (which includes the fiscal impact) is:

- ☐ 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: _____

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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: _____

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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 through12 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: _____

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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 _____

_____

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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
DocuSigned by: Dennis Farrell E8B0B535880C4F6...	

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
7/30/2020 DocuSigned by: Melissa A. Miller-Henson 74DED80ABE5A488...	

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

From: Alminas, Ona@Wildlife
Sent: Thursday, October 1, 2020 3:05 PM
To: FGC
Cc: Urquhart, Kevan@Wildlife; Yaremko, Marci@Wildlife; Selmon, Michelle@Wildlife
Subject: 27.20 Groundfish email in lieu of PSOR

Dear Commission staff,

This email is submitted on behalf of a Pre-Adopt Statement of Reasons (PSOR) noting that no public
comment has been received, nor are there changes to the proposed regulatory text or other documents
for the following rulemaking:
Amend Sections 27.30, 27.35, 27.45, 28.27, 28.28, 28.54, 28.55, 28.65, and 150.16, Title
14, CCR, Re: Recreational and Commercial Fishing Regulations for Federal Groundfish

and Associated Species for Consistency with Federal Rules in 2021 and 2022

Regards,
Ona Alminas

Ona Alminas, M.S.
Sr. Environmental Scientist (Specialist)
California Dept. of Fish and Wildlife
Regulations Unit
working remotely during COVID-19

State of California
Department of Fish and Wildlife

Received October 7, 2020

Memorandum

Date: October 6, 2020

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: **Agenda Item for the October 14-15, 2020 Fish and Game Commission Meeting:** ***Recommendations for Designation of new Wild Trout Waters and Modification of Current Wild Trout Waters for 2020***

Fish and Game Code, Section 7260(c), grants the Fish and Game Commission (Commission) the authority to designate Heritage Trout Waters which exemplify the uniqueness, beauty, and diversity of California's native trout and the aesthetic habitats in which they are found.

Designated Heritage Trout Waters support indigenous strains of trout within their historic drainages and provide anglers a unique opportunity to catch native trout in a manner that promotes conservation. Stocking of hatchery-origin trout is restricted within designated waters, and angling regulations are implemented that allow trout populations to sustain themselves through natural reproduction.

Fish and Game Code, Section 1727(b), requires the Department of Fish and Wildlife (Department) to annually prepare a list of no less than 25 miles of stream or stream segments and a least one lake deemed suitable for designation as Wild Trout Waters and to submit this list to the Commission. Fish and Game Code, Section 1727(c) allows the Commission to remove designated Wild Trout Waters from the wild trout program, but mandates that an equivalent number of miles are added. An additional 11 miles are proposed to replace a designation in the East Fork Carson River. To comply with these requirements, the Department proposes the following waters for designation:

Tuolumne River, from Wards Ferry Bridge upstream to the boundary of Yosemite National Park, excluding tributaries (Tuolumne County).

The proposed Wild Trout Water designation incorporates approximately 33 miles of perennial stream habitat, most of which are located on public lands administered by the U.S. Forest Service, Stanislaus National Forest. The Tuolumne River and its tributaries contain self-sustaining populations of Coastal Rainbow Trout and Brown Trout, and is a quality fishery with trophy trout (>18") potential. The Tuolumne River watershed is of state and national importance with Wild and Scenic River designations, making this fishery a unique resource in the state and a quintessential candidate for Wild Trout Designations.

The Department has conducted direct observation (snorkel) and intermittent angling surveys of this portion of the Tuolumne River drainage, both of which support designation as a high-quality stream fishery with robust populations of Coastal Rainbow Trout and Brown Trout. The Department has consulted with the Tuolumne County Board of Supervisors and Merced Fly Fishers angling club regarding this candidate designation and has received verbal support with letters to follow.

Wolf Creek, from Forest Service Road 062 crossing to Wolf Creek Lake (Mono County)

The proposed Heritage Trout designation incorporates approximately 4 miles of perennial stream habitat, most of which are located on public lands administered by the U.S. Forest Service, Inyo National Forest. The Department has conducted intermittent backpack electrofishing surveys, angling surveys, and collects Angler Survey Box data for this location, all of which support designation as a high-quality, fast-action fishery. This stream section is comprised of Lahontan Cutthroat Trout within their native range which qualifies it as a Heritage Trout Water. The Department has consulted with the U.S. National Forest Service, Mono County Board of Supervisors, Trout Unlimited, and other angling groups regarding this candidate designation and has received verbal support with letters to follow.

Butte Lake (Lassen County)

Butte Lake is located in an easily accessible, but remote and scenic setting within the north east section of Lassen Volcanic National Park. Butte Lake incorporates approximately 208 surface acres of aquatic habitat. The Department has conducted boat electrofishing surveys and has recently installed an Angler Survey Box at this location. Current boat electrofishing data support this designation as a high-quality fishery with a robust population of Coastal Rainbow Trout with trophy potential (>18”), and some Brook Trout. The Department has consulted with the U.S. National Park Service, local author and conservationist, Bob Madgic, and local angling groups regarding this candidate designation and has received verbal support with letters to follow.

Current Heritage and Wild Trout Designation Modifications:

Wild Trout Waters designated by the Commission should provide the angler with an opportunity to fish in aesthetically pleasing and environmentally productive waters with trout populations whose numbers or sizes are largely unaffected by angling. Designated waters are required to be: physically accessible by anglers; open for public angling; able to support wild trout populations of sufficient magnitude to provide satisfactory trout catches in terms of number or size of fish; and, be free of domestic strains of catchable-size trout. To comply with these requirements, the Department recommends removing the following current designation:

East Fork Carson River, from Hangman's Bridge near Markleeville downstream to the Nevada state line (Alpine County) – Requested Action: Remove

Although the 11 miles of the East Fork Carson River below Hangman's Bridge is a designated Wild Trout Water, extensive stocking in the upstream sections and associated tributaries has resulted in a mixed stock fishery consisting of large stocked rainbow trout and smaller wild trout. The Department has conducted direct observation (snorkel), angling surveys, and monitored Angler Survey Box data for this section of the East Fork Carson River, all of which document domestic strains of catchable-sized trout throughout the reach to the Nevada state line. The Department supports its current objective to manage this stream section as a mixed stock fishery and intends to continue its own stocking and support supplemental stocking by Alpine County. The Department requests that the Commission remove this Wild Trout Water designation.

COMMISSION DESIGNATED WILD TROUT WATERS

It is the policy of the Fish and Game Commission to:

I. Designate certain state waters to be managed exclusively for wild trout. Commission designated wild trout waters should provide a quality experience by providing the angler with an opportunity to fish in aesthetically pleasing and environmentally productive waters with trout populations whose numbers or sizes are largely unaffected by the angling process.

Waters designated by the Commission for wild trout management shall meet the following criteria:

A. Angler Access:

1. Open for public angling with unrestricted access when of sufficient dimensions to accommodate anglers without overcrowding.

or

2. Open for public angling with controlled access under a plan approved by the Commission setting forth the number of anglers and the method of distribution.

B. Able to support, with appropriate angling regulations, wild trout populations of sufficient magnitude to provide satisfactory trout catches in terms of number or size of fish.

II. Wild trout waters shall be managed in accordance with the following stipulations:

A. Domestic strains of catchable-sized trout shall not be planted in designated wild trout waters.

B. Hatchery-produced trout of suitable wild and semi-wild strains may be planted in designated waters, but only if necessary, to supplement natural trout reproduction.

C. Habitat protection is of utmost importance for maintenance of wild trout populations. All necessary actions, consistent with State law, shall be taken to prevent adverse impact by land or water development projects affecting designated wild trout waters.

III. The Department shall prepare and periodically update a management plan for each water designated as a wild trout water.

IV. Certain designated wild trout waters may be further designated by the Commission as "Heritage Trout Waters", to recognize the beauty, diversity, historical significance, and special values of California's native trout. Heritage Trout Waters shall meet the following additional criteria:

A. Only waters supporting populations that best exemplify indigenous strains of native trout within their historic drainages may qualify for designation.

B. Heritage Trout Waters shall be able to provide anglers with the opportunity to catch native trout consistent with the conservation of the native trout present.

V. Recognizing the importance of native trout to California's natural heritage, the Department shall emphasize education and outreach efforts to inform the public about our native trout, their habitats, and the activities for restoration of native trout when implementing the Heritage Trout Program.

A. Implement a Heritage Trout Angler Recognition Certificate through which anglers will have the opportunity to have their catches of California native trout recognized by the Commission. The criteria for receiving the formal recognition shall be maintained by the Department's Heritage and Wild Trout Program. To receive a certificate of recognition, anglers shall submit an application with supporting materials to the Department for review.

The following waters are designated by the Commission as "wild trout waters":

1. American River, North Fork, from Palisade Creek downstream to Iowa Hill Bridge (Placer County).

2. Carson River, East Fork, upstream from confluence with Wolf Creek excluding tributaries (Alpine County).

3. Clavey River, upstream from confluence with Tuolumne River excluding tributaries (Tuolumne County).

4. Fall River, from Pit No. 1 powerhouse intake upstream to origin at Thousand Springs including Spring Creek, but excluding all other tributaries (Shasta County).

5. Feather River, Middle Fork, from Oroville Reservoir upstream to Sloat vehicle bridge, excluding tributaries (Butte and Plumas counties).

6. Hat Creek, from Lake Britton upstream to Hat No. 2 powerhouse (Shasta County).

7. Hot Creek, from Hot Springs upstream to west property line of Hot Creek Ranch (Mono County).

8. Kings River, from Pine Flat Lake upstream to confluence with South and Middle forks excluding tributaries (Fresno County).

9. Kings River, South Fork, from confluence with Middle Fork upstream to western boundary of Kings Canyon National Park excluding tributaries (Fresno County).

10. Merced River, South Fork, from confluence with mainstem Merced River upstream to western boundary of Yosemite National Park excluding tributaries (Mariposa County).

11. Nelson Creek, upstream from confluence with Middle Fork Feather River excluding tributaries (Plumas County).

12. Owens River, from Five Bridges crossing upstream to Pleasant Valley Dam excluding tributaries (Inyo County).

13. Rubicon River, from confluence with Middle Fork American River upstream to Hell Hole Dam excluding tributaries (Placer County).

14. Yellow Creek, from Big Springs downstream to confluence with the North Fork of the Feather River (Plumas County).

15. Cottonwood Creek, upstream from confluence with Little Cottonwood Creek, including tributaries (Inyo County).

16. Klamath River, from Copco Lake to the Oregon border (Siskiyou County).

17. McCloud River, from Lake McCloud Dam downstream to the southern boundary of Section 36, T38N, R3W, M.D.B. & M. (Shasta County).

18. Deep Creek, from confluence with Green Valley Creek downstream to confluence with Willow Creek (San Bernardino County).

19. Middle Fork Stanislaus River, from Beardsley Afterbay Dam to Sand Bar Diversion Dam (Tuolumne County).

20. Truckee River, from confluence with Trout Creek downstream to the Nevada State line (excluding the property owned by the San Francisco Fly Casters Club) (Nevada and Sierra counties).

21. Sespe Creek, a 25-mile section between the Lion Campground and the boundary of the U.S. Forest Service, Los Padres National Forest (Ventura County).

~~22. East Fork Carson River, from Hangman's Bridge near Markleeville downstream to the Nevada state line (Alpine County).~~

~~23~~22. Bear Creek, Bear Valley Dam (impounding Big Bear Lake) downstream to the confluence with the Santa Ana River (San Bernardino County).

~~24~~23. Lavezolla Creek (Sierra County).

~~25~~24. Laurel Lake #1 and Laurel Lake #2 (Mono County).

~~26~~25. Middle Fork San Joaquin River - Northern boundary of the Devils Postpile National Monument downstream to the Lower Falls (3.6 miles); and footbridge just above the confluence with Shadow Creek downstream to the footbridge just above upper Soda Springs Campground (4 miles) (Madera County).

~~27~~26. South Fork Kern River watershed from its headwaters downstream to the southern boundary of the South Sierra Wilderness (Tulare County).

~~28~~27. Golden Trout Creek drainage, including tributaries, from confluence with the Kern River upstream to the headwaters (Tulare County).

~~29~~28. Eagle Lake, north of Susanville (Lassen County).

~~30~~29. Upper Kern River, from the Forks of the Kern, upstream to Tyndall Creek in Sequoia National Park (Tulare County).

~~31~~30. Heenan Lake, near Markleeville and Monitor ~~Pass,~~ Pass (Alpine County).

~~32~~31. Upper Truckee River, including tributaries, upstream from the confluence with Showers Creek (El Dorado and Alpine counties).

~~33~~32. Sacramento River, including tributaries, from Box Canyon Dam downstream to Scarlett Way in Dunsmuir (Siskiyou County) and from the county bridge at Sweetbriar downstream to Lake Shasta (Shasta County).

~~34~~33. Long Lake (Plumas County).

~~35~~34. Piru Creek, including tributaries, upstream of Pyramid Lake (Ventura and Los Angeles counties).

~~36~~35. Upper Stony Creek including tributaries, upstream from Mine Camp Campground (Colusa, Glenn, and Lake counties).

~~37~~36. Lower Honeymoon Lake (Fresno County).

~~38~~37. Upper East Fork San Gabriel River, including tributaries, upstream from Heaton Flat (Los Angeles County).

~~39~~38. Royce Lake # 2 (Fresno County).

~~40~~39. Lower Yuba River, from Englebright Dam to the confluence with the Feather River (Yuba and Nevada counties).

~~41~~40. Parker Lake (Mono County).

~~42~~41. South Fork San Joaquin River and all tributaries from Florence Lake upstream to the boundary of Kings Canyon National Park including the Piute Creek drainage (Fresno County).

~~43~~42. Sallie Keyes Lakes (Fresno County).

~~44~~43. Sacramento River from Keswick Dam downstream to the Red Bluff Diversion Dam (Shasta and Tehama counties).

~~45~~44. Pauley Creek from the confluence with the Downie River upstream to the headwaters (Sierra County).

~~46~~45. Caples Creek from the confluence with the Silver Fork American River upstream to Caples Lake Dam (El Dorado and Alpine counties).

~~47~~46. Putah Creek from Lake Solano upstream to Monticello Dam on Lake Berryessa (Solano and Yolo counties).

~~48~~47. Lake Solano (Solano and Yolo counties).

~~49~~48. Milton Reservoir (Nevada and Sierra counties).

~~50~~49. Gerle Creek Divide Reservoir (El Dorado County).

~~51~~50. Manzanita Lake (Shasta County).

~~52~~51. Maggie Lake (Tulare County).

~~53~~52. Little Kern River drainage, including tributaries, from the confluence with the Kern River upstream to the headwaters (Tulare County).

~~54~~53. Hilton Lake #1 (Davis Lake) (Mono County).

~~55~~54. South Fork Smith River, from the confluence with Blackhawk Creek upstream to the Island Lake Trail crossing, including the following tributaries: Buck

Creek, Quartz Creek, Eight Mile Creek, Williams Creek, Harrington Creek and Prescott Fork and excluding all other tributaries (Del Norte County).

~~56~~55. South Fork Smith River, from the confluence with Goose Creek upstream to Blackhawk Creek, including Goose Creek and Hurdygurdy Creek and excluding all other tributaries (Del Norte County).

~~57~~56. Hilton Lake # 2 (Mono County).

~~58~~57. South Fork Smith River, from the confluence with Craigs Creek upstream to the confluence with Goose Creek, including Craigs Creek, Rock Creek, and Coon Creek and excluding all other tributaries (Del Norte County).

~~59~~58. Hilton Lake # 4 (Mono County).

~~60~~59. Hilton Lake # 5 (Mono County). Hilton Lake #5 is located at the latitude/longitude of 37°28'37.99"N, 118°45'39.39W and elevation of 10,700 feet, in the Hilton Creek drainage, near Tom's Place.

60. Tuolumne River, from Wards Ferry Bridge upstream to the boundary of Yosemite National Park, excluding tributaries (Tuolumne County).

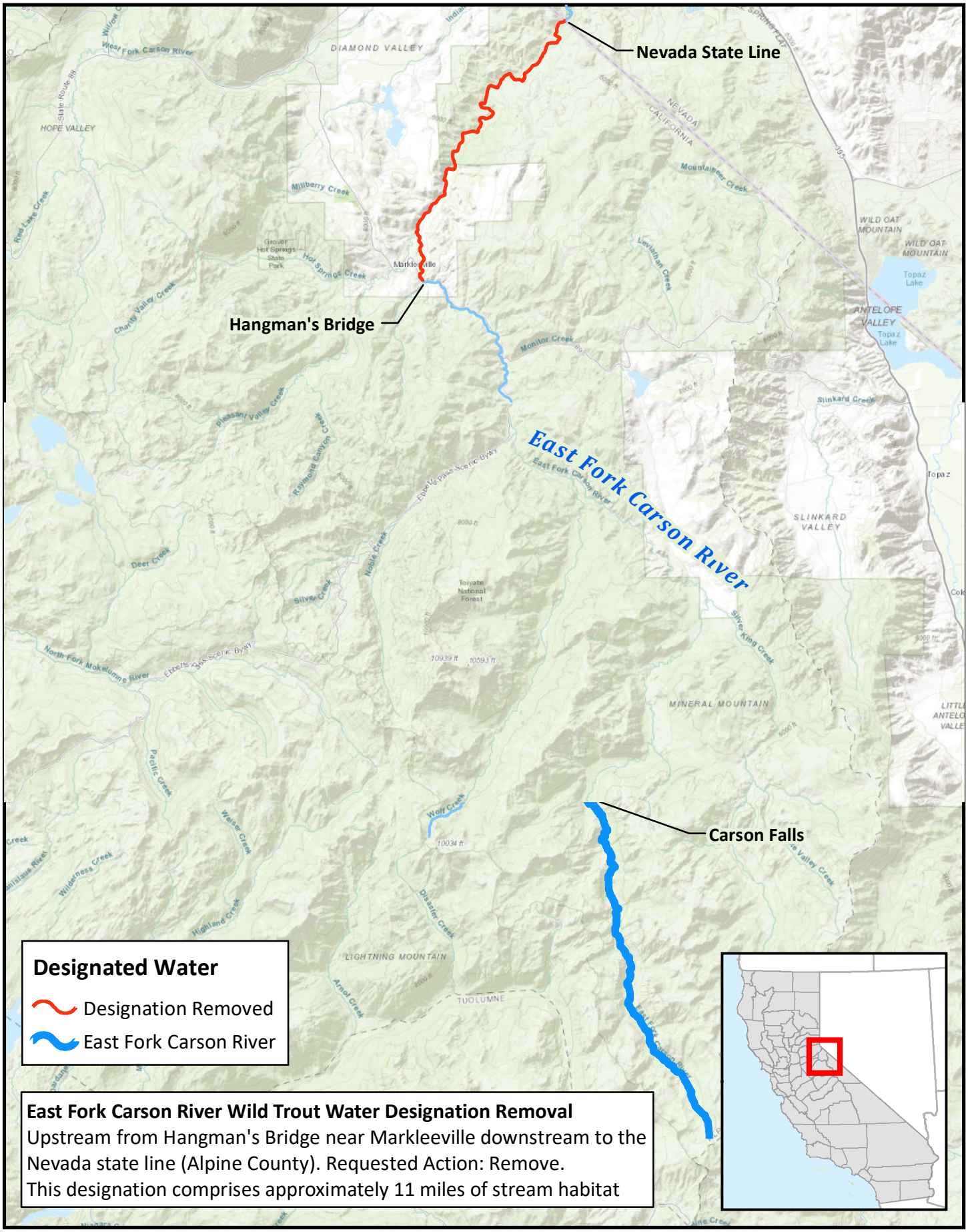
61. Butte Lake (Lassen County).

The following "wild trout waters" are further designated by the Commission as "heritage trout waters".

1. Clavey River, upstream from confluence with Tuolumne River, excluding tributaries (Tuolumne County).
2. Golden Trout Creek drainage, including tributaries, from confluence with the Kern River upstream to the headwaters (Tulare County).
3. Eagle Lake, north of Susanville, (Lassen County).
4. Upper Kern River, from the Forks of the Kern, upstream to Tyndall Creek in Sequoia National Park (Tulare County).
5. Heenan Lake, near Markleeville and Monitor Pass (Alpine County).
6. Upper Truckee River, including tributaries, upstream from the confluence with Showers Creek (El Dorado and Alpine counties).
7. Piru Creek, including tributaries, upstream of Pyramid Lake (Ventura and Los Angeles counties).
8. Upper Stony Creek including tributaries, upstream from Mine Camp Campground (Colusa, Glenn, and Lake counties).
9. Upper East Fork San Gabriel River, including tributaries, upstream from Heaton Flat (Los Angeles County).
10. Lower Yuba River, from Englebright Dam to the confluence with the Feather River (Yuba and Nevada counties).
11. Little Kern River drainage, including tributaries, from the confluence with the Kern River upstream to the headwaters (Tulare County).
12. South Fork Smith River, from the confluence with Blackhawk Creek upstream to the Island Lake Trail crossing, including the following tributaries: Buck Creek, Quartz Creek, Eight Mile Creek, Williams Creek, Harrington Creek and Prescott Fork and excluding all other tributaries (Del Norte County).
13. South Fork Smith River, from the confluence with Goose Creek upstream to Blackhawk Creek, including Goose Creek and Hurdygurdy Creek and excluding all other tributaries (Del Norte County).
14. South Fork Smith River, from the confluence with Craigs Creek upstream to the confluence with Goose Creek, including Craigs Creek, Rock Creek, and Coon Creek and excluding all other tributaries (Del Norte County).
15. Wolf Creek, from Forest Service Road 062 crossing to Wolf Creek Lake (Mono County)

(Amended: 01/04/94; 06/22/95; 03/06/97; 11/06/98; 04/02/99; 12/08/00; 04/03/03; 12/12/08; 11/04/09; 10/21/10; 11/17/11; 11/07/12; 11/06/13; 12/03/14; 12/10/15; 10/20/16; 12/06/17; 12/13/18; 02/21/20; 10/14/20)

East Fork Carson River Designated Wild Trout Water - 2020 Modification



California Department of Fish and Wildlife
Fisheries Branch GIS, August 2020
Basemap source: Esri

Tuolumne River Designated Wild Trout Water - 2020

Tuolumne River Wild Trout Water Designation

From Wards Ferry Bridge upstream to the boundary of Yosemite National Park, excluding all other tributaries (Tuolumne County).

This designation comprises approximately 33 miles of stream habitat.

0 5 10 Miles

California Department of Fish and Wildlife
Fisheries Branch GIS, September 2020
Basemap source: Esri

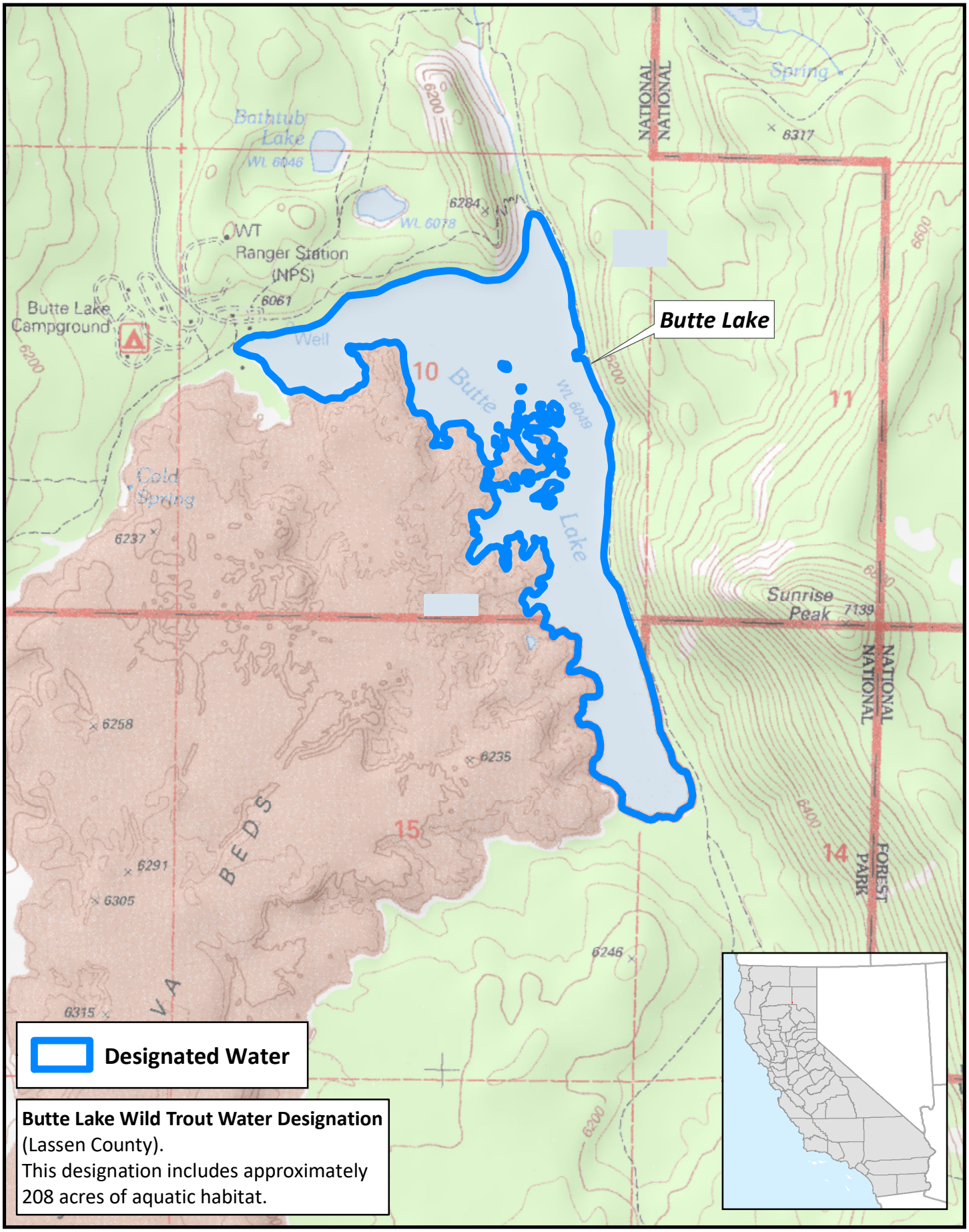
Wolf Creek Designated Heritage and Wild Trout Water - 2020

Wolf Creek Heritage and Wild Trout Water Designation
Upstream from the crossing with Forest Service Road 062 to Wolf Creek Lake (Mono County). This designation comprises approximately 4 miles of stream habitat.

0 2 Miles

California Department of Fish and Wildlife
Fisheries Branch GIS, August 2020
Basemap source: Esri

Butte Lake Designated Wild Trout Water - 2020



Butte Lake Wild Trout Water Designation (Lassen County).
This designation includes approximately 208 acres of aquatic habitat.

0 0.5 Miles

California Department of Fish and Wildlife
Fisheries Branch GIS, August 2020
Basemap source: USGS

Drift Gill Net Transition Program Update
California Fish and Game Commission
October 14, 2020

California Department of Fish and Wildlife (Department) update on the implementation of the Drift Gill Net Transition Program (DGN Transition Program, SB 1017, Allen 2018):

- 44 DGN permittees submitted declarations of intent to participate in the Transition Program by the January 1, 2020 deadline. This includes 28 out of 32 active permittees, who made landings during the prescribed window period, and 16 inactive permittees.
- The total cost for payments to permittees in the Transition Program will be $3,240,000. Additional costs include overhead for the fiscal agent and net destruction costs.
- In July, 2020, the California Ocean Protection Council (OPC) completed an agreement with the Pacific States Marine Fisheries Commission (PSMFC), the designated fiscal agent for the Transition Program, to transfer funds in support of the Program. OPC has committed $1 million as required by SB 1017 to cover a portion of the costs of payments to participating DGN permittees.
- In September, 2020, Oceana completed an agreement with PSMFC and transferred $1 million in non-State funding to cover a portion of the costs of payments to participating DGN permittees.
- Two entities have been approved by the Department for net destruction – Net Your Problem, LLC and Bureo, Inc. These Net Destruction Entities will work directly with participating permittees to receive their drift gill nets and destroy them in a recycling process.
- The OPC and Oceana funds enabled the Department to notify the first 24 approved participants that they can proceed with the Transition Program.
- As of September 25, 2020, five permittees (three active and two inactive) have completed the transition process and relinquished their nets and permits. Additional approved permittees are in contact with the Net Destruction Entities, and both entities are planning net collection events in the coming months.
- The Department is unable to notify additional permittees of their approval to participate until additional funds are available. An additional $1.3 million is required to complete the buyout of all eligible permittees.

Ballanti Buck, Rachel@FGC

From: Shester, Geoff <GShester@oceana.org>
Sent: Monday, September 14, 2020 4:08 PM
To: FGC; Miller-Henson, Melissa@FGC; Ashcraft, Susan@FGC
Subject: Oceana Delivers $1 Million to End California's Drift Gillnet Fishery
Attachments: Oceana Delivers $1 Million to End California's Deadly Drift Gillnet Fishery .pdf

Warning: This email originated from outside of CDFW and should be treated with extra caution.

Hello Melissa, Susan, and Commission staff,

We wanted to pass along the news that Oceana has delivered $1 million to the California drift gillnet transition fund established under Senate Bill 1017. This activates the provision under the statute that phases out the remaining fishery on January 31 of the fourth calendar year following deposit of the $1 million by non-state entities (Jan. 31, 2024). Thank you for your help and support with this initiative along the way, and please thank the Commission for supporting this legislation.

Attached is our press release announcing the delivery of funds. Please let us know if you have any questions,

Thanks,
Geoff

Geoff Shester, Ph.D. | California Campaign Director and Senior Scientist
OCEANA Protecting the World's Oceans
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OCEANA Protecting the World's Oceans

PRESS RELEASE

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For Immediate Release: September 14, 2020

Contacts: Geoff Shester, 831.207.6981, gshester@oceana.org
Jamie Karnik, 907.635.8722, jkarnik@oceana.org

Oceana Delivers $1 Million to End California's Deadly Drift Gillnet Fishery

Removing Drift Gillnets Will Save Endangered Whales and Sea Turtles

MONTEREY, Calif. — Today, Oceana delivered $1 million to California to help end the state's deadly drift gillnet fishery. The funds, which were made possible by generous donations from the Marisla Foundation, Cinco

Hermanos Fund, Offield Family Foundation, and Sue J. Gross Foundation, as well as several families and individuals, match the state's contribution to fund a transition for fishermen who hand in their nets and relinquish their drift gillnet permits. These drift gillnets — which are a mile long, nearly invisible and set out overnight near the ocean's surface to capture swordfish — are responsible for entangling, injuring and killing whales, dolphins, sea lions, sea turtles, sharks and other important non-targeted fish species.

"We are absolutely thrilled at this news, especially after so many long-fought years of campaigning. It is a true blessing to know that our children and grandchildren will grow up with a California ocean free of deadly drift gillnets. We are so thankful to the donors who generously contributed funds toward this innovative transition program that will save whales, sea turtles and other ocean wildlife by removing harmful drift gillnets from our oceans, and provide opportunities for California fishermen to catch swordfish with more selective methods like deep-set buoy gear," said Geoff Shester, Oceana's California campaign director. "We commend local fishermen for being part of the solution and are glad to see them receive financial assistance during these challenging times."

After years of campaigning by Oceana and others, California passed bipartisan legislation (S.B. 1017) authored by state Sen. Ben Allen in 2018 that established a transition program that provides financial compensation to drift gillnet fishermen who voluntarily turn in their permits and nets for destruction. Participating active drift gillnet fishermen receive $110,000 and become first in line for federal permits for deep-set buoy gear, a proven clean and profitable method for catching swordfish. Earlier this year, the California Ocean Protection Council allocated the first $1 million to the fund, making this opportunity available to drift gillnet fishermen on a first come, first served basis. Over 90% of the remaining active drift gillnet fishermen have indicated their willingness to participate in the program, and the first fishermen turned in their nets and permits in August 2020.

Now that Oceana has deposited an additional $1 million in funding into the state account, California law activates a four-year phaseout of all remaining state drift gillnet permits, which will end any remaining drift gillnet fishing by January 31, 2024. California is the only state in the U.S. that still allows drift gillnets to catch swordfish. The California Department of Fish and Wildlife implements the transition program, and the fund is managed by the Pacific States Marine Fisheries Commission.

"Oceana is proud to be part of a collaborative partnership and solution to finally end the use of destructive drift gillnets off of California," said Susan Murray, Oceana's deputy vice president for the Pacific. "This solution allows a safe landing for the fishermen while protecting countless whales, sea turtles, dolphins and other sea life from needless suffering and death."

There are two state-approved net destruction entities that will be collecting nets from participating fishermen and recycling them into a variety of products from sunglasses to skateboards. Oceana has also partnered with Gray Whale Gin to raise awareness about the fund.

Anyone who wishes to help complete the transition away from drift gillnets can make a tax-deductible donation at www.oceana.org/StopTheNetsDonate. Oceana transfers 100% of all donations received to the state transition fund.

Oceana continues to push for complementary federal legislation (S. 906) introduced by Sen. Dianne Feinstein (D-Calif.) to end federal drift gillnet permits, which passed the U.S. Senate and is now in the U.S. House of

Representatives. Oceana has also intervened in a federal lawsuit to maintain limits on the unintentional catch of whales and sea turtles during the transition period.

For more information about Oceana's campaign to transition away from drift gillnets, please visit www.oceana.org/StopTheNets.

Oceana is the largest international advocacy organization dedicated solely to ocean conservation. Oceana is rebuilding abundant and biodiverse oceans by winning science-based policies in countries that control one-third of the world's wild fish catch. With more than 225 victories that stop overfishing, habitat destruction, pollution, and the killing of threatened species like turtles and sharks, Oceana's campaigns are delivering results. A restored ocean means that 1 billion people can enjoy a healthy seafood meal, every day, forever. Together, we can save the oceans and help feed the world. Visit www.usa.oceana.org to learn more.

OCEANA Protecting the World's Oceans

PRESS RELEASE

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Monterey, CA 93940 USA

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OCEANA.ORG

For Immediate Release: September 14, 2020

Contacts: Geoff Shester, 831.207.6981, gshester@oceana.org
Jamie Karnik, 907.635.8722, jkarnik@oceana.org

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MONTEREY, Calif. — Today, Oceana delivered $1 million to California to help end the state's deadly drift gillnet fishery. The funds, which were made possible by generous donations from the Marisla Foundation, Cinco Hermanos Fund, Offield Family Foundation, and Sue J. Gross Foundation, as well as several families and individuals, match the state's contribution to fund a transition for fishermen who hand in their nets and relinquish their drift gillnet permits. These drift gillnets — which are a mile long, nearly invisible and set out overnight near the ocean's surface to capture swordfish — are responsible for entangling, injuring and killing whales, dolphins, sea lions, sea turtles, sharks and other important non-targeted fish species.

"We are absolutely thrilled at this news, especially after so many long-fought years of campaigning. It is a true blessing to know that our children and grandchildren will grow up with a California ocean free of deadly drift gillnets. We are so thankful to the donors who generously contributed funds toward this innovative transition program that will save whales, sea turtles and other ocean wildlife by removing harmful drift gillnets from our oceans, and provide opportunities for California fishermen to catch swordfish with more selective methods like deep-set buoy gear," said Geoff Shester, Oceana's California campaign director. "We commend local fishermen for being part of the solution and are glad to see them receive financial assistance during these challenging times."

After years of campaigning by Oceana and others, California passed bipartisan legislation (S.B. 1017) authored by state Sen. Ben Allen in 2018 that established a transition program that provides financial compensation to drift gillnet fishermen who voluntarily turn in their permits and nets for destruction. Participating active drift gillnet fishermen receive $110,000 and become first in line for federal permits for deep-set buoy gear, a proven clean and profitable method for catching swordfish. Earlier this year, the California Ocean Protection Council allocated the first $1 million to the fund, making this opportunity available to drift gillnet fishermen on a first come, first served basis. Over 90% of the remaining active drift gillnet fishermen have indicated their willingness to participate in the program, and the first fishermen turned in their nets and permits in August 2020.

Now that Oceana has deposited an additional $1 million in funding into the state account, California law activates a four-year phaseout of all remaining state drift gillnet permits, which will end any remaining

drift gillnet fishing by January 31, 2024. California is the only state in the U.S. that still allows drift gillnets to catch swordfish. The California Department of Fish and Wildlife implements the transition program, and the fund is managed by the Pacific States Marine Fisheries Commission.

"Oceana is proud to be part of a collaborative partnership and solution to finally end the use of destructive drift gillnets off of California," said Susan Murray, Oceana's deputy vice president for the Pacific. "This solution allows a safe landing for the fishermen while protecting countless whales, sea turtles, dolphins and other sea life from needless suffering and death."

There are two state-approved net destruction entities that will be collecting nets from participating fishermen and recycling them into a variety of products from sunglasses to skateboards. Oceana has also partnered with Gray Whale Gin to raise awareness about the fund.

Anyone who wishes to help complete the transition away from drift gillnets can make a tax-deductible donation at www.oceana.org/StopTheNetsDonate. Oceana transfers 100% of all donations received to the state transition fund.

Oceana continues to push for complementary federal legislation (S. 906) introduced by Sen. Dianne Feinstein (D-Calif.) to end federal drift gillnet permits, which passed the U.S. Senate and is now in the U.S. House of Representatives. Oceana has also intervened in a federal lawsuit to maintain limits on the unintentional catch of whales and sea turtles during the transition period.

For more information about Oceana's campaign to transition away from drift gillnets, please visit www.oceana.org/StopTheNets.

Oceana is the largest international advocacy organization dedicated solely to ocean conservation. Oceana is rebuilding abundant and biodiverse oceans by winning science-based policies in countries that control one-third of the world's wild fish catch. With more than 225 victories that stop overfishing, habitat destruction, pollution, and the killing of threatened species like turtles and sharks, Oceana's campaigns are delivering results. A restored ocean means that 1 billion people can enjoy a healthy seafood meal, every day, forever. Together, we can save the oceans and help feed the world. Visit www.usa.oceana.org to learn more.

CDFW Seeks Authority to Refund Elk, Pronghorn Tags for Areas Impacted by Wildfires, Forest Closures

September 21, 2020

The California Department of Fish and Wildlife (CDFW) is pursuing a regulation change that would allow elk and pronghorn (antelope) hunters whose seasons were cut short or eliminated due to wildfires and forest closures to receive a refund of their 2020 tag fees along with a restoration of their preference points used to acquire their tags. Eligible hunters would also receive an additional preference point for elk or pronghorn for the 2020 season.

“We need to do right by these hunters who have lost most if not all of their hunting opportunity in 2020 due to these unprecedented forest closures and wildfires,” said CDFW Director Charlton H. Bonham. “These are expensive tags that can take many years – sometimes a lifetime – to draw. Refunding tag fees and restoring preference points is the least we can do for this group that does so much to fund our scientific research and conservation of these iconic California species.”

The proposed change to the California Code of Regulations must be approved by the California Fish and Game Commission. On Thursday, Sept. 17, the Commission’s Wildlife Resources Committee approved the proposed regulation concept, which is expected to be taken up by the full Commission in December and if approved, would go into effect in April 2021.

The proposed regulation identifies 14 elk hunts and two pronghorn hunts whose tag holders would be eligible for a refund of tag fees and a restoration of their preference points after submitting their unused tag along with a signed statement that they were unable to hunt for the entire season or a significant portion of the season due to the statewide closure of national forests and other affected lands as a result of the September 2020 wildfires.

The 14 elk hunts eligible for tag refunds would be:

- Marble Mountains Either-Sex Apprentice (Roosevelt), Sept. 9-20
- Northeastern California Archery Either Sex (Rocky Mountain), Sept. 2-13
- Marble Mountains Antlerless (Roosevelt), Sept. 9-20
- Marble Mountain Bull (Roosevelt), Sept. 9-20
- Northwestern California Antlerless (Roosevelt), Sept. 2-24
- Northwestern California Bull (Roosevelt), Sept. 2-24
- Siskiyou Antlerless (Roosevelt), Sept. 9-20
- Siskiyou Bull (Roosevelt), Sept. 9-20

- East Park Reservoir Antlerless (Tule), Sept. 5-Oct. 1
- East Park Reservoir Bull (Tule), Sept. 5-Oct. 1
- Lake Pillsbury Period 1 Antlerless (Tule), Sept.9-18
- Northeastern California Either-Sex Apprentice (Rocky Mountain), Sept. 16-27
- Northeastern California Bull (Rocky Mountain), Sept. 16-27
- Northwestern California Either-Sex (Roosevelt), Sept. 2-24

The two pronghorn hunts eligible for tag refunds would be:

- Zone 4 Lassen Period 2 General Buck, Sept. 5-13
- Zone 3 Likely Tables Period 2 General Buck, Sept. 5-13

The proposed regulation does not include a refund for deer tag holders, whose hunting seasons generally are longer and whose tags are less expensive. Some premium deer tags may be returned to CDFW with a request to have preference points reinstated and one preference point awarded for the species for the current hunt year prior to the season opening. Tag return and preference point eligibility requirements and additional information is available on **CDFW's website**.

A California resident elk tag costs $461.50, not including application and processing fees. A California resident pronghorn tag costs $155.27, not including application and processing fees. Application and processing fees would not be eligible for refunds. Hunting license fees similarly cannot be refunded.

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Media Contact:
***Peter Tira**, CDFW Communications, (916) 215-3858*

California Fish and Game Commission Tribal Committee (TC)

Work Plan: Scheduled Topics and Timeline for Items Referred to TC by the California Fish and Game Commission

Updated August 21, 2020

Topic / Goal	Type / Lead	Aug 2020	Nov 2020	Apr 2021
Special Projects				
Co-management: Implementation, potential changes to definition	TC Project	X	X	X
Coastal Fishing Communities Project: Updates	MRC Project	X	X	X
Regulatory / Legislative				
Kelp and algae harvest management regulations: Updates and then recommendation and guidance	DFW Project and Regulation Change	X	X	X
Developing Management Issues				
FGC Climate Policy: During development of policy, make recommendations and provide guidance	FGC Policy			
Management Plans				
Sheep, deer, antelope, trout, abalone, kelp/seaweed: Updates and guidance (timing as appropriate for each)	DFW	X	X	X
Informational Topics				
Studies of pinnipeds and California's fisheries: What studies have been conducted, how they affect California's fisheries, and options for addressing impacts	DFW	X	X	
Marine Protected Areas Statewide Leadership Team (MSLT): Update on tribal participation in MSLT and implementation of the MSLT work plan	OPC Project		X	
Wildfire impacts and state response: Update as requested	DFW		X	
Statewide kelp recovery efforts: Update as requested	DFW			
Kelp recovery efforts at Casper Cover and Tankers Reef			X	
Annual tribal planning meeting: Review topics discussed at annual meeting	FGC	X	X	X
Cross-pollination with MRC and WRC: Identify tribal concerns and common themes with WRC and MRC	FGC Committees	X	X	X
FGC regulatory calendar: Update	FGC staff	X	X	X
Status of abalone recovery: Update as requested	DFW			
Proposition 64 (cannabis): Update as requested	DFW			
West Coast Ocean Alliance Tribal Caucus: Presentation and discussion regarding its work to enhance coordination and management for the ocean along the West Coast	FGC staff	X		

Key: X = Discussion scheduled X/R = Recommendation developed and moved to FGC

FGC = California Fish and Game Commission *MRC = FGC's Marine Resources Committee*

DFW = California Department of Fish and Wildlife *WRC = FGC's Wildlife Resources Committee*

California Fish and Game Commission
Marine Resources Committee (MRC) Work Plan
Scheduled Topics and Timeline for Items Referred to MRC
Updated September 4, 2020

TOPIC	CATEGORY	JUL 2020	NOV 2020	MAR 2021
Planning Documents & Fishery Management Plans (FMPs)				
MLMA Master Plan for Fisheries - Implementation Updates	Master Plan Implementation	X	X	X
Red Abalone FMP / ARMP Update	FMP	X/R	X	X
California Halibut FMP (TBD)	FMP			
Regulations				
Experimental Fishing Permit Program, Phase II	Fisheries	X/R		
Kelp and Algae Commercial Harvest	Kelp		X	X/R
Update on and possible review of California Spiny Lobster FMP implementing regulations (*added Feb 2019; timing TBD*)	FMP			
Maintenance of Preexisting Structures Within Marine Protected Areas	Marine Protected Areas	X	X/R	
California Grunion Recreational Fishing Regulations	Fisheries	X	X/R	
Aquaculture				
Aquaculture Program Planning (Information Report, Action Plan)	Planning Document		X	
Aquaculture State Water Bottom Leases: Existing & Future Lease Considerations	Current leases/planning			
Moratorium on New Aquaculture Lease Applications	New Leases		X/R	
Aquaculture Lease Best Management Practices (BMP) Plan Requirements (HOLD, TBD)	Regulations			
Emerging/Developing Management Issues				
Kelp Restoration and Recovery Tracking	Kelp		X	
Recreational Swordfish Fishing Regulations				
Special Projects				
California's Coastal Fishing Communities	MRC Special Project	X	X	

KEY:

X Discussion scheduled

X/R Recommendation developed; topic generally moved to FGC

STAFF SUMMARY FOR AUGUST 22-23, 2018
FOR BACKGROUND PURPOSES ONLY

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

- **Today's notice hearing** **Aug 22-23, 2018; Fortuna**
- 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 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.

State of California
Department of Fish and Wildlife

M e m o r a n d u m

Original on file, received August 6, 2020

Date: August 6, 2020

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: **Agenda Item for the August 19-20, 2020 Fish and Game Commission Meeting - Initial Statement of Reasons to Amend Section 29.15 Re: Recreational Abalone Closure**

The Department of Fish and Wildlife (Department) requests the Fish and Game Commission (Commission) authorize publication of notice of its intent to amend regulations for the recreational abalone fishery to extend the fishery closure sunset date by an additional five years from April 1, 2021 to April 1, 2026. Authorization of this request will allow for possible adoption at the December 9, 2020 meeting.

The Department is submitting the attached Initial Statement of Reasons (ISOR) to extend the closure sunset date for an additional five years. This proposal is based on data that indicate the abalone resource and current environmental conditions remain unchanged since adoption of the closure in 2017. In addition, the Department has been engaged with stakeholders to develop a Red Abalone Fishery Management Plan (FMP). It is expected that the FMP and associated implementing regulations will be completed well before 2026.

If you have any questions or need additional information, please contact Dr. Craig Shuman, Marine Regional Manager at (916) 373-5491. The public notice for this rulemaking should identify Senior Environmental Scientist Specialist, Ian Taniguchi as the Department's point of contact. His contact information is (562) 342-7182 or Ian.Taniguchi@wildlife.ca.gov.

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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 Abalone Closure

I. Date of Initial Statement of Reasons: July 20, 2020

II. Dates and Locations of Scheduled Hearings

(a) Notice Hearing

Date: August 19, 2020 Location: Webinar/ Teleconference

(b) Discussion Hearing

Date: October 14, 2020 Location: Webinar/ Teleconference

(c) Adoption Hearing

Date: December 9, 2020 Location: Webinar/ Teleconference

III. Description of Regulatory Action

(a) Statement of Specific Purpose of Regulatory Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary

Red abalone (*Haliotis rufescens*) is a resource 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 and adopted the ARMP in 2005.

Red abalone are herbivores that live on rocky reefs in kelp forests, eating red and brown algae. Starting in 2014, a combination of unprecedented environmental and biological stressors, including warmer-than-normal waters and decreasing food resources leading to starvation conditions, began to negatively impact abalone populations. Since then, the Department has actively conducted surveys, visual assessments, and histological sampling of north coast abalone, and received citizen reports of unhealthy or moribund abalone within the fishery. In the September 2017 Initial Statement of Reasons for Regulatory Action (Commission, 2017) the Department identified wide-sweeping changes in the density, occurrence, size and health of red abalone and the kelp upon which it depends for food.

Due to the sharp decline of abalone, the expanding urchin barren, and the dwindling kelp stands throughout the state, the Commission adopted emergency regulations in 2016 to reduce the season by two months and the per-person annual take limit from 18 to 12 (Office of Administrative Law (OAL) rulemaking file 2016-1216-01E). Scientific research conducted by

Department staff continued to document the extent of the degradation experienced by the stock and the environment. In 2017, the Commission closed the fishery until 2021 through a regular rulemaking (OAL rulemaking file 2018-0329-01SR).

Since the closure of the recreational fishery, the Department has found no meaningful changes in conditions of the abalone resource or environment as described in the September 2017 Initial Statement of Reasons for Regulatory Action (Commission, 2017). Surveys at selected coastal sites in late summer and early fall of 2019 show no evidence of improved conditions, with bull kelp coverage still significantly lower than historical average (Figure 1). Recent analysis suggests that the red abalone stock is not expected to be able to sustain even a *de minimis* fishery for another 9-11 years. A fishery management plan (FMP) for red abalone is currently under development by the Department and stakeholders to guide future management actions for the northern California recreational fishery, separate from the ARMP. The FMP is expected to be completed and adopted before 2026, at which point Section 29.15 will likely be amended to accommodate the implementing regulations of the FMP.

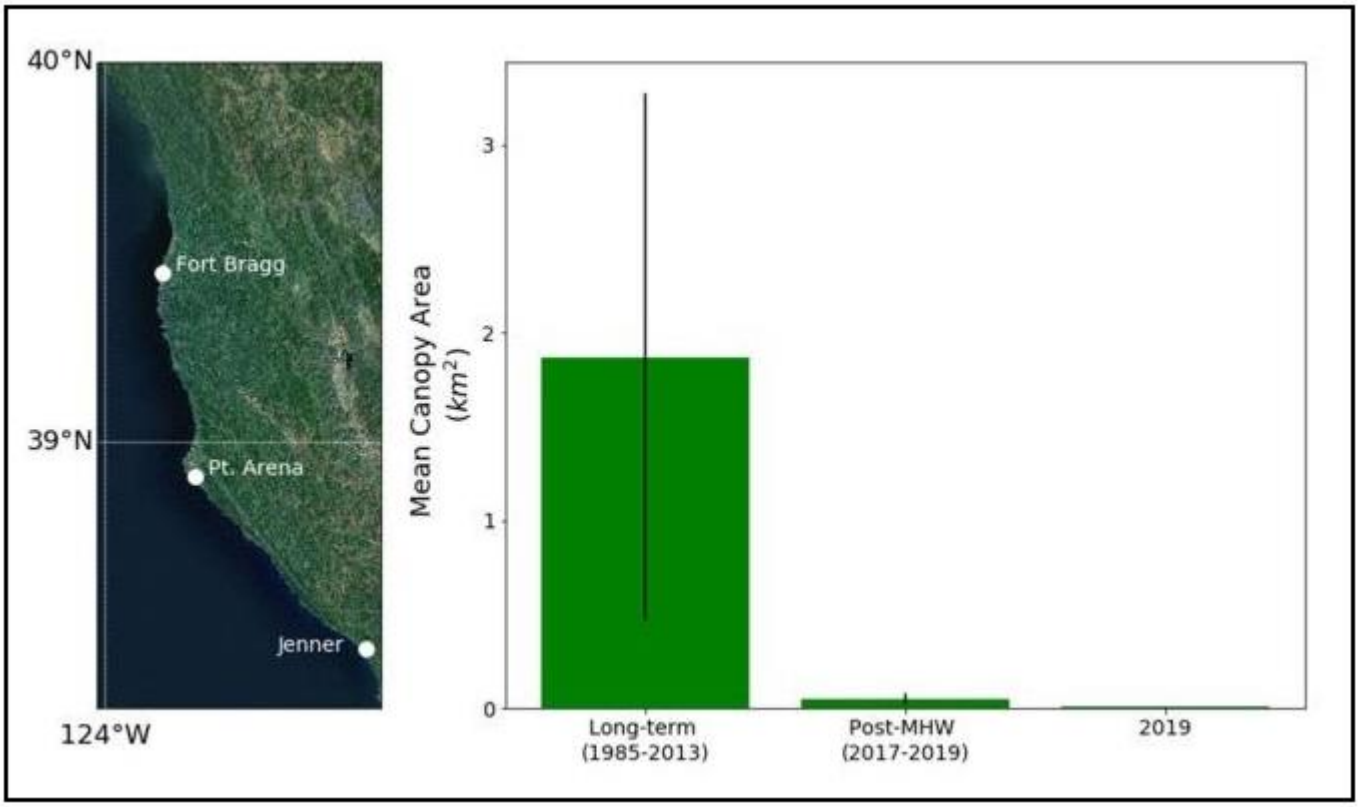

Figure 1. Mean Bull Kelp Coverage in Northern California in km^2 before Marine Heat Wave (MHW), after MHW, and in 2019 (Source: McPherson et al., 2020).

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. The closure

is in effect until April 1, 2021 under subsection 29.15 (j). If the regulations are not amended to delete or extend that date, the fishery will re-open on April 1, 2021, which will allow for the recreational take of abalone in open fishing areas during the open season (current subsections 29.15(a), (b), and (c)).

Proposed Amendment - Subsections 29.15 (a)-(c), (i) and (j)

Extend the Sunset Date

The Commission is proposing to extend the sunset date of the closure in Section 29.15 by replacing the effective year of 2021 with the year 2026 in current subsections 29.15 (a), (b), (c) and (j). Delaying the reopening date is necessary because without the delay, the fishery will re-open while the stock is still in a vulnerable state, which would be detrimental to the recovery of the red abalone population. The April 1, 2018 effective date listed in current subsection (i) will also be removed since the closure is already in place.

The red abalone population is not expected to recover by 2026; however, Department staff has been engaging with stakeholders since 2014 to draft a comprehensive FMP. The FMP is expected to be completed before 2026 and will include implementing regulations which will amend Section 29.15. Language pertaining to the current closure is expected to be included as part of the implementing regulations of the FMP.

Rearrange Order of Subsections

The proposal would also rearrange the order of current subsections (a), (b), (c), (i) and (j) and would split current subsection (i) into two subsections. The relocated language from subsection (a) to subsection (j), from subsection (b) to subsection (k), and from subsection (j) to subsection (b) is unchanged except the date change described above and updates to the cross references to reflect the rearrangement of the subsections. The relocated language from subsection (i) to subsections (a) and (c) is unchanged except for the removal of the words “Effective April 1, 2018” and the amendments to clarify the exceptions for abalone taken prior to April 1, 2018. This re-ordering of the subsections places the requirements effective 2026 in sequence, and the requirements for abalone taken prior to the closure April 1, 2018 in sequence in the regulation text. This rearrangement in language is necessary to improve clarity, emphasize the fishery closure, and aid with enforcement.

Repeal Requirement to Retain All Detached Legal Size Abalone

Subsection 29.15(d) specifies the minimum size limit for red abalone and states that all legal size abalone detached must be retained. The proposed regulation will repeal the requirement to retain detached legal size abalone. This change is necessary for consistency with subsection (a) which prohibits take and possession of abalone.

(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

Jackson, A., Berube, P., Taniguchi, I., Likins, J., Silva, J., Pope, E., and S. Mastrup. 2020. *Summary of the Management Strategy Integration Process for the North Coast Recreational Red Abalone Fishery Management Plan*. Administrative Team Report to the California Fish and Game Commission. 115 pp. Available from: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178566&inline

McPherson, Finger, Housekeeper, Bell, Carr, Rogers-Bennett, & Kudela. 2020. Paper Under Review (Analyzes kelp coverage data gathered from Northern California from 1985-2019).

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. Available from: https://fgc.ca.gov/Regulations/2017-New-and-Proposed#29_15S

Abalone Recovery and Management Plan
https://www.wildlife.ca.gov/Conservation/Marine/ARMP

(f) Public Discussions of Proposed Regulations Prior to Notice Publication

The poor conditions of the red abalone populations have been well-known and have been discussed extensively in previous rulemakings. The subject was discussed during the August 2017, October 2017, December 2017, August 2018, October 2018, and December 2018 Commission meetings. The present action to extend the sunset date from 2021 to 2026 has been discussed at the June 24, 2020 Commission meeting, as well as during a pre-notice outreach webinar with the Red Abalone Advisory Committee on July 11, 2020.

IV. Description of Reasonable Alternatives to Regulatory Action

(a) Alternatives to Regulation Change

Elimination of the sunset date was rejected due to stakeholders' opposition to an indefinite fishery closure. No other alternatives have been 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 red abalone populations will be open to recreational take in 2021 to the detriment of the fishery's recovery.

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. The regulatory action will not impact compliance costs or fishery activity due to the existing closure and 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 within the state, the creation of new businesses, the elimination of existing businesses or worker safety. The Commission anticipates generalized benefits to the health and welfare of California residents and benefits to the state's environment. The proposed action continues an existing closure designed to ensure the long-term sustainability and quality of the fishery, promoting future 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

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 any negative impacts on the creation or elimination of jobs within the state. The abalone fishery has been closed since April 1, 2018. No change in employment is anticipated in direct relation to the proposed extension through 2026. The proposed extension is designed to ensure the long-term sustainability and quality of the fishery, promoting future 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 any impacts on the creation of new businesses or the elimination of existing businesses within the state. The abalone fishery has been closed since April 1, 2018. No change is anticipated in relation to the creation of new businesses or the elimination of existing businesses within the state from the proposed action. Continuing the fishery closure is proposed to support the long-term sustainability of the abalone resource and, thus, the future viability of the fishery that may 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 any impacts on the expansion of businesses currently doing business within the state. The abalone fishery has been closed since April 1, 2018. Continuing the fishery closure is proposed to support the long-term sustainability of the abalone resource and, thus, the future viability of the fishery that may 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

(e) Benefits of the Regulation to Worker Safety

None. The proposed regulation does not impact working conditions

(f) Benefits of the Regulation to the State's Environment

The Commission anticipates benefits to the state's environment. 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" (Fish and Game Code Section 7050(b)). The proposed regulation will benefit the state's environment by helping to ensure sustainable populations of red abalone for fishery and ecosystem management.

Informative Digest/Policy Statement Overview

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. The closure is currently set to expire on April 1, 2021.

The Fish and Game Commission (Commission) is proposing to extend the sunset date of the closure to April 1, 2026. A five-year extension of the sunset is expected to allow sufficient time for completion of the Red Abalone Fishery Management Plan and associated implementing regulations. In addition, the proposal will reorganize the subsections of Section 29.15 and update cross references to reflect that reorganization. The proposed regulation will also repeal the requirement in subsection (d) that states all legal size abalone detached must be retained.

Benefits of the Regulations

The proposed regulation will benefit the state's environment by helping to ensure sustainable populations of red abalone for fishery and ecosystem management.

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 regulations are consistent with other recreational fishing regulations and marine protected area regulations in Title 14, CCR, and therefore has determined that the proposed regulation is neither inconsistent nor incompatible with existing state regulations.

Proposed Regulatory Language

Section 29.15, Title 14 CCR, is amended to read:

§29.15. Abalone

~~(a) Effective April 1, 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 38º30.63' N, 123º14.98' W (the northern point of Fort Ross Cove) and a line drawn due west true from 38º29.45' N, 123º11.72' W (Jewel Gulch, south boundary Fort Ross State Park).~~

~~(b) Effective April 1, 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, 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.~~

(a) All ocean waters are closed to the take of abalone. Abalone may not be taken or possessed.

(b) This subsection and subsection (a) shall remain in effect only until April 1, 2026, and as of that date are repealed, unless a later enacted amendment deletes or extends that date.

(c) Notwithstanding subsection (a), subsections (c)(1) and (c)(2) are applicable 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.

(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, 2018, and as of that date are repealed, unless a later enacted amendment deletes or extends that date.~~

(i) Effective April 1, 2026: 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(j) and 29.15(j)(1), not more than 9 abalone of the yearly trip limit may be taken south of the boundary between Sonoma and Mendocino Counties.

(j) Effective April 1, 2026: Open Area: Except in the area described in subsection (j)(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 38º30.63' N, 123º14.98' W (the northern point of Fort Ross Cove) and a line drawn due west true from 38º29.45' N, 123º11.72' W (Jewel Gulch, south boundary Fort Ross State Park).

(k) Effective April 1, 2026: 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.

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.

From: Rick Meyer
Sent: Sunday, September 20, 2020 1:14 PM
To: FGC <FGC@fgc.ca.gov>
Subject: RE: Revised materials available for Commission's September 22, 2020meeting

Warning: This email originated from outside of CDFW and should be treated with extra caution.

Its not right what Ca, fish and game did to Abalone season. There are so many abalone out there, there is enough for everyone. Liberal IDIOTS have taken over fish and game. You guys really SUCK at what you do. Fred Meyer

STAFF SUMMARY FOR AUGUST 19-20, 2020
For background purposes only.

11. RECREATIONAL DUNGENESS CRAB*

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

Consider authorizing publication of notice of intent to amend recreational take of Dungeness crab regulations intended to provide additional whale and turtle protections in the trap fishery.

**Note that DFW is proposing the regulations apply to all crab species.*

Summary of Previous/Future Actions

• FGC/MRC considered management measures for the recreational fishery	April 2019 – Feb 2020; various locations
• MRC update and recommendation	Mar 17, 2020; MRC, Santa Rosa/ Webinar/Teleconference
• FGC approved MRC recommendations	Apr 15-16, 2020; Teleconference
• FGC direction on regulatory options and continuation of notice hearing to Aug 2020	Jun 24-25, 2020; Webinar/Teleconference
• MRC received DFW update regarding crab species for rulemaking	Jul 29, 2020; MRC, Webinar/Teleconference
• **Today's notice hearing**	**Aug 19-20, 2020; Webinar/Teleconference**
• Discussion hearing	Oct 14-15, 2020; Webinar/Teleconference
• Adoption hearing	Dec 11-12, 2019; Sacramento

Background

In early 2019, FGC initiated discussions about potential management measures for the recreational Dungeness crab fishery to minimize risks of whale entanglements in fishing gear. Management options developed by DFW were explored and refined at various FGC and MRC meetings in 2019 and 2020, culminating in FGC action in Apr 2020 to schedule a rulemaking to commence in Jun 2020.

In Apr 2020, FGC approved including MRC-recommended management measures in the proposed regulations and requested that DFW return to the Jun notice hearing with more specific criteria and considerations for four items (Exhibit 2). At its Jun 2020 meeting, FGC approved including three of the four measures in the proposed regulations and continued the notice hearing to its Aug 2020 meeting to allow time for DFW to integrate the direction into the proposal (see exhibits 1 and 2 for additional background information).

Update

At the Jul 2020 MRC meeting, DFW reported that its Law Enforcement Division had identified a potential regulatory loophole related to targeting other crab species, such as rock crab. Other crab species can co-occur and be harvested by trap when fishing for Dungeness crab. As a result, DFW will recommend to FGC today that the proposed regulation apply to all crab

species to ensure effective enforcement of the new regulation. DFW will provide additional information during today's meeting.

Proposed Regulations

The proposed regulations in Exhibit 4 include several provisions:

- *Enhanced Gear Marking:* Require all recreational crab traps to be marked with a main buoy of 5 x 11 inches and a red marker buoy of 3 x 5 inches attached no more than three feet from the main buoy. Current regulations requiring buoy marking and, in the case of commercial passenger fishing vessels (CPFVs), trap marking, would be consolidated in this subsection.
- *Service Interval:* Establish a maximum trap service interval of 9 days, weather conditions at sea permitting, and prohibit abandoning crab traps in state waters.
- *Trap Limit:* Establish a trap limit of 10 traps per individual with a provision to allow an individual to service up to 10 additional traps if the individual possesses written permission from the operator(s) of the additional traps. Also, the current 60-trap limit for CPFVs targeting Dungeness crab would apply to CPFVs targeting any crab and be consolidated into the same subsection.
- *Director Authority*: Provide authority for the DFW director to delay the fishery opener or close the season early when the concentrations of Humpback whales, blue whales, or Pacific leatherback sea turtles exceed thresholds established in the DFW Risk Assessment and Mitigation Program (RAMP). Any delay or closure could apply statewide or by zone. Before implementing a delay or closure, DFW would provide at least five days' notice to the recreational crab trap fishery through a director's declaration on DFW's "Whale Safe Fisheries" webpage.
- *Trap Validation Program*: Establish a "Recreational Crab Trap Validation" program that would (1) require anyone who fishes for crab with recreational crab traps to purchase an annual validation and (2) establish a small fee of $2.25 for each validation.

Staff notes that during previous meetings, FGC and MRC discussed two additional criteria governing DFW director action to implement a delay or closure under the director authority provisions: (1) consulting with the FGC president prior to taking action to delay or close a season, and (2) notifying FGC at its next meeting of any action taken; however, the motion adopted by FGC in Jun 2020 did not specify these criteria. Staff requests clarification from FGC regarding inclusion of the provisions in the proposed regulations.

Significant Public Comments (N/A)

Recommendation

FGC staff: Determine whether to incorporate the provisions for consultation and notification to the DFW director authority provision as described above, apply proposed regulations to all crab species as recommended by DFW, and authorize publication of the notice as proposed.

DFW: Apply the proposed regulations to other crab species in addition to Dungeness crab, and

authorize publication of a notice of intent to amend recreational crab fishing regulations, as described in the initial statement or reasons (ISOR) (Exhibit 4).

Exhibits

1. Staff summary from Mar 17, 2020 MRC meeting (for background purposes)
2. Staff summary from Jun 24-25, 2020 FGC meeting (for background purposes)
3. DFW memo, received Aug 12, 2020
4. Draft initial statement of reasons
5. Draft economic and fiscal impact statement (Std. 399)
6. DFW presentation

Motion/Direction

Moved by _____ and seconded by _____ that the Commission authorizes publication of a notice of its intent to amend sections 29.80, 29.85 and 701, related to recreational crab fishing regulations as proposed in the initial statement of reasons.

OR

Moved by _____ and seconded by _____ that the Commission authorizes publication of a notice of its intent to amend sections 29.80, 29.85 and 701, related to recreational crab fishing regulations as proposed in the initial statement of reasons with the addition of language:

(1) requiring the Department director to consult with the Commission president prior to taking action to implement a season delay or closure,

AND/OR

(2) requiring the Department director to notify the Commission of any actions taken under the director's authority at the next Commission meeting.

State of California
Department of Fish and Wildlife

Received August 12, 2020
Original signed copy on file.

M e m o r a n d u m

Date: August 11, 2020

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: **Submission of Initial Statement of Reasons for Agenda Item for the August 19-20, 2020 Fish and Game Commission Meeting - RE: Amend Sections 29.80, 29.85 and 701, Recreational Crab Marine Life Protection Measures**

The Department of Fish and Wildlife (Department) requests the Fish and Game Commission (Commission) authorize publication of notice of its intent to amend regulations for the recreational crab fishery to include management measures to reduce the risk of marine life entanglement. Authorization of this request will allow for discussion at the October 14, 2020 Commission meeting, and possible adoption at the December 9, 2020 Commission meeting.

The Department is submitting the attached Initial Statement of Reasons (ISOR) supporting proposed regulations to require enhanced trap gear marking, a nine-day service interval for checking traps, a limit of 10 traps per individual angler, the addition of a trap validation program, and the provision for the Director of the Department to delay the season or take in-season management action to minimize entanglement risk.

The Department recommends adoption of the marine life protection measures in this rulemaking. They are consistent with measures the Department has already employed or is in progress of employing for the commercial Dungeness crab fishery to protect large whales and sea turtles under the Risk Assessment Mitigation Program.

If you have any questions or need additional information, please contact Dr. Craig Shuman, Marine Regional Manager at (916) 373-5491. The public notice for this rulemaking should identify Senior Environmental Scientist Specialist, Ryan Bartling as the Department's point of contact. His contact information is (415) 761-1843 or Ryan.Bartling@wildlife.ca.gov.

ec: Stafford Lehr, Deputy Director
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State of California
Fish and Game Commission
Initial Statement of Reasons for Regulatory Action

Amend Sections 29.80, 29.85, and 701
Title 14, California Code of Regulations
Re: Recreational Crab Trap Fishery Marine Life Protection Measures

I. Date of Initial Statement of Reasons: September 10, 2020

II. Dates and Locations of Scheduled Hearings

(a) Notice Hearing

Date: August 19, 2020 Location: Webinar/Teleconference

(b) Discussion Hearing

Date: October 14, 2020 Location: Webinar/Teleconference

(c) Adoption Hearing

Date: December 9, 2020 Location: Webinar/Teleconference

III. Description of Regulatory Action

(a) Statement of Specific Purpose of Regulatory Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary

Unless otherwise specified, all section references in this document are to Title 14 of the California Code of Regulations (CCR).

In the last several years, there has been an increase in the number of reported entanglements of marine life with fishing gear on portions of the Pacific coast. Between 2014 and 2019, three Humpback whale entanglements were attributed to the recreational crab fishery in California. (Saez et al. 2020; National Oceanic Atmospheric Administration [NOAA] Fisheries, 2020). The California Fish and Game Commission (Commission) has worked with the California Department of Fish and Wildlife (Department; CDFW) and with numerous stakeholders to identify the underlying issues and proposed solutions for minimizing risk of entanglement of marine life with fishing gear. This regulatory proposal is part of the state's ongoing efforts to reduce marine life entanglements, particularly entanglements of whales and sea turtles protected and/or listed under the federal Endangered Species Act (ESA). These proposed regulations would help minimize risk of entanglement through a management response and also help collect essential baseline information for future response to entanglement risk for the recreational crab sector. The proposed regulations include five elements: enhanced gear marking, trap servicing interval, traps limits, delegated management authority, and a validation program.

There are similarities between the California recreational (sport) fishery and the commercial fishery for Dungeness and other crabs. The California recreational crab fishery uses traps to

target primarily Dungeness crab, with rock crabs being targeted in some areas and taken incidentally in others. The recreational crab fishery uses similar gear as the commercial Dungeness crab fishery and overlaps with both the commercial fishing areas and the commercial fishing season (CDFW, 2019). The California commercial Dungeness crab fishery has specific licensing and reporting requirements, providing data on fishing location and landings, and commercial operators abide by a specified service interval when traps must be raised, cleaned and emptied. Unlike it does for the commercial Dungeness crab fishery, the Department has very little information on the recreational crab fishery, including information on the levels of take or effort.

Identifying the fishery responsible for an entanglement is essential to reducing future incidences. The current marking requirements for the recreational crab fishery are less stringent than those for the commercial crab fisheries. Buoy(s) attached to a recreational crab trap must be marked with the operator's GO ID (i.e., the "Get Outdoors Identification number", a unique number issued by the Automatic License Data System (ALDS) that is permanently tied to an individual), or, when deployed from a Commercial Passenger Fishing Vessel (CPFV), the CPFV's commercial boat registration number. However, the GO ID and CPFV numbering does not have a specific number size requirement, making the numbers difficult or impossible to read from a distance. As such, the ability to distinguish recreational crab trap gear from other fishing gear during a marine life entanglement response is limited. In contrast, commercial Dungeness crab trap buoys must be marked with state-issued buoy tags, which are more easily observed on entanglements involving commercial gear.

Furthermore, while fishing buoys used by commercial fishermen are relatively standardized, the recreational sector is not required under current regulations to use a certain buoy type. Thus, the recreational sector uses a variety of floatation devices, leading to inconsistency that also makes recreational gear difficult to identify during entanglement events.

The proposed regulatory changes are designed to implement simple, common-sense measures intended both to minimize the risk of entanglements in recreational crab fishing gear and to gather baseline information towards informing mitigation measures and future fishery management actions. The proposed regulations would apply to the recreational take of any crabs by trap.

The proposed regulations introduce five elements for the recreational crab fishery:

- enhanced gear marking with a more defined surface marker buoy system,
- an interval during which traps must be retrieved for servicing,
- a per-individual trap limit of 10 traps for each recreational crab trap operator,
- delegation of authority from the Commission to the Department's Director to allow modifications to the season to help minimize entanglements in the recreational crab fishery, and
- a validation ("stamp") program to allow collection of essential fishery information.

CURRENT REGULATIONS

Current regulations for rock crab and Dungeness crab specify seasons, size limits, bag and possession limits, closed fishing areas, and gear restrictions. Like most recreational fisheries, a recreational fishing license is the only license required to participate in recreational crab

fishing. In addition to traps, crabs can also be taken recreationally by hand, crab loop traps (snares), or hoop nets. Individuals are generally not allowed to operate a trap owned by another person unless they have in possession written permission from the owner.

Individual fishermen may fish using their own gear, or may join a scheduled fishing trip on a CPFV. CPFVs take customers on fishing trips and provide fishing gear for use by their clients or passengers. Subsection 29.85(a)(4) restricts the number of crab traps used to take Dungeness crab by a CPFV to 60. Subsection 29.85(a)(5) also requires the commercial boat registration number of the CPFV to be affixed to each trap and trap buoy deployed by that vessel. Traps not operated from CPFVs must be marked with buoys with the operator's GO ID number.

There is currently no limit to how many traps an individual may deploy, no required service interval (how often traps must be raised, cleaned and emptied), and no other buoy or trap marking requirements for recreational crab fishing.

PROPOSED REGULATIONS

The proposed regulations would establish restrictions to minimize entanglement risk as well as allow the state to collect data that would inform management of the crab fishery. The proposed regulations focus primarily on those recreational crab fishers who use and deploy traps to take crab. The proposal includes the following provisions:

- **Enhanced Gear Marking:** The proposed regulation would require all recreational crab traps be marked with a main buoy that is at least 5 inches in diameter and 11 inches in length and that a red marker buoy that is 3 inches in diameter and 5 inches in length be attached no more than three feet from the main buoy in order to help identify gear as originating from the recreational crab fishery should it entangle marine life. (Proposed subsection 29.80(c)(3))

- **Service Interval:** The proposed regulation would establish a maximum trap service interval of 9 days, which would help reduce lost and abandoned traps, and prevent fishers from storing gear at sea when not actively fishing and would prohibit abandoned traps. (Proposed subsection 29.80(c)(5))

- **Trap Limit:** The proposed regulation would establish an individual trap limit of 10 traps per operator which would reduce risk of entanglement by limiting the total number of vertical lines, and help determine a baseline effort for the recreational crab fishery. (Proposed subsection 29.80(c)(6))

- **Director Authority:** The Commission currently has exclusive management authority over the recreational crab fishery. Proposed subsection 29.80(c)(7) would provide authority for the Director of the Department, in consultation with the President of the Commission, to delay the fishery opener or close the season early in ocean waters of the state when the concentrations of Humpback whales, Blue whales, or Pacific Leatherback sea turtles exceed thresholds established in the Risk Assessment and Mitigation Program (Section 132.8). Proposed subsection 29.80(c)(7) states that before implementing a delay or closure, the recreational crab trap fishery will be given at least 5-days' notice through a Director's declaration on the Department's "Whale Safe Fisheries" webpage (https://wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries).

- **Trap Validation Program:** The proposed “Recreational Crab Trap Validation” program would require those individuals who fish for crabs with recreational crab traps to purchase an annual validation. The purpose of the proposed Recreational Crab Trap Validation would be to identify sport fishers that use crab traps so that the Department could conduct outreach on entanglement minimization efforts and collect essential fishery information. A small fee of $2.25 would be required for each validation (proposed subsections 29.85(b) and 701(h)).

The proposed regulatory package also includes clarifying, organizational and non-substantive edits to sections 29.80, 29.85, and 701.

Amend Subsection 29.80(a)

Subsection 29.80(a) describes allowable methods of take for saltwater crustaceans. This subsection also makes it unlawful to disturb, move or damage any trap, or remove any saltwater crustacean from a trap that belongs to another person without written permission from the trap owner.

The current text specifically references the marking requirement under the current subsection (c)(3). Under the proposed regulations, the referenced text will be moved to (c)(3)(A)1., so an update to the language is necessary to maintain its original intent.

Amend Subsection 29.80(b)

Subsection 29.80(b) prescribes how hoop nets may be used to take saltwater crustaceans. The language limits the number of hoop nets a person may possess, and further prescribes the two configurations of hoop nets that can be used legally in California.

This proposal would remove the reference to subsections (b)(1)(A) and (b)(1)(B) within the main body of subsection (b). The reference is redundant since the referenced subsections immediately follow the paragraph in which the reference is listed. The same applies to the reference to subsections (b)(3)(A) and (b)(3)(B) within subsection (b)(3). The proposed revisions to this subsection would also remove the phrase “[t]hey shall be defined as” in subsection (b)(1). “They” in this context refers to hoop nets and is redundant since the first phrase of the subsection is “Hoop Net Defined.” A comma is removed after the word, “crab” to correct the punctuation.

The proposed amendments to this subsection are necessary for streamlining the regulation and improving clarity.

Amend Subsection 29.80(c)(3)

Subsection 29.80(c)(3) addresses crab trap specifications and means for deployment, including the requirement for a single buoy marked with the operator’s GO ID. However, recent entanglement events have demonstrated that this marking is inadequate for attribution of the entanglement to the recreational crab fisheries in the event of an entanglement.

Between 1982 and 2019, there have been 506 separate large whale entanglements along the U.S. West Coast which have been confirmed by the National Marine Fisheries Service (NMFS; Saez et al. 2020; NOAA Fisheries 2020; NOAA Fisheries 2019). Of those entanglements, the

gear type could not be identified in 44% of the cases. The California recreational crab fishery has been responsible for three known entanglements, and potentially more due to the difficulties of identifying recreational gear as outlined above. Uncertainty in verifying fishery gear types from entanglements significantly limits fishery managers' ability to implement any targeted management response. A standardized marker buoy on recreational crab traps would greatly enhance the ability to identify the fishing gear type in the event of an entanglement. (Figure 1).

Figure 1. Example of a main buoy attached to a marker buoy (left) and a commercial California Dungeness crab buoy tag (right). Since 2013, commercial California Dungeness crab traps have been marked with standardized buoy tags, which have proven useful for identifying fishing gear type in marine life entanglement cases.

Proposed revisions to subsection 29.80(c)(3) relocate the information on buoy identification and expand the buoy requirements for recreational crab traps. This regulatory proposal would add to the existing buoy requirement by requiring all traps to be marked with two buoys (main and marker buoys).

Proposed subsection 29.80(c)(3)(A) defines the "main buoy." The specific dimensions of the buoy are proposed to be at least 5 inches in diameter and 11 inches in length, to be known as the main buoy. This minimum buoy size is available at most locations where fishing supplies are purchased and are commonly sold with crab traps.

Proposed subsection 29.80(c)(3)(A)1.: The language from current subsection (c)(3) is revised and relocated to this paragraph to state that an individual's main buoy must be marked with the operator's GO ID.

Proposed subsection 29.80(c)(3)(A)2.: The requirement for CPFV trap buoys to be labeled with the commercial boat registration number is moved from subsection 29.85(a)(5) to proposed subsection 29.80(c)(3)(A)2. This is a consolidation of the current requirement for CPFVs for buoy marking, and is necessary for placing all the buoy marking requirements in the same Section 29.80.

Proposed subsection 29.80(c)(3)(B) defines “marker buoy.” The marker buoy is a red buoy attached no more than 3 feet from the main buoy with dimensions of 3 inches in diameter and 5 inches in length (Figure 2). .

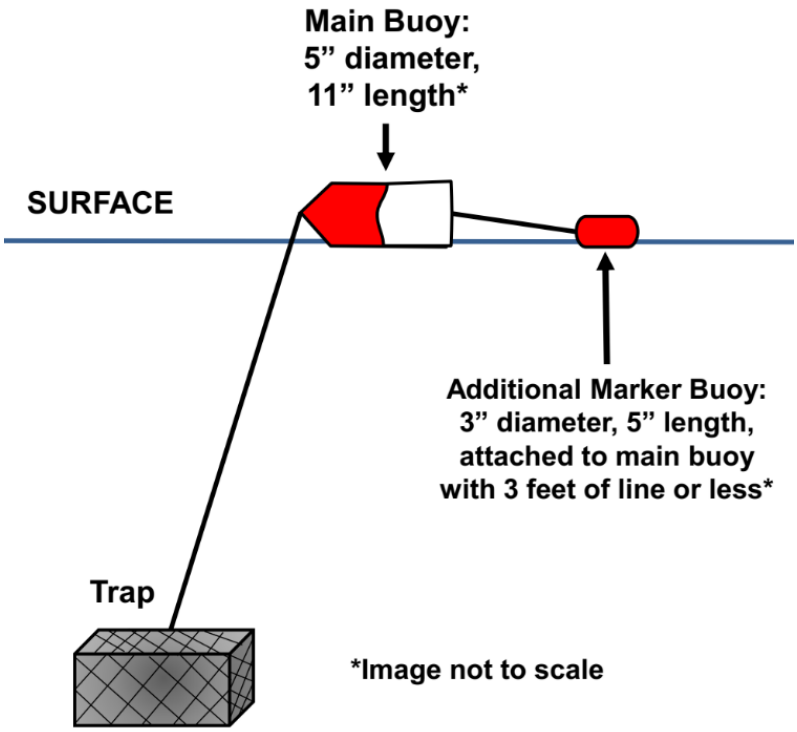

*Figure 2. Diagram of main buoy and additional marker buoy attached to crab trap as proposed in regulations (*image not to scale).*

This length of line will ensure that the main buoy and the marker buoy are likely to be viewed together in the event of an entanglement. Minimizing the length of line is also important to minimize risk of entanglement. These regulations would be consistent with end marker buoy regulations that the commercial fishery employs to designate the last traps located at the end of a row of deployed traps. The commercial buoys have similar dimensions although they can be any color and are required to be no more than 3 feet away from the main buoy or last trailer buoy as specified in subsections 132.6(a)(2) and (b).

Marker buoys are necessary to help identify recreational crab traps in the event of an entanglement. This buoy size and color were selected for marking recreational gear because such buoys are widely available at fishing supply stores.

Limiting the number of buoys to two is necessary to minimize risk of entanglement.

Proposed subsection 29.80(c)(3)(C): The requirement for CPFV traps themselves to be labeled with the commercial boat registration number is moved from subsection 29.85(a)(5). This is necessary to place all marking requirements in the same Section 29.80.

Figure 3. A main buoy marked with a marker buoy (top) versus a main buoy on its own. The addition of a marker buoy helps distinguish the buoy from a distance.

Add Subsection 29.80(c)(5)

Proposed subsection 29.80(c)(5) would add a 9-day maximum service interval to the recreational crab fishery and prohibit abandonment of traps in state waters. “Servicing” means raising the trap from the sea floor, cleaning the trap and related gear, and emptying out the trap. This 9-day service interval will help ensure regular tending and maintenance of recreational trap gear to reduce drifting or loss of the gear. Servicing of the trap can include removing fouling organisms, such as kelp, that may weigh down on the vertical line as well as re-baiting of traps, removing traps entirely from the ocean or redeploying traps to locations that better account for changing ocean conditions like large swells and storms. Lost and abandoned traps pose a long-term entanglement hazard for marine species, including ESA-protected species, long after the recreational crab fishing season ends. The 9-day period was chosen out of practical concerns for how the recreational fishery operates. Many participants

may only be able to check and retrieve traps during the weekends due to traditional weekday work schedules. A 9-day period thus covers two consecutive weekends, allowing crab trap operators at least two weekends to tend to their gear.

The proposed regulation mirrors Fish and Game Code (FGC) Section 9004, which establishes a maximum service interval for commercial trap fisheries. The statute has been in place for decades with firmly established enforcement practices. The servicing requirement is qualified by a weather exemption. The proposed regulatory text under subsection 29.80(c)(5) also exempts individuals from the service interval in the event of adverse weather to ensure individuals are not forced to choose between complying with a regulatory requirement and safety when ocean conditions are dangerous.

Add Subsection 29.80(c)(6) – Trap Limits

Proposed subsection 29.80(c)(6)(A) would add a 10-trap limit for each individual crab trap operator. The individual trap limit requirement is necessary to cap the number of deployed traps to a number a crab trap operator can responsibly deploy and still achieve a rewarding recreational experience. The individual trap limit requirement helps determine a baseline for recreational crab trap effort in the state. A trap limit also reduces the likelihood that a fisher will operate more traps than can be reasonably retrieved during a single fishing trip.

A trap limit may reduce the total number of deployed traps by individual fishers but will likely not reduce overall effort because of “trap sharing” within fisher groups. This proposed revision also makes it clear that an individual may service up to 10 traps from other operator(s), in addition to the 10 crab traps the individual is restricted to operate under the new crab trap limit. Any individual can currently service another person’s trap if that owner or operator provides a written note. This allows a fisher to operate additional traps in the event an owner is incapacitated. This proposed language is necessary to preserve the existing ability to share gear, as it is recognized that gear-sharing has become important for some fishers and may help reduce the overall number of traps deployed, in some circumstances. Discussions with constituent groups suggest that the option to share traps is important for certain segments of the recreational fishing community. However, allowing unlimited gear sharing would complicate law enforcement efforts, blur the responsibility of trap operators, and ultimately work to the detriment of the fishery, therefore servicing a maximum of another 10 crab traps is proposed.

While a 10-trap limit may not significantly reduce the total number of deployed traps, a trap limit in conjunction with a trap validation requirement (see below) can help determine the baseline effort level for this fishery, and prevent unlimited expansion of individual effort. The 10-trap limit was chosen based on extensive consultation with stakeholders, and is expected to accommodate fishing effort of most, if not all, recreational crab fishers. The lack of impact to existing fishing behavior is also supported by data from the California Recreational Fisheries Survey, which shows that between 2015 and 2019 the average number of traps used per boat-based fisher was less than two.

Proposed subsection 29.80(c)(6)(B) consolidates the new individual trap operator limit with the current trap limit for CPFVs, moving the existing maximum of 60 traps from subsection29.85(a)(4) to subsection 29.80(c)(6). The trap limit for CPFVs will remain at the current 60 traps per vessel, but the limit will apply to all crab traps instead of only applying to Dungeness crab traps. Moving the CPFV 60-trap limit to this subsection is necessary to place

all the trap limit requirements (in addition to the buoy marking requirements) in the same section for ease of reference for recreational crab fishery participants. This regulation change will maintain the current trap limit for CPFVs of 60 traps but will apply the trap limit for the take of all crab species, and not just Dungeness crab. Typically, CPFVs will target Dungeness crab while other crabs could be caught incidentally in traps. Establishing that this trap limit is for the take of all crab would prohibit additional traps from being deployed from CPFVs that target other crab, which, if allowed could increase the number of deployed traps and entanglement risks.

Add Subsection 29.80(c)(7)

Proposed subsection 29.80(c)(7) would provide authority to the Director of the Department, after consulting with the President of the Commission, to respond to potential marine life entanglement risk. This allows the Director to possibly delay the recreational crab fishing season, or close the season early based on entanglement risk to Humpback whales, Blue whales, and/or Pacific Leatherback sea turtles. The proposed regulation uses the numerical triggers in subsection 132.8(c)(2), which is part of the Risk Assessment Mitigation Program (RAMP) (OAL Notice #Z2020-0505-11) that requires the delay or closure of the commercial Dungeness crab fishery when certain criteria are met for ESA-protected marine species.

The underlying structure of the RAMP was developed by the California Dungeness Crab Fishing Gear Working Group (Working Group) through a multi-year iterative process. The Working Group was convened in 2015 to address the increased rate of marine life entanglements in California commercial Dungeness crab fishing gear and is comprised of commercial and recreational fishermen, environmental organization representatives, state and federal agencies, and subject matter experts. Additionally, the RAMP has undergone extensive public outreach through the regulatory development process.

The RAMP was originally developed by the Working Group to assess circumstances where entanglement risk by the commercial sector may be elevated and provide recommendations on appropriate management responses for the Department's Director to take action (CDFW, 2020). Section 132.8 will formalize that management framework into regulation, allowing the Director to take actions to reduce entanglement risk when such risk is elevated (e.g., high concentration of Humpback whales in fishing grounds at the start of the fishing season, or in the spring/summer months). The RAMP rulemaking process is currently underway and is expected to be completed prior to the adoption of this proposal for the recreational sector (CDFW, 2020).

Due to the dynamic nature of ocean processes and the risk of entanglements, it is proposed that the regulatory authority to restrict fishing be delegated to the Director. Thus under this proposal, starting at least 5 days in advance of the opening of the recreational Dungeness crab fishing season pursuant to Section 29.85, the Director would, on at least a monthly basis, evaluate and respond to risk of marine life entanglements and, after consulting with the President, implement a management action in the case of elevated risk consistent with acceptable data and numerical triggers outlined in subsection 132.8(c)(2). This delegation of authority is necessary to provide for real-time response to environmental conditions as urgent as a potential whale entanglement, which is not possible under the Commission's regulatory process and Bagley-Keene Open Meeting Act requirements. During periods of elevated

entanglement risk, entanglements could occur within days of triggering events and the Commission decision-making process cannot be implemented as quickly as that of the executive officer of an agency (i.e., the Department's Director). Furthermore, managing a seasonal delay or early closure for the recreational fishery separately from the commercial Dungeness crab fishery which is already subject to RAMP would add an extra layer of complexity that could further impede the management process; whereas consolidating this entanglement risk management for both fisheries under the authority of the Director would implement a timely and coordinated response. Thus, the proposed regulation outlines a separate but parallel process that allows the Director to take coordinated action.

After the initial risk evaluation at least 5 days in advance of the start of the recreational Dungeness crab fishing season, the Director shall undertake additional evaluations at least monthly until the season opens statewide and March 1 through June 15. Experience from implementing pilot forms of the RAMP in the commercial fishery has shown that this time frame adequately allows for additional information gathering and analysis by the Department to evaluate risk. Additionally, the monthly evaluations cycle mirrors the requirements in the commercial fishery RAMP, and the Department anticipates matching up (to the extent possible) the risk evaluation process for the recreational and commercial fisheries. After June 15, the Department expects potential entanglement risk to be low given anecdotal information on recreational fishing effort at this point in the summer.

Add Subsection 29.80(c)(7)(A)

Proposed subsection 29.80(c)(7)(A) specifies that the Director shall evaluate risk based on marine life concentrations as defined in RAMP subsection 132.8(a)(10), and consistent with the data and numerical triggers outlined in subsection 132.8(c)(2). The RAMP triggers for marine life concentrations are based on the historical migration patterns of protected Humpback whales, Blue whales, and Pacific Leatherback sea turtles. Triggers are defined primarily for two time periods when ESA-protected species are expected to leave waters off California during the fall (November 1 through the opening of the commercial Dungeness crab season) and arrive back to those same waters in spring (March 1 through the close of the commercial Dungeness crab season). "Data" as described in subsection 132.8(c)(2) include those current surveys and telemetry monitoring of those ESA-protected species that the Director shall consider to determine marine life concentrations as information for choosing an appropriate recreational management action in response to entanglement risk (as determined by the triggers). This provides the most reliable and up-to-date information on presence of species of concern, which can indicate the need to take a recreational management action.

Under proposed subsection 29.80(c)(7)(A)1., if data are available prior to the start of the season, and those data indicate the numerical triggers for marine life concentrations outlined in subsection 132.8(c)(2) are met, the Director shall implement one of the recreational management actions listed under subsection 29.80(c)(7)(B). Potential actions include an advisory to recreational fishers, a season delay or a season closure. Under subsection 29.80(c)(7)(A)2., if data are unavailable, the Director shall similarly implement a recreational management action until data become available. If specific triggers are reached, then the resulting management actions could delay the start of the season, close the season early, or both. Ensuring that the Director will implement a recreational management action(s) when the different scenarios under subsections 29.80(c)(7)(A)1. and 29.80(c)(7)(A)2. are met provides

clarity to recreational fishers on how the Director would respond in the event of elevated risk, communicating the Director's responsibility to address an entanglement risk. This subsection is necessary to provide a framework for risk evaluation by the Director, and to explain the framework within which the Director may implement management actions in response to an entanglement risk. It provides for consistency with the framework for Director management action in the commercial sector.

Add Subsection 29.80(c)(7)(B)

If the conditions in subsection 29.80(c)(7)(A) are met, the Director is required to pick from one or more of the three potential recreational management actions listed in subsection 29.80(c)(7)(B). After consulting with the President, the Director shall implement the recreational management action that the Director demonstrates protects Humpback whales, Blue whales, and Pacific Leatherback sea turtles based on best available science. Rationale for the recreational management action is provided in the Director declaration (further discussed below). The appropriate recreational management action shall be determined based on consideration of information outlined in subsection 132.8(d).

- Under proposed subsection 29.80(c)(7)(B)1.: an advisory to recreational fishers to employ voluntary efforts to reduce the risk of entanglements. In certain instances, for example depending on the depth of the whales or sea turtles, a delay or closure of the recreational fishery is not necessary to address the entanglement risk. However, even under those circumstances, an advisory is necessary to remind fishers of important measures to reduce entanglement risk and avoid further management response.
- Under proposed subsection 29.80(c)(7)(B)2.: a season delay, and continuation of the crab trap prohibition in subsection 29.80(c)(4), whereby the Director shall prohibit the deployment and use of recreational crab traps until new data indicate the measures are no longer necessary. A season delay is appropriate in circumstances when before the opening of the recreational Dungeness crab season, marine life concentrations indicate that putting traps in the water would cause overlap between fishing activity and location of whales or sea turtles, which causes entanglement risk.
- Under proposed subsection 29.80(c)(7)(B)3.: a season closure, whereby the Director shall prohibit the deployment and use of recreational crab traps until new data indicate the measures are no longer necessary or the end of the normal recreational Dungeness crab season. A season closure would be implemented after the opening of the season when marine life concentrations indicate removing traps is necessary to address an entanglement risk.

This subsection is necessary to make clear to recreational crab fishery participants what recreational management action(s) the Director may implement given the triggers for marine life concentrations under the risk assessment framework of RAMP referenced in Section 132.8. Additionally, it provides clarity on the duration of a recreational management action (i.e. until new data indicate the triggers are no longer met).

Add subsection 29.80(c)(7)(C)

The marine life concentration trigger under RAMP is determined by the number of Humpback whales, Blue whales, or Pacific Leatherback sea turtles that occur in one of seven delineated fishing zones (Figure 4), one of which applies exclusively to the Pacific leatherback sea turtle

(Zone 7). Proposed subsection 29.80(c)(7)(C) describes the geographic scale in crab fishing grounds at which a recreational management action may be implemented by the Director, either statewide or by fishing zone as defined in subsections 132.8(a)(7)(A)-(G). The zones are designed around the likely geographic resolution of available data, and behavioral dynamics of both fishing activities and protected species.

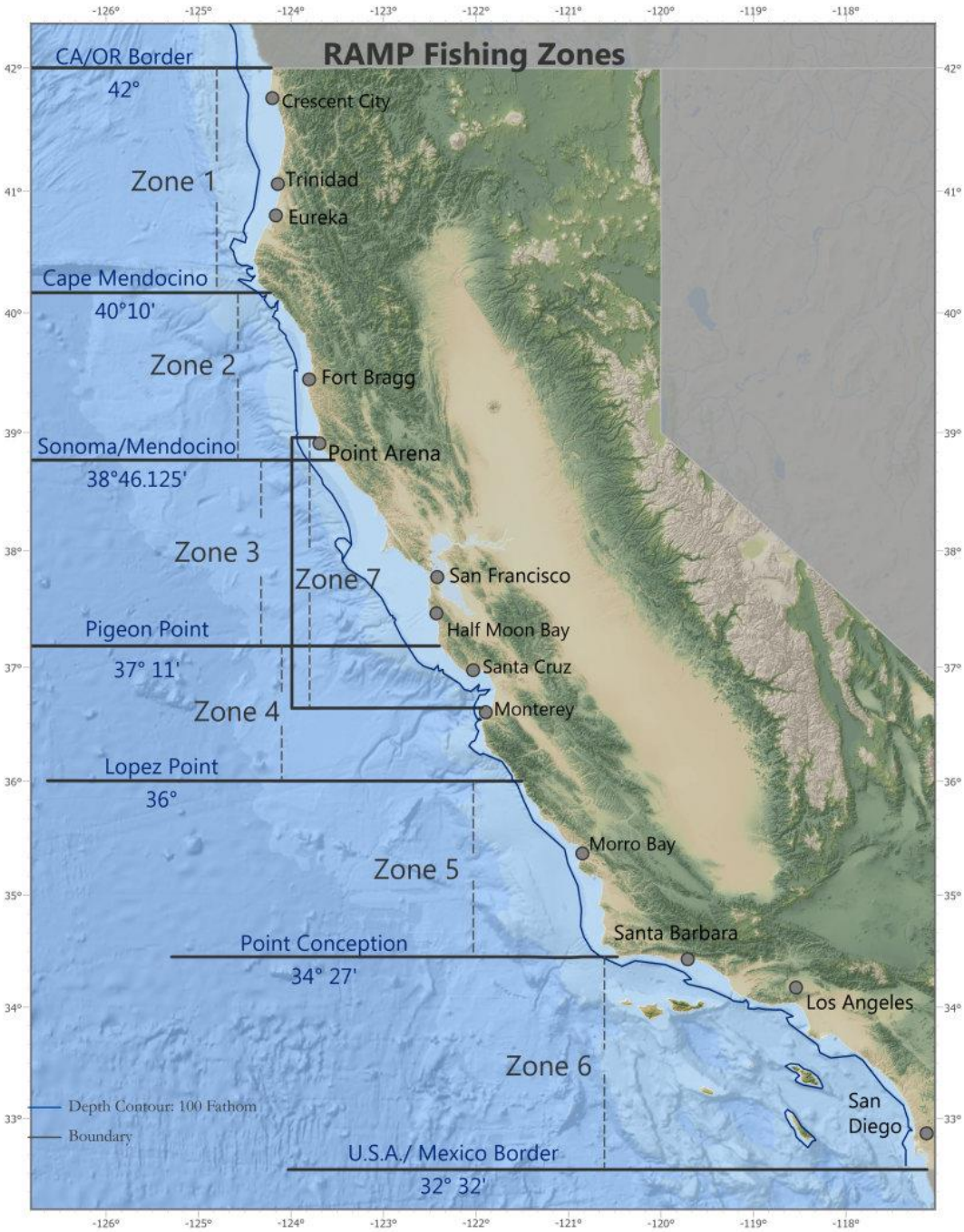

Figure 4. Proposed RAMP Fishing Zones.

If the Director demonstrates less-than-statewide action protects Humpback whales, Blue whales, and Pacific Leatherback sea turtles based on best available science, the Director may implement a recreational management action by fishing zone(s). For example, survey data may indicate that whale presence is concentrated in the fishing zone encompassing Monterey

Bay, but no whales were surveyed in the northern coast. In that instance, a fishing zone closure would appropriately address the entanglement risk while leaving recreational fishing opportunities available in other areas of the state where data indicate there is not an entanglement risk.

This subsection is necessary to make clear to recreational crab fishery participants what geographic scale a recreational management action may encompass.

Add Subsection 29.80(c)(7)(D)

Proposed subsection 29.80(c)(7)(D) requires the Director to provide notice of a recreational management action to the recreational fishery participants through a Director's declaration. Similar to the declaration prescribed in subsection 132.8(f)(1) for the commercial fishery, the recreational declaration will provide the information relied upon for recreational management action and supporting rationale for the Director's determination of risk and accompanying recreational management action, as well as anticipated duration of the recreational management action. If timing allows, the Department anticipates the recreational declaration will be paired with the commercial declaration for efficiencies in internal processing.

This subsection is necessary to specify how the Director and the Department will clearly articulate the basis and rationale for any decision on recreational management actions. This will ensure transparency to interested stakeholders and provide a record of decision-making.

Add Subsection 29.80(c)(7)(E)

Proposed subsection 29.80(c)(8) will require any declaration made by the Director pursuant to subsection 29.80(c)(7)(D) to include a minimum of 5-days' notice before any closure or delay takes effect. This notice is necessary to establish a reasonable time period for recreational fishery participants to receive the notice and make preparations to implement any required modification to their fishing practices.

Add Subsection 29.80(c)(7)(F)

Proposed subsection 29.80(c)(9) will require all advisory notices and declarations made by the Director pursuant to subsection 29.80(c)(7)(D) to be posted on the Department's "Whale Safe Fisheries" webpage, located at https://wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries. This subsection is necessary to inform recreational fishers of where to find the most up-to-date information on any recreational management actions. Posting to the webpage is the most efficient way to quickly provide notification of any advisory notice, Director's declaration or other recreational management action made by the Department. However, at its discretion, the Department may also provide notification through other means.

Add Subsection 29.80(c)(7)(G)

Proposed subsection 29.80(c)(10) will require the Director to notify the Commission of any actions taken and request the Commission schedule a public discussion of any such action at the next regularly-scheduled Commission meeting.

Amend Subsection 29.80(e)

The revision to subsection 29.80(e) removes the reference to 29.85 regarding take of crabs from commercial passenger fishing vessels, as that language was moved to subsection 29.80(c)(3) for consolidation purposes.

Amend Subsection 29.85(a)(1)

The term “Closure” is proposed to be removed from subsection 29.85(a)(1). As explained above for subsection 29.80(c)(7)(B), this rulemaking would add a new type of closure/season delay for the recreational crab fishery. It is necessary to remove the term “Closure” under in subsection 29.85(a)(1) to avoid confusion with a closure pursuant to proposed subsection 29.80(c)(7)(B). The removal will not lead to any substantive change to the regulation.

Add New Subsection 29.85(a)

Proposed subsection 29.85(a) would require anyone who takes crab recreationally using crab traps to possess a valid Recreational Crab Trap Validation. The validation is an add-on to a recreational fishing license, and will alert Department staff that the individual intends to participate in the recreational crab fishery using crab traps. The proposed trap validation would be valid for current license year and will only be needed for those that take crab recreationally using crab traps pursuant to subsection 29.80(c).

Department staff will be able to target validation holders with surveys to obtain essential fisheries data, and potentially share information to help minimize entanglement risk (i.e., the Director’s declarations or fishery advisories pursuant to subsection 29.80(c)(7)).

Information on recreational crab fishery effort, such as where and how many traps are deployed, can help the Department evaluate whether there is substantial overlap between fishing areas and key forage habitats of the protected species. Moreover, the validation along with the trap limit will allow Department staff to acquire essential fishery information, such as the number of participants, maximum trap effort and the level of take each year, which has not been formally accounted for in this fishery. Acquiring such information will allow the state to better monitor the direct and incidental impacts the fishery has on the natural environment through the use of traps in the recreational fishery, as well as its value to California’s coastal economy, ultimately resulting in management more consistent with the state’s marine life management goals.

Repeal Subsection 29.85(a)(4)-(5)

Trap limit and marking requirements for the recreational crab fishery would be consolidated under subsection 29.80(c)(6). Subsections 29.85(a)(4) and (a)(5), which prescribe such trap limits and marking requirements for CPFVs, would also be moved to Section 29.80 accordingly. Moving these two subsections is necessary to consolidate and streamline the regulation so recreational crab fishers can refer to such requirements in a single section.

Renumber Subsections 29.85(a)-(e)

Current subsections 29.85(a), (b), (c), (d), and (e) will be renumbered to accommodate new subsection 29.85(a).

Amend Subsections 29.85(b)(2) and (c)(1)

Renumbered subsections 29.85(b)(2) and (c)(1) would be amended to add a reference to the Director's authority to delay or close the recreational crab trap season. These additions are necessary to ensure recreational crab fishers are aware of the potential closures.

Amend Section 701

A nominal fee will be assessed for the Recreational Crab Trap Validation to cover its administrative cost. The fee will be added as subsection 701(h), and the original subsection (h) will be renumbered as subsection (i). The fee is proposed to be $2.25. See the Addendum to the STD. 399 for the fee determination calculation. This fee amount may be adjusted in the future as the Department develops a better understanding of the number of participants of the recreational crab fishery and is subject to annual adjustments pursuant to Section 699, Title 14, CCR.

Changes Without Regulatory Effect

Reference citations are being updated to better reflect the statutes being implemented, interpreted, and made specific. Section 110 of the Fish and Game Code (FGC) is being removed from the list of reference sections for sections 29.80, 29.85 and 701. Prior to January 1, 2007, Section 206 FGC outlined the Commission process for the adoption of sport fishing regulations. In 2006, Senate Bill (SB) 1535 repealed Section 206 and added a new Section 206 which outlined the Commission's general meeting schedule. In 2016 legislation (SB 1473), the then-current Section 206 FGC was amended and renumbered as Section 110 FGC. When updates to the authority and reference citations were made in rulemaking file 2017-0818-05S, staff inadvertently changed Section 206 FGC to Section 110 FGC. Section 1055 FGC is being replaced with Section 1055.1 FGC in the reference sections for Section 701 due to the repeal of Section 1055 FGC and addition of Section 1055.1 in 2015 legislation (SB 798).

(b) Goals and Benefits of the Regulation

It is the policy of this state to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat.

The proposed regulation would help reduce the entanglement risk posed by recreational crab traps towards marine animals protected by the federal Endangered Species Act and Marine Mammal Protection Act. The proposed regulations would also help the state obtain valuable information on recreational crab fishery participants. The information acquired would help the state better mitigate entanglement risk as well as better manage the crab fisheries overall to meet the state's various policy goals.

(c) Authority and Reference Sections from Fish and Game Code for Regulation

Authority: Sections 200, 205, 265, 270, 275, 713, 1050, 1053.1, 7075, 7078 and 7149.8, Fish and Game Code

Reference: Sections 200, 205, 265, 270, 275, 713, 1050, 1053.1, 1055.1, 7050, 7055, 7056 and 7149.8, Fish and Game Code

(d) Specific Technology or Equipment Required by Regulatory Change

Under subsection 29.80(c), new buoy requirements include the designation of the existing buoy requirement to be the "main buoy," and add specific minimum dimensions (5 inches diameter, 11 inches in length). The addition of the "marker buoy" to all recreational crab main buoys is intended to be the distinguishing characteristic of the fishery.

(e) Identification of Reports or Documents Supporting Regulation Change

California Department of Fish and Wildlife. 2019. Dungeness Crab, *Metacarcinus magister*, Enhanced Status Report. Available from https://marinespecies.wildlife.ca.gov/dungeness-crab/

California Department of Fish and Wildlife. 2020. Initial Statement of Reasons for Regulatory Action to Add Section 132.8, Title 14, California Code of Regulations, Re Risk Assessment Mitigation Program: Commercial Dungeness Crab Fishery. Available from https://wildlife.ca.gov/Notices/Regulations/RAMP

Documents Supporting RAMP regulation change:

- Senate Bill 1309, 2018, McGuire: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1309
- Benson, S.R., K.A. Forney, J.T. Harvey, J.V. Carretta, and P.H. Dutton (2007). Abundance, distribution, and habitat of leatherback turtles (Dermochelys coriacea) off California, 1990-2003. Fishery Bulletin, 105(3): 337–347.
- Calambokidis, J., G.H. Steiger, C. Curtice, J. Harrison, M.C. Ferguson, E. Becker, M. DeAngelis, and S.M. Van Parijs. 2015. Biologically Important Areas for Selected Cetaceans Within U.S. Waters – West Coast Region. *Aquatic Mammals,* 41(1): 39-53. DOI 10.1578/AM.41.1.2015.39
- Carretta, J. V., K.A. Forney, E.M. Oleson, D.W. Weller, A.R. Lang, J. Baker, M.M. Muto, B. Hanson, A.J. Orr, H. Huber, M.S. Lowry, J. Barlow, J.E. Moore, D. Lynch, L. Carswell, and R.L. Brownell Jr. 2019. Humpback Whale (*Megaptera novaengliae*): California/ Oregon/ Washington Stock (pp. 173-182), and Blue Whale (*Balaenoptera musculus musculus*): Eastern North Pacific Stock (pp. 183-190), *In* Assessment U.S. Pacific Marine Mammal Stock Assessments: 2018. U.S. Department of Commerce, NOAA Technical Memorandum NMFSSWFSC-617.
- California Dungeness Crab Fishing Gear Working Group, Guidelines for Research and Development Projects, Focus on Ropeless Gear Innovations, Feb 2019: http://www.opc.ca.gov/webmaster/_media_library/2019/02/Whales-Gear-Innovations-R-and-D-Guidelines-February-2019.pdf
- California Dungeness Crab Fishing Gear Working Group, Recommendations Memo, November 12, 2019: http://www.opc.ca.gov/webmaster/_media_library/2019/11/CAWhaleWorkingGroup_HighlightsRecommendationsMemo_SeptOct2019_FINAL.pdf

- California Dungeness Crab Fishing Gear Working Group, Recommendations Memo, October 15, 2018: http://www.opc.ca.gov/webmaster/_media_library/2018/10/Whales_WorkingGroupRecommendationsMemo_October2018_FINAL.pdf
- California Dungeness Crab Fishing Gear Working Group, Call Summary, September 26, 2019: http://www.opc.ca.gov/webmaster/_media_library/2019/10/CAWorkingGroup_WebinarSummary_Sept262019.pdf
- California Dungeness Crab Fishing Gear Working Group, Summary of Key Themes, September 4-5, 2019: http://www.opc.ca.gov/webmaster/_media_library/2019/10/CAWorkingGroup_KeyThemesSummary_FINAL_Sept4-52019.pdf
- California Dungeness Crab Fishing Gear Working Group, Summary of Key Themes, March 26, 2019: http://www.opc.ca.gov/webmaster/_media_library/2019/04/CAWhaleWorkingGroup_KeyThemesSummary_26March2019Meeting_FINAL.pdf
- California Dungeness Crab Fishing Gear Working Group Risk Assessment and Recommendation https://www.wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries
- California Ocean Protection Council, Strategic Plan to Protect California's Coast and Ocean 2020-2025 http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20200226/OPC2020-2025-
- Strategic-Plan-FINAL-20200228.pdf NMFS, 2020. West Coast Region Protected Resources Division, Draft Serious Injury Mortality Report, July 13, 2020. Available from: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=180688
- NMFS, 2012a. NMFS Policy Directive (PD-02-038), Process for Distinguishing Serious from Non-Serious Injury of Marine Mammals, effective January 27, 2012, available from: https://www.avma.org/sites/default/files/resources/noaa_serious_injury_policy.pdf
- NMFS, 2012b. NMFS Instruction (02-038-01), Process for Distinguishing Serious from Non-Serious Injury of Marine Mammals: Process for Injury Determinations, effective January 27, 2012, available from: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-policies-guidance-and-regulations
- Saez, L., D. Lawson, and M. DeAngelis. 2020. Large whale entanglements off the U.S. West Coast, from 1982-2017. NOAA Tech. Memo. NMFS-OPR-63, 48 p. Available from https://www.fisheries.noaa.gov/resource/document/large-whale-entanglements-us-west-coast-1982-2017
- 64 Federal Register 102, May 27,1999. North Pacific Fishery Management Council; Public Meetings, pages 28800-28802. Available from: https://www.govinfo.gov/content/pkg/FR-1999-05-27/pdf/FR-1999-05-27.pdf
- 77 Federal Register 4169, January 26, 2012. NOAA Endangered and Threatened Species: Final rule to revise the critical habitat designation for the endangered

Leatherback Sea Turtle, pages 4170-4201. Available from https://www.govinfo.gov/content/pkg/FR-2012-01-26/pdf/2012-995.pdf

NOAA Fisheries. 2020. 2019 West Coast Whale Entanglement Summary. Available from https://www.fisheries.noaa.gov/resource/document/2019-west-coast-whale-entanglement-summary-and-infographic

NOAA Fisheries. 2019. 2018 West Coast Whale Entanglement Summary. Available from https://www.fisheries.noaa.gov/resource/document/2018-west-coast-whale-entanglement-summary

(f) Identification of Reports or Documents Providing Background Information:

Santora, J. A., Mantua, N. J., Schroeder, I. D., *et al*. (2020). Habitat compression and ecosystem shifts as potential links between marine heatwave and record whale entanglements. *Nature communications*, 11(1), 1-12. Available from https://www.nature.com/articles/s41467-019-14215-w

(g) Public Discussions of Proposed Regulations Prior to Notice Publication

- November 5, 2019: Commission Marine Resources Committee meeting in Sacramento.
- December 3, 2019: Public webinar to discuss proposed regulations.
- December 12, 2019: Fish and Game Commission meeting in Sacramento.
- January 6, 2020: Workshop with representatives of the recreational sector in Sacramento.
- January 11, 2020: Workshop with representatives of the recreational sector in Sausalito.
- January 23, 2020: Workshop with representatives of the recreational sector in Eureka.
- March 17, 2020: Commission Marine Resources Committee webinar.
- March 19, 2020: CA Dungeness Crab Fishing Gear Working Group teleconference.
- April 16, 2020: Fish and Game Commission teleconference.
- June 24, 2020: Fish and Game Commission webinar/teleconference.

On May 11, 2020, the Department provided formal notice to California tribal governments regarding the development of the proposed regulations and requested preliminary input by June 15, 2020. As of the date on this Initial Statement of Reasons, no requests for government-to-government consultation have been received. Four tribal governments did contact the Department: Santa Ynez Band of Chumash Indians, Yocha Dehe Wintun Nation, Manchester Band of Pomo Indians, and Federated Indians of Graton Rancheria. Three tribal governments had questions about the intent or background of the rulemaking proposals which the Department was able to provide. A fourth tribal government voiced its support for measures to protect marine animals.

IV. Description of Reasonable Alternatives to Regulatory Action

(a) Alternatives to Regulation Change

Alternative 1:
Adoption of a trap limit that would appreciably reduce the number of recreational crab traps deployed in the ocean. Initial discussions included a range from three to ten traps. Based on stakeholder feedback, a more stringent trap reduction would constrain an fishers' ability to share gear with family and friends during fishing trips. Allowing individuals to share gear with other fishers may also help to limit the total number of traps fished by area. As a result, a lower trap limit was rejected. The issue of gear sharing may be addressed in a future rulemaking.

Alternative 2:
Requiring that *all* crab fishers, not just those fishing with crab traps, obtain the validation. There are many unknowns about the number of individuals fishing with the various methods and the validation would provide an opportunity for information gathering. However, the purpose of the regulation is to gather information to inform ways of minimizing whale entanglement risk, and crab fishers using methods other than crab traps deployed from boats have no known contribution to that risk. Therefore, this alternative was rejected.

Alternative 3:
A Recreational Crab Trap Validation "sunset" date. The intent of the validation is to gather information to inform the Department on recreational crab trap fishing effort and to document the crab trap fishery participants for the purpose of communication of Director's declarations, advisories to recreational fishers, etc. Due to the likelihood of ongoing entanglement risk as well as the need to obtain ongoing information for the orderly management of the fishery, continued data collection is essential for maintaining consistent seasonal communication with fishery participants. As a result, a sunset provision was rejected. If the validation ever outlives its purpose, it can be eliminated in a future rulemaking.

Alternative 4:
A recreational gear retrieval program which would remove lost and/or abandoned recreational crab trap gear. The commercial gear retrieval program started for the first time on May 22, 2020. Before layering on an additional program, the Department wants to implement and evaluate the current program to determine if there are any changes that need to be made. Additionally, the Department has not conducted outreach on this alternative, and it was not included in the initial proposals that have been discussed with the recreational fishery participants dating back to July of 2019. The buoy marking aspect in this rulemaking needs to be implemented so that gear can clearly be identified before a retrieval program is established. Lastly, prior to implementing this type of program, considerations of Commission authority need to be further explored to ensure a retrieval program can be appropriately implemented. For these reasons, this alternative was rejected.

Alternative 5:
Inclusion of specific regulatory language banning the use of plastic liquid containers such as used milk jugs or detergent bottles as main buoys. These items are not intended to serve as buoys, nor built for the harsh conditions of the marine environment and may easily contribute

to gear loss. However, the difficulty of developing adequate regulatory language led to the rejection of this alternative at this time.

Alternative 6:
Marking recreational traps with tags or lettering. These methods are already being used to mark commercial gear. Department staff were concerned that using either tags or lettering would lead to the traps being conflated with commercial gear in the event of an entanglement and this alternative was rejected.

Alternative 7:
The development of an independent recreational counterpart to RAMP. This alternative was rejected due to the lack of an identifiable trigger unique to the recreational fishery. The recreational and commercial fisheries operate using similar, if not identical gear, and over the same fishing grounds at roughly the same time of year. As such, the Department is recommending use of the established RAMP program to inform a management action in the recreational fishery using only the Marine Life Concentrations trigger in the RAMP.

(b) No Change Alternative

Without change, the recreational crab fishery will maintain the same level of entanglement risk for ESA-protected species, and the Department and Commission will continue to lack baseline information regarding the fishery that could inform a management action to address risk. When entanglement risk is elevated, the quickest regulatory response would be through emergency regulations, providing stakeholders with a shortened opportunity for input. While the emergency rulemaking process is faster than a regular rulemaking, it still would not be responsive enough to address the immediate threat of entanglement when large whales and sea turtles are actively migrating along the coast.

(c) Description of Reasonable Alternatives that Would Lessen Adverse Impact on Small Business

No reasonable alternatives that would lessen adverse impacts on small businesses were identified by or brought to the attention of Department or Commission staff.

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 proposed regulations are for a recreational marine fishery and are not

anticipated to change the level of fishing activity. CPFVs that take fishers on crab fishing trips would be required to attach additional buoys to crab trap lines at a cost of $4.00 per buoy for up to the maximum 60 traps per vessel, resulting in industry costs of $15,360 in initial costs and approximately $7,680 in subsequent years to replace lost or damaged buoys. The additional costs for CPFVs to purchase marker buoys is not anticipated to be significant because these costs are a very small share of CPFV operating costs and would not change procedure. As a result of fishing season closures or delays, CPFV operations could be impacted depending on the percentage of their group fishing trips that are solely or predominantly for crab trapping. Vessels that pursue multiple species cold more readily shift effort away from trap-taken crabs should crab season delays or closures occur. These impacts are not anticipated to be more than those due to the typical season variation due to weather and other unknown influences.

(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 regulations are not anticipated to affect the volume of recreational crab trapping activity nor result in significant costs to CPFVs that serve recreational crab trappers.

The Commission does not anticipate any benefits to the health and welfare of California residents or to worker safety.

The Commission anticipates benefits to the state's environment by reducing the potential for marine life entanglement in recreational fishing gear.

(c) Cost Impacts on a Representative Private Person or Business

Recreational crab fishers would be required to purchase a $2.25 Recreational Crab Trap Validation annually to participate in any crab trap fishery. Fishers may also incur costs for up to ten buoys at approximately $4.00 each if they elect to fish the maximum number of traps. The proposed changes are not expected to change the level of fishing activity. CPFVs that take individual fishers on crab fishing trips would be required to attach additional buoys to crab trap lines at a cost of $4.00 per buoy for up to the maximum 60 traps, summing to $240 in initial costs and approximately $120 in subsequent years to replace lost or damaged buoys.

The proposed regulation also includes the provision of authority for the Director of the Department to take action to reduce the risk of marine life entanglement. This component of the regulation is not anticipated to have cost impacts to individuals. However, CPFV operations could be impacted depending on the percentage of their group fishing trips that are solely or predominantly for crab trapping. Vessels that pursue multiple species could more readily shift effort away from trap-taken crabs should crab season delays or closures occur.

(d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State

The proposed regulations are anticipated to introduce some start-up and ongoing implementation and enforcement costs that will be re-covered with the proposed Recreational Crab Trap validation program. An estimated additional $13,500 in validation revenue is anticipated to be collected by the Department. The Commission does not anticipate any savings to State agencies or costs/savings in federal funding to the State.

(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 principal intent of the proposed regulation is to minimize entanglement risks as well as to improve marine resource management through the collection of key fishery activity information. Department recreational fishing survey data indicate that at least 6,000 individuals engage in recreational crab trap fishing and would be affected by changes in requirements regarding: enhanced gear marking; service intervals; trap limits; Director authority to restrict take; and a new validation program. CPFV operators provide recreational fishing trips for dozens of ocean species, and those who provide crab trapping (average of 64 vessels per 2010-2019 CPFV log data), would also be directly affected by the proposed regulations. CPFVs operating in California are characterized as small businesses (per CA Government Code Article 2, Section 11342.610) as all are independently owned and operated and not dominant in its field of operation.

(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 regulations are for a recreational marine fishery and are not anticipated to change the level of fishing activity. The additional costs for CPFVs to purchase marker buoys is not anticipated to result in the creation or elimination of jobs because these costs are a very small share of CPFV operating costs and would not change procedures so as to require more or less labor. As a result of fishing season closures or delays, CPFV operations could be impacted depending on the percentage of their group fishing trips that are solely or predominantly for crab trapping. Vessels that pursue multiple species could more readily shift effort away from trap-taken crabs should crab season delays or closures occur. Impacts to the creation or elimination of jobs are not anticipated because the number of CPFV

trips are not anticipated to change more than the typical seasonal variation due to weather and other unknown influences.

(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 any new businesses, or elimination of existing businesses, because the proposed regulation is not likely to substantially increase or decrease recreational fishing activity within the state. The additional costs for CPFVs to purchase marker buoys is not anticipated to result in the creation or elimination of businesses because costs are a very small share of CPFV operating costs and the supply of buoys is already sufficient to fulfill this requirement. As a result of fishing season closures or delays, CPFV operations could be impacted depending on the percentage of their group fishing trips that are solely or predominantly for crab trapping. Vessels that pursue multiple species could more readily shift effort away from trap-taken crabs should crab season delays or closures occur. However, this is not anticipated to result in the creation or elimination of businesses because the number of CPFV trips are not anticipated to change more than the typical seasonal variation due to weather and other unknown influences.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State

The Commission does not anticipate any effects on the expansion of businesses currently doing business in the State because the proposed regulation is not likely to substantially increase or decrease recreational fishing activity within the State.

The additional costs for CPFVs to purchase marker buoys is not anticipated to result in the expansion of businesses because costs are a very small share of CPFV operating costs, and the supply of buoys is already sufficient to fulfill this requirement. As a result of fishing season closures or delays, CPFV operations could be impacted depending on the percentage of their group fishing trips that are solely or predominantly for crab trapping. Vessels that pursue multiple species could more readily shift effort away from trap-taken crabs should crab season delays or closures occur. However, this is not anticipated to result in the expansion of businesses because the number of CPFV trips are not anticipated to change more than the typical seasonal variation due to weather and other unknown influences.

(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 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 regulation is anticipated to benefit the State’s environment by reducing the potential for entanglements of ESA-protected marine life species in fishing gear.

Current regulations for the recreational take of rock crab and Dungeness crab specify seasons, size limits, bag and possession limits, closed fishing areas, and gear restrictions. Like most recreational fisheries, a recreational fishing license is the only license required to participate in recreational crab fishing. In addition to traps, crabs can also be taken recreationally by hand, crab loop traps (snares), or hoop nets. Individuals are generally not allowed to operate a trap owned by another person unless they have in possession written permission from the owner.

Individual fishermen may fish using their own gear, or may join a scheduled fishing trip on a Commercial Passenger Fishing Vessel (CPFV). CPFVs take customers on fishing trips and provide fishing gear for use by their clients or passengers. Current regulations limit the number of crab traps used to take Dungeness crab by a CPFV to 60 and specify that the commercial boat registration number of the CPFV must be affixed to each trap and trap buoy deployed by that vessel. Current regulations specify that traps not operated from CPFVs must be marked with buoys with the operator's GO ID number.

There is currently no limit to how many traps an individual may deploy, no required service interval (how often traps must be raised, cleaned and emptied), and no other buoy or trap marking requirements for recreational crab fishing.

The Fish and Game Commission (Commission) and the Department of Fish and Wildlife (Department) are proposing to amend sections 29.80, 29.85, and 701, Title 14, California Code of Regulations (CCR). The proposed regulatory changes would be the first step in addressing entanglement risk posed by the recreational crab fishery in California towards species listed under the federal Endangered Species Act (ESA). Between 2014 and 2019, three Humpback whale entanglements were attributed to the recreational crab fishery in California. The proposal would also allow the Department to gather essential fishery information.

The fishing gear responsible for entanglement could not be identified in 44% of all confirmed entanglements between 1982 and 2017, and the recreational crab fishery may be responsible in some of these instances. This uncertainty, along with the scarcity of essential fishery information, makes development of mitigation measures very difficult.

The proposed regulations would establish some restrictions to minimize entanglement risks as well as allow the state to collect crucial information that would contribute to future management. The proposed regulations include the following provisions:

- **Enhanced Gear Marking**: Proposed subsection 29.80(c)(3), Title 14, CCR, would require all recreational crab traps be marked with a main buoy that is at least 5 inches in diameter and 11 inches in length and that a red marker buoy that is 3 inches in diameter and 5 inches in length be attached no more than three feet from the main buoy. Current regulation requiring buoy marking, and in the case of CPFV's, trap marking, would be consolidated in this subsection.
- **Service Interval**: Proposed subsection 29.80(c)(5), Title 14 ,CCR, would establish a maximum service interval of 9 days, weather conditions at sea permitting, and would prohibit abandoned traps.
- **Trap Limit**: Proposed subsection 29.80(c)(6), Title 14, CCR, would establish an individual trap limit of 10 traps. The current 60-trap limit for Commercial Passenger Fishing Vessels (CPFVs)

targeting Dungeness crab will be moved from subsection 29.85(a)(4) to this subsection and will apply to CPFVs targeting any crab. The proposed regulation would allow an individual to service up to 10 additional traps if they possess written permission from the operator(s) of the additional traps whose gear are identified in accordance with subsection 29.80(c)(3).

- **Director Authority**: Proposed subsection 29.80(c)(7), Title 14, CCR, would provide authority for the Director of the Department, after consulting with the President of the Commission, to delay the fishery opener or close the season early in ocean waters of the state when the concentrations of Humpback whales, Blue whales, or Pacific Leatherback sea turtles exceed thresholds established in the Risk Assessment and Mitigation Program (Section 132.8. Title 14, CCR). Starting at least 5 days in advance of the opening of the recreational Dungeness crab fishing season, the Director shall, on at least a monthly basis until the season opens statewide and March 1 through June 15, evaluate and respond to risk. Any delay or closure could apply statewide or by zone(s). The proposed regulation provides that before implementing a delay or closure, the recreational crab trap fishery will be given at least 5-days' notice through a Director's declaration on the Department's "Whale Safe Fisheries" webpage (https://wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries). In addition, the Director will notify the Commission of any actions taken and request the Commission schedule a public discussion of any such action at the next regularly-scheduled Commission meeting. References to this authority will be added to subsections 29.85(b)(2) and (c)(1).
- **Trap Validation Program**: Proposed subsections 29.85(b) and 701(h), Title 14, CCR, would establish a "Recreational Crab Trap Validation" program that would require those individuals who fish for crabs with recreational crab traps to purchase an annual validation. A small fee of $2.25 would be required for each validation.

The proposed regulatory package also includes clarifying, organizational and non-substantive edits to sections 29.80, 29.85, and 701, Title 14, CCR.

Benefits of the Regulations

The proposed regulation would help reduce marine life entanglement caused by the recreational crab fishery. It would also establish a framework by which the Commission and the Department can collect the requisite information to better manage the fishery to further reduce entanglement and to better meet the state's fishery management goals.

Consistency and Compatibility with Existing Regulations

Article IV, Section 20 of the State Constitution specifies that the Legislature may delegate to Commission such powers relating to the protection and propagation of fish and game as the Legislature sees fit. The Legislature has delegated authority to the Commission to promulgate sport fishing regulations (Fish and Game Code sections 200, 205, 315, and 316.5). Commission staff has searched the California Code of Regulations and has found no other state regulations that address the recreational take of crabs using trap gear. The Commission has reviewed its own regulations and finds that the proposed regulations are consistent with other recreational fishing regulations and marine protected area regulations in Title 14, CCR, and therefore finds that the proposed regulations are neither inconsistent nor incompatible with existing state regulations.

Proposed Regulatory Language

Section 29.80, Title 14 CCR, is amended to read:

§ 29.80. Gear Restrictions for Recreational Take of Saltwater Crustaceans

(a) General Provisions.

(1) Saltwater crustaceans may be taken by hand.

(2) Nets, traps or other appliances may not be used except as provided in this Section.

(3) It is unlawful to disturb, move, or damage any trap; or remove any saltwater crustacean from a trap, that belongs to another person without written permission including permission transmitted electronically, in possession from the operator of the trap. Any person with written permission from the operator of a crab trap will be in compliance with subsection (c)(3)(A)1. if the written permission contains the operator's GO ID number that matches the GO ID number on the buoy of the crab trap being fished.

(b) Hoop nets may be used to take spiny lobsters and all species of crabs. Between Point Arguello, Santa Barbara County, and the United States-Mexico border, not more than five hoop nets~~, as defined in (b)(1)(A) or (b)(1)(B),~~ shall be possessed by a person when taking spiny lobster or crab, not to exceed a total of 10 hoop nets possessed when taking spiny lobster or ~~crab,~~crab per vessel. The owner of the hoop net or person who placed the hoop net into the water shall raise the hoop net to the surface and inspect the contents of the hoop net at intervals not to exceed 2 hours.

(1) Hoop Net Defined: There are two types of hoop nets allowed for use:~~. They shall be defined as:~~

(A) Type A: Fishing gear that is comprised of one to three rigid ring(s), with each ring measuring no greater than 36 inches in inside diameter nor less than 10 inches in inside diameter, which is/are connected to soft mesh thereby forming a circular-shaped net with an enclosed bottom. Lift lines shall be attached only to the top ring. A second and third rigid ring(s) may be connected by soft mesh to the top ring; however, each ring must be equal in size to or smaller than the ring above it. When the net is being raised the top ring shall be above and parallel to all other rings, with the enclosed bottom portion of the soft mesh even with or hanging below all other rings. All parts of the hoop net shall collapse and lie flat when resting on the ocean floor in such a manner that the gear does not entrap or restrict the free movement of crustaceans until lifted. When suspended from lift lines, the entire hoop net shall measure no taller than 36 inches. The ring material shall not be thicker than one inch in any dimension.

(B) Type B: Fishing gear that is comprised of two to three rigid rings (not including the bait ring), with each ring measuring no greater than 36 inches in inside diameter and the top ring measuring no less than 15 inches in inside diameter. The upper ring or rings shall be connected to the bottom ring and supported by no more than six rigid support arms, and the assembled frame shall measure no more than 10 inches tall. The rings and support material shall not be thicker than one inch in any dimension. All rings shall be connected by soft mesh, thereby forming a net with an enclosed bottom, and lift lines shall be attached only to the top ring. When suspended from lift lines the enclosed bottom portion of the net shall be even with or hanging below all other rings, and the entire net shall measure no taller than 30 inches. A bait ring may be attached to the net as long as the ring is not part of the rigid frame.

(2) Any hoop net abandoned or left unchecked for more than 2 hours shall be considered abandoned and seized by any person authorized to enforce these regulations.

(3) Hoop nets used south of Point Arguello, Santa Barbara County, shall be marked with a surface buoy. Except as provided ~~in subsections (b)(3)(A) and (b)(3)(B)~~ below, the surface buoy shall be legibly marked to identify the operator's GO ID number as stated on the operator's sport fishing license. This section does not apply to hoop nets deployed by persons on shore or manmade structures connected to the shore.

(A) The surface buoy of hoop nets deployed from commercial passenger fishing vessels shall be legibly marked to identify the commercial boat registration number of the vessel.

(B) The surface buoy of hoop nets provided by a licensed guide to clients for use on guided trips shall be legibly marked to identify the guide license number of the accompanying guide.

(c) Crab traps:

(1) Crab traps shall have at least two rigid circular openings of not less than four and one-quarter inches inside diameter so constructed that the lowest portion of each opening is no lower than five inches from the top of the trap.

(2) Crab traps shall contain at least one destruct device of a single strand of untreated cotton twine size No. 120 or less that creates an unobstructed escape opening in the top or upper half of the trap of at least five inches in diameter when the destruct attachment material corrodes or fails.

(3) ~~Every crab trap except those used under authority of subsection 29.85(a)(5) of these regulations shall be marked with a buoy. Each buoy shall be legibly marked to identify the operator's GO ID number as stated on his/her sport fishing~~

~~license~~ Trap Gear Identification: Every crab trap shall be marked with only a main buoy and a marker buoy, except as noted under subsection 29.80(c)(3)(C) below.

(A) A main buoy is a surface buoy that is at least 5 inches in diameter and 11 inches in length.

1. The main buoy for traps deployed by an individual shall be legibly marked with the operator's assigned GO ID number.

2. The main buoy for traps deployed from a commercial passenger fishing vessel shall be legibly marked to identify the commercial boat registration number of that vessel.

(B) A marker buoy is a red buoy 3 inches in diameter and 5 inches in length attached no more than 3 feet from the Main Buoy.

(C) In addition to marking the buoy pursuant to subsection (c)(3)(A)2., traps deployed by commercial passenger fishing vessels shall be legibly marked to identify the commercial boat registration number of the vessel.

(4) Crab traps shall not be deployed and used in ocean waters seven days prior to the opening of the Dungeness crab season.

(5) Every crab trap shall be raised, cleaned, and emptied (serviced) at intervals not to exceed 9 days, weather conditions at sea permitting, and no crab trap shall be abandoned in the waters of this state.

(6) Trap Limits:

(A) An individual shall not operate more than 10 deployed traps, except an individual may service up to 10 additional traps if the individual has in possession written permission from the operator(s) of the additional traps whose gear are identified in accordance with subsection (c)(3)(A)1.

(B) A commercial passenger fishing vessel shall not deploy more than 60 traps per vessel.

(7) Starting at least 5 days in advance of the opening of the recreational Dungeness crab fishing season pursuant to Section 29.85, the director shall, on at least a monthly basis until the season opens statewide and March 1 through June 15, evaluate and respond to risk of humpback whales, blue whales, and/or Pacific leatherback sea turtle entanglement with recreational crab fishing gear as follows:

(A) The director shall evaluate entanglement risk based on marine life concentrations as defined in subsection 132.8(a)(10), Title 14, CCR, and consistent with the acceptable data and numerical triggers outlined in subsection 132.8(c)(2).

1. If data are available, and marine life concentrations meet the numerical triggers for any species as specified in subsection 132.8(c)(2)(A)4. (in the fall) or 132.8(c)(2)(B) (in the spring), the director shall take action pursuant to subsection 29.80(c)(7)(B) below.

2. If data are unavailable prior to the recreational Dungeness crab season opener, the director shall take action pursuant to subsection 29.80(c)(7)(B) below until data are available, at which point subsection 29.80(c)(7)(A)1. shall apply.

(B) If required under subsection 29.80(c)(7)(A) above, the director after consulting with the president of the commission or the president's designee, shall implement one or more of the following recreational management actions that the director demonstrates protects humpback whales, blue whales, and/or Pacific leatherback sea turtles based on best available science. Recreational management action shall be determined based on consideration of information outlined in subsection 132.8(d):

1. Advisory notice to recreational crab fishers to employ voluntary efforts and/or measures to reduce the risk of entanglements (e.g. best fishing practices).

2. Recreational Dungeness crab season delay and continuation of the crab trap prohibition specified in subsection 29.80(c)(4), whereby the director shall prohibit the deployment and use of recreational crab traps until new data indicates the numerical triggers for any species as specified in subsection 132.8(c)(2)(A)4. (in the fall) are no longer met, at which point the director shall lift or modify the Dungeness crab season delay as appropriate.

3. Season closure, whereby the director shall prohibit the deployment and use of recreational crab traps until new data indicates the numerical triggers for any species as specified in subsection 132.8(c)(2)(B) (in the spring) are no longer met, or the normal end of the Dungeness crab season specified in subsection 29.85(b)(2), at which point the director shall lift or modify the closure as appropriate.

(C) Recreational management action may be implemented statewide or by fishing zone(s) (as defined in subsections 132.8(a)(7)(A)-(G)), if the director demonstrates less-than-statewide action protects humpback whales, blue whales, and/or Pacific leatherback sea turtles based on best available science.

(D) Notice of a delay or closure pursuant to subsection 29.80(c)(7)(B)2. or 3. shall be transmitted via a director's declaration. The declaration will describe the following:

1. Data supporting the entanglement risk evaluation pursuant to subsection 29.80(c)(7)(A).

2. Relevant information informing management considerations from subsection 132.8(d).

3. Rationale for nexus between management considerations in subsection 132.8(d) and chosen recreational management action under 29.80(c)(7)(B).

4. Duration of management action.

(E) The director's declaration pursuant to subsection 29.80(c)(7)(D) shall provide a minimum of 5 days' notice before the delay or closure becomes effective.

(F) The director's declaration and/or any advisory notice shall be communicated via the department's "Whale Safe Fisheries" webpage located at https://wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries. At its discretion, the department may communicate declarations and/or advisory notices via additional formats.

(G) After the director implements a management action pursuant to subsection (c)(7)(B), he or she shall notify the commission and request that the commission schedule a public discussion of the management action at its next regularly-scheduled commission meeting.

(d) Crab loop traps may have up to six loops.

(e) Crab trap areas: Crab traps, including crab loop traps, may be used north of Point Arguello, Santa Barbara County, to take all species of crabs ~~(see regulations for take of Dungeness crabs in traps from commercial passenger fishing vessels in Section 29.85 of these regulations)~~.

(f) Shrimp and prawn traps may be used to take shrimp and prawns only. Trap openings may not exceed 1/2 inch in any dimension on traps used south of Point Conception nor five inches in any dimension on traps used north of Point Conception.

(g) Diving for crustaceans: In all ocean waters, except as provided in Section 29.05, skin and SCUBA divers may take crustaceans by the use of the hands only. Divers may not possess any hooked device while diving or attempting to dive. Divers may be in possession of spearfishing equipment so long as possession of such equipment is otherwise lawful and is not being used to aid in the take of crustaceans.

(h) Hand operated appliances: Spades, shovels, hoes, rakes or other appliances operated by hand may be used to take sand crabs and shrimp.

(i) Dip nets and Hawaiian type throw nets: Shrimp may be taken with dip nets and Hawaiian type throw nets north of Point Conception.

(j) Shrimp trawls: Shrimp beam trawls may be used to take shrimp only in San Francisco Bay waters east of the Golden Gate Bridge, and in San Pablo Bay. The beam trawl frame from which the net is hung may not exceed 24 inches by 18 inches. The trawl may be towed by motorized vessels but may not be retrieved by mechanical devices. Any fish, other than shrimp, caught in the trawl must be returned immediately to the water.

Note: Authority cited: Sections 200, 205, 265, 270, 275, 7075 and 7078, Fish and Game Code. Reference: Sections ~~110,~~ 200, 205, 265, 270, 275, 7050, 7055 and 7056, Fish and Game Code.

Proposed Regulatory Language

Section 29.85, Title 14 CCR, is amended to read:

§ 29.85. Recreational Take of Crabs

(a) Any individual who fishes for crabs using crab trap(s) pursuant to subsection 29.80(c), shall have in possession a valid Recreational Crab Trap Validation for the current license year (Section 701, Title 14, CCR).

~~(a)~~(b) Dungeness crabs (*Cancer magister*):

(1) ~~Closure:~~

Dungeness crab may not be taken from or possessed if taken from San Francisco Bay and San Pablo Bay, plus all their tidal bays, sloughs and estuaries between the Golden Gate Bridge and Carquinez Bridge.

(2) Open season: Fishing rules for Dungeness crab may be changed during the year or in-season by the director under the authority of subsection 29.80(c)(7). See subsection 29.80(c)(7). for additional information.

(A) Del Norte, Humboldt and Mendocino counties: From the first Saturday in November through July 30.

(B) All other counties: From the first Saturday in November through June 30.

(3) Limit: Ten.

~~(4) Not more than 60 crab traps are authorized to be used to take Dungeness crab from a vessel operating under authority of a Commercial Passenger Fishing Vessel License issued pursuant to Fish and Game Code Section 7920.~~

~~(5) Traps and trap buoys by a commercial passenger fishing vessel to take Dungeness crab under authority of this Section and Section 29.80 shall have the commercial boat registration number of that vessel affixed to each trap and buoy.~~

(~~6~~4) No vessel that takes Dungeness crabs under authority of this section, or Section 29.80, shall be used to take Dungeness crabs for commercial purposes.

(~~7~~5) Minimum size: Five and three-quarter inches measured by the shortest distance through the body from edge of shell to edge of shell directly in front of and excluding the points (lateral spines).

~~(b)~~(c) All crabs of the Cancer genus except Dungeness crabs, but including: yellow crabs, rock crabs, red crabs and slender crabs:

(1) Open season: All year. Fishing rules for crabs of the Cancer genus may be changed during the year or in-season by the director under the authority of subsection 29.80(c)(7). See subsection 29.80(c)(7). for additional information.

(2) Limit: Thirty-five.

(3) Minimum size: Four inches measured by the shortest distance through the body, from edge of shell to edge of shell at the widest part, except there is no minimum size in Fish and Game districts 8 and 9.

~~(c)~~(d) All crabs of the genus *Cancer*, including Dungeness crabs, yellow crabs, rock crabs, red crabs and slender crabs, may be brought to the surface of the water for measuring, but no undersize crabs may be placed in any type of receiver, kept on the person or retained in any person's possession or under his direct control; all crabs shall be measured immediately and any undersize crabs shall be released immediately into the water.

~~(d)~~(e) Sand crabs (*Emerita analoga*): Limit: Fifty.

Note: Authority cited: Sections 200, 205, 265 and 275, Fish and Game Code. Reference: Sections ~~110,~~ 200, 205, 265 and 275, Fish and Game Code.

Proposed Regulatory Language

Section 701, Title 14 CCR, is amended to read:

§ 701. Sport Fishing Forms and Fees

Application	Permit Fees (US$)	Replacement Processing Fees (US$)
(a) Declaration for Multi-Day Fishing Trip (FG 935 (Rev. 2/13)), incorporated by reference herein	5.75	
(b) 2014 North Coast Salmon Report Card	5.75	
(c) 2014 Sturgeon Fishing Report Card	7.50	
(d) 2014 Sturgeon Fishing Replacement Report Card and Replacement Fee	7.50	7.50
(e) 2014 Spiny Lobster Report Card	8.75	
(f) 2014 Spiny Lobster Report Card Non-Return Fee	20.00	
(g) 2014 Abalone Replacement Report Card and Replacement Fee	9.50	7.50
(h) 2021 Recreational Crab Trap Validation	2.25	

~~(h)~~(i) Pursuant to the provisions of Section 699, Title 14, the department shall annually adjust the fees of all licenses, stamps, permits, tags, or other entitlements required by regulations set forth in this section.

Note: Authority cited: Sections 200, 205, 265, 275, 713, 1050, 1053.1 and 7149.8, Fish and Game Code. Reference: Sections ~~110,~~ 200, 205, 265, 275, 713, 1050, 1053.1, ~~1055~~1055.1 and 7149.8, Fish and Game Code.

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Instructions and Code Citations:
SAM Section 6601-6616

STATE OF CALIFORNIA — DEPARTMENT OF FINANCE

ECONOMIC AND FISCAL IMPACT STATEMENT (REGULATIONS AND ORDERS)

STD. 399 (Rev. 10/2019)

ECONOMIC IMPACT STATEMENT

DEPARTMENT NAME	CONTACT PERSON	EMAIL ADDRESS	TELEPHONE NUMBER
Fish and Game Commission	Margaret Duncan	margaret.duncan@wildlife.ca.gc	(916) 704-3215

DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400	NOTICE FILE NUMBER
Amend Sections 29.80, 29.85, 701 CCR, Title 14, Re: Recreational Crab Marine Life Protection Measures	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:

- ☐ a. Impacts business and/or employees
- ☒ b. Impacts small businesses
- ☐ c. Impacts jobs or occupations
- ☐ d. Impacts California competitiveness
- ☐ e. Imposes reporting requirements
- ☐ f. Imposes prescriptive instead of performance
- ☒ g. Impacts individuals
- ☐ 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 (Agency/Department) estimates that the economic impact of this regulation (which includes the fiscal impact) is:

- ☒ 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: 64 CPFVs

Describe the types of businesses (Include nonprofits): N/A

Enter the number or percentage of total businesses impacted that are small businesses: N/A

4. Enter the number of businesses that will be created: none eliminated: none

Explain: Regulation to determine baseline of a recreational fishery, with no change in amount of fishing activity anticipated

5. Indicate the geographic extent of impacts: ☐ Statewide
☒ Local or regional (List areas): Coastal areas where recreational crab are trapped

6. Enter the number of jobs created: none and eliminated: none

Describe the types of jobs or occupations impacted: N/A

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:

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Instructions and Code Citations:
SAM Section 6601-6616

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? $ 141,180 / year

   a. Initial costs for a small business: $ 240 Annual ongoing costs: $ 120 Years: 1

   b. Initial costs for a typical business: $ 0 Annual ongoing costs: $ 0 Years: 1

   c. Initial costs for an individual: $ 2.25 to $42.25 Annual ongoing costs: $ 2.25 to $20.25 Years: 1

   d. Describe other economic costs that may occur: $2.25 crab trap validation alone; add($4 per buoy x 5-10 buoys) = $22.25 to $42.25 Annual=$2.25+ some replace 5 buoys.Total costs=average ongoing individual + CPFV costs = $141,180. See Addendum

2. If multiple industries are impacted, enter the share of total costs for each industry: Commercial Passenger Fishing Vessels (CPFV) 100% 2010-2019 Average of 64 CPFVs deployed crab traps on group fishing trips of the 373 CPFVs that submitted logs to CDFW

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.* $ N/A

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: Fish and Game Commission authority to regulate sport fishing in state waters to manage marine resources.

   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: Regulation benefits to the State's environment are: better information on recreational crab fishery activity to aid the management of marine resources for continued sport fishing and to reduce marine life entanglement risk. No direct impacts on health and welfare or worker safety.

2. Are the benefits the result of: ☐ specific statutory requirements, or ☒ goals developed by the agency based on broad statutory authority?

   Explain: Statute provides Fish & Game Commission authority to establish sport fishing regulations.

3. What are the total statewide benefits from this regulation over its lifetime? $ 2,061,374

4. Briefly describe any expansion of businesses currently doing business within the State of California that would result from this regulation: The proposed regulation is not likely to substantially increase or decrease recreational fishing activity su cient to induce the expansion of businesses currently doing business within the State.

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: Alt 1) Lower trap limits, which could constrain trap sharing, was anticipated to be incapitable with the fishery common practices with the potential of higher costs than the proposed Regulation. Alt 2) Validation would be required to pursue Crabs by all methods not only traps.

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Instructions and Code Citations:
SAM Section 6601-6616

ECONOMIC IMPACT STATEMENT (CONTINUED)

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered:

Regulation:	Benefit: $ 2,061,374	Cost: $ 141,180/year
Alternative 1:	Benefit: $ 2,061,374	Cost: $ >141,180/year
Alternative 2:	Benefit: $ 2,061,374	Cost: $ >141,180/year

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives: Unknown entanglement reductions with Regulation & Alts until in place & benefits are non-use values. Alt 1 may result in trappers needing more equipment. Alt2 more validations req'd.

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: Fisheries management regulations traditionally involve setting season length, and/or imposing gear, and/or bait restrictions.

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 through12 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: Proposed regulation will not impact investment incentives in the State.

The incentive for innovation in products, materials or processes: Proposed regulation will not impact innovation incentives in the State.

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: Reduced entanglements of non-target and listed marine life; obtain information on rec crab fisheries to mitigate risk and benefit the environment.

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Instructions and Code Citations:
SAM Section 6601-6616

ECONOMIC AND FISCAL IMPACT STATEMENT
(REGULATIONS AND ORDERS)
STD. 399 (Rev. 10/2019)

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 _____

_____

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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 The CA Department of Fish and Wildlife anticipates recreational crab trap validation fee revenue of about $13,500 (6,000 @ $2.25 ea) for program administration and to fund the management of the marine resources.

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
DocuSigned by: Dennis Farrell E8B0B525880C4F6...	9/10/2020

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
DocuSigned by: Melissa A. Miller-Henson 74DED80ABE5A488... 9/15/2020	

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

STD 399 Addendum

Amend Sections 29.80, 29.85 and 701, CCR, Title 14

Re: Recreational Crab Marine Life Protection Measures

ECONOMIC IMPACT STATEMENT

Background

The principal intent of the proposed regulation is to minimize entanglement risks as well as to improve marine resource management through the collection of key fishery activity information. Department of Fish and Wildife recreational fishing survey data[1] indicate that at least 6,000 individuals engage in recreational crab trap fishing and would be affected by changes in requirements regarding: enhanced gear marking, service intervals; trap limits, Director authority to restrict take, and a new validation program.

Commercial Passenger Fishing Vessel (CPFV) operators provide recreational fishing trips for dozens of ocean species, and those who provide crab trapping (average of 64 vessels per 2010-2019 CPFV log data[2]), would also be directly affected by the proposed regulations. CPFVs operating in California are characterized as small businesses (per CA GOV Code Article 2, Section 11342.610) as all are independently owned and operated and not dominant in their field of operation. Additional details on CPFVs, trips, and trips for crab are shown in Table 2. in the Appendix to this Addendum.

The proposed regulations introduce five elements for the recreational crab fishery:

- **Enhanced Gear Marking Costs:** All recreational crab traps must be attached to a Main Buoy that is at least 5 inches in diameter and 11 inches long. With the proposed regulation, all crab participants must also mark each crab trap with a red Marker Buoy that is 3 inches in diameter and 5 inches long, which would help identify gear as originating from the recreational crab fishery should it entangle marine life. The extra buoy is widely available at an estimated cost of $4.00 each. Individuals may have up to ten traps although most have between two and five. Using the high-end average quantity of 5 traps x $4.00 for each additional buoy = $20.00. The maximum 10 traps per crab trap operator x $4.00 for each additional buoy = maximum of $40.00 in initial costs. Annual ongoing costs would be the potential replacement of 5 buoys or $4.00 x 5 = $20.00. CPFVs have a maximum of 60 buoys that would entail about $240 in initial costs and about $120 in annual ongoing maintenance costs.

[1] CDFW, California Recreational Fishing Survey (CRFS), data extracts for 2015 – 2019.
[2] CDFW, CPFV annual reporting logs data extracts: 2010 – 2020.

- **Service Interval:** Set a maximum service interval of 9 days, which would help reduce lost and abandoned traps and prevent fishermen from storing gear in the ocean when not actively fishing. This component of the regulation has no cost impacts to individuals or businesses.
- **Trap Limit:** Establish an individual trap limit of 10 traps per operator, which would reduce risk of entanglement by limiting the total number of vertical lines and determine the baseline effort level for further analyses. This does not affect the number of hoop nets, crab loop traps or take by hand. This component of the regulation has no costs impacts to individuals because most crab trap participants have between two and five traps and those who deploy the maximum 10 crab traps already possess the gear. The number of traps that a CPFV can deploy remains the same under the amended subsection 29.80(c)(6) (language which was moved from 29.85(a)(4)).
- **Director Authority:** The Fish and Game Commission (Commission) currently has exclusive management authority over the recreational fishery. The proposal would provide authority for the Director of the Department to take in-season action to reduce the risk of marine life entanglement. This component of the regulation is not anticipated to have cost impacts to individuals. However, CPFV operations could be impacted depending on the percentage of their group fishing trips that are solely or predominantly for crab trapping. Vessels that pursue multiple species could more readily shift effort away from trap-taken crabs should crab season delays or closures occur.
- **Trap Validation Program:** Require all individuals using recreational crab traps to purchase an additional Recreational Crab Trap Validation. This would allow the Department to track individuals who participate in the recreational crab fishery and contact them for survey efforts. The surveys in turn would allow the Department to collect crucial information it needs to better manage the fishery and address entanglement risk in the recreational fishery. A trap validation is a way for a consumer to pay a fair share to contribute to management of the target species, habitat, or specific area. If the validation is purchased at the time the license is purchased, it is imprinted on the license. If purchased separately, then a separate receipt-document is printed to be held by the fisher while trapping.

Table 2. in the Appendix contains CPFV data on the number of vessels and the share that have trips reporting the take of crab. But, it is not currently known how many individuals pursue crabs with traps while aboard CPFVs; depending on size, CPFVs take anywhere from six to about 30 passengers. Department survey data indicate that approximately 6,000 individuals pursue crabs with traps on their own. Information gathered as a result of this regulation will help to more accurately identify the number of fishers in each group.

The fee to recover reasonable administrative and program costs has been determined to be $2.25 as shown in Table 1. Item Fee Calculation for Recreational Crab Trap Validation.

Table 1. Item Fee Calculation for Recreational Crab Trap Validation

START UP COSTS

Cost Description	Hours	Rate*	Total
ALDS IT support: Item setup/ configuration /reporting			
Information Technology Specialist I	8	$96.42	$771.36
Total Startup Costs			$771.36
Amortized over 5 years:			$154.27
Amortized Startup Costs per Item			$0.03

ONGOING ANNUAL PROGRAM COSTS

ALDS IT support: Item Review			
Information Technology Specialist I	1	$71.48	$71.48
LRB IT support			
Associate Governmental Program Analyst (AGPA)	25	$53.77	$1,344.25
Program technician II (PTII)	42	$32.90	$1,381.80
Total Annual Program Costs			**$2,797.53**
Annual Program Costs per Item			**$0.47**

ONGOING ANNUAL PROGRAM COSTS
ITEM FEE CALCULATION

Amortized Startup Cost per Item Sold			$0.03
Annual Program Cost per Item Sold			$0.47
Overhead for above costs		24%	$0.17
ALDS System costs Per transaction			$0.78
LRB Operations costs Per transaction			$0.89
Item Fee			**$2.33**
Item Fee (rounded to nearest .25) per FGC Section 713			**$2.25**

*Rate per hour = hourly wage with benefits
Sources: CalHR for State Employee by Classification Payscales; CDFW Budgets Branch for Staff Benefit Rates 2019/20 and Departmental Overhead Rates 2019/20.

A. ESTIMATED PRIVATE SECTOR COSTS IMPACTS

Answer (from STD 399): b. Impacts small businesses; g. Impacts individuals

B. ESTIMATED COSTS

a. **Initial costs for a small business:** = $240 to purchase buoys at $4 each for 60 recreational crab traps, the maximum allowed per CPFV. Buoys can be purchased at most outdoor supply retailers or online. CPFV operators themselves do not have to purchase the crab trap validation, but individuals (passengers) who expect to take crab must.

   Annual ongoing costs: = $120 to replace an estimated 30 buoys (due to damage or loss) or $4.00 x 30 = $120.00 per CPFV.

b. **Initial costs for an individual:** = a total that ranges from $2.25 to $42.25. All individuals that trap crabs incur the cost of a $2.25 validation. For the not yet known number of fishers who pursue crab with traps aboard CPFVs, that is the only new cost. For those that deploy crab traps on their own, the new gear marking requirement for an additional buoy on each crab trap, has an estimated cost of $4.00 each for the average quantity of 5 traps = $20. $2.25 + $20 = $22.25 or up to the maximum 10 traps = $42.25 for initial costs. Buoys can be purchased at most outdoor supply retailers or online.

Annual ongoing costs: = $2.25 to $22.25. The required crab trap validation at $2.25, and for non-CPFV fishers, the potential replacement of 5 buoys (due to damage or loss) or $4.00 x 5= $20.00 + $2.25 = $22.25.

Total Statewide costs: = $141,180, consisting of:

- (Crab Trap Validation fee of $2.25 for 6,000 non-CPFV recreational crab fishers + unknown number of CPFV crab fishers = **$13,500**) **+**
- (average annual buoy costs of $20 x 6,000 non-CPFV individual recreational crab fishers = **$120,000**) **+**
- ($120 buoy costs per year for 64 CPFVs = **$7,680**)

C. ESTIMATED BENEFITS

Total statewide benefits: $2,061,374

There are some challenges in the quantification of the anticipated benefits of the proposed regulation because the intended outcomes are comprised of non-use values. The aim is to help reduce the entanglement risk posed by recreational crab fisheries activities towards marine animals protected by the federal Endangered Species Act and Marine Mammal Protection Act. The proposed regulations would also help the state obtain valuable information on recreational crab fisheries to help the state better mitigate entanglement risk as well as better manage the crab fisheries overall to meet the state's various policy goals.

The value of reduced unintended marine life entanglements in a recreational fishery is inherently difficult to monetize. Any unintended catch, known as “bycatch,” whether a listed marine mammal, sea turtle or any other non-target species, could not be traded in the market per codes regarding recreational take. The valuation of bycatch in this case, would be entirely “non-use” (or “non-consumptive”) values, that could be estimated with contingent valuation surveys of residents and non-residents as to how much they would pay to protect the various non-target marine wildlife from harm due to this recreational fishery. Such contingent valuation information informs the derivation of the existence, bequest, and altruistic values which are likely to be substantial, given the widely held concern for whales in particular. Additionally, the ecosystem value of a whale’s’ life, or the contribution of that life to the nutrient composition that supports other marine life, along with beneficial carbon sequestration, and more has been estimated to be $2 M per whale (Chami et al., 2019[3]).

Given these difficulties, this analysis first focuses more narrowly on the monetized market-traded direct uses, such as expenditures in the whale-watching industry, supplemented with monetized travel costs research to estimate the benefits of reducing the risk of marine life entanglement. Whale-watching is an industry that draws value from an abundance of whales that will attract more whale-watchers. Whale-watchers derive value from the sighting of whales and in theory the ticket price along with the travel costs of getting to the shore equal the “price” of seeing whales. The value of the whale-watching industry is evaluated as a proxy for the value of an abundance of whales.

A literature survey[4] of the economic contribution of the whale watching industry in California yielded an estimated $44,614,500 to $59,902,500 in direct expenditures annually. The multipliers for whale-watching tourism expand the initial direct expenditure to a range of $127,894,900 to $171,720,500 in total economic value for the whale-watching industry, that supports 79 jobs per $1 million in direct expenditures. With a total economic value of the industry the next steps taken to arrive at the monetary value of an individual whale are shown below.

Total Economic Value of Whale-Watching Tourism
[Range = $127,894,900 to $171,720,050]

The travel cost research that traces the additional real costs of travel (e.g. gas and time) to estimate the consumer surplus of whale-watching beyond the direct ticket

[3] Chami, R., Cosimano, T., Fullenkamp, C. and S. Oztosun. 2019. Nature’s Solution To Climate Change: A strategy to protect whales can limit greenhouse gases and global warming, Finance & Development, December 2019.
[4] Erich Hoyt and E.C.M.Parsons (2014); Knowles, T., Campbell, R. (2011); Linwood Pendleton, (2006).

costs was also surveyed. Consumer surplus is the benefit that consumers reap beyond what is paid for the experience.

Travel Cost as a Measure of Consumer Surplus
[Average total = $52,400]

The average total travel costs values were added to the total economic impact of direct expenditures in the state. That sum was then divided by the number of whales of the species traveling in the water depths and areas that could be most likely vulnerable to entanglement with crab gear lines. This provides a measure of the total economic value of the whale watching industry and travel cost consumer surplus per whale.

($127,894,900 + $52,400)/2,442 whales = $52,400 per whale
($171,720,050 + $52,400)/2,442 whales = $70,348 per whale

The number of whales off the California coast at risk of entanglement in recreational crab gear is the other key factor in assigning a value for the benefits of this regulatory action. Records on whale entanglement off the California coast show that at least three whales have been entangled over recent years in recreational crab gear (Draft Conservation Plan for California's Commercial Dungeness Crab Fishery 2020). This regulation is intended to reduce the frequency of entanglements of large whales and sea turtles.

The total benefit would be about $52,400 to $70,348, with an average of $61,374 for each whale that is not entangled in recreational crab gear. If the $2M ecosystem services value (Chami, et al., 2019) of that whale is included the proposed regulation benefits sums to **$2,061,374**.

D. ALTERNATIVES TO THE REGULATION

1. List Alternatives Considered

Alternative 1: Lower Trap Limit Without Gear Sharing

One alternative considered was the adoption of a trap limit that would appreciably reduce the number of recreational crab traps deployed in the ocean. Initial discussions included a range from three to ten traps. Based on stakeholder feedback, a more stringent trap limit would constrain an fishers' ability to share gear through written notes by trap owners. Allowing individuals to share gear with other fishers may also help to achieve the goal of limiting the total number of traps fished by area. As a result, a higher trap limit was chosen, and the issue of gear sharing may be addressed in a future rulemaking. The 10-trap individual limit will be used primarily as a benchmark for Department and Commission staff to determine maximum effort.

Alternative 2: Unlimited Validation

The Department considered requiring that *all* crab fishers obtain the validation, and not just those fishing with crab traps. There are many unknowns about the number of individuals fishing with the various methods, and the validation would provide an opportunity for information gathering. However, the purpose of the regulation is to gather information to inform ways of minimizing whale entanglement risk, and crab fishers using methods other than crab traps deployed from boats have no known contribution to that risk. Therefore, the regulation focuses solely on recreational fishers pursuing the take of crab using crab traps.

D2. Summarize the Total Statewide Costs and Benefits from this Regulation and Each Alternative Considered

Regulation Costs: $141,180, consisting of: (Crab Trap Validation fee of $2.25 for 6,000 non-CPFV recreational crab fishers + unknown number of CPFV crab fishers = **$13,500**) **+** (average annual buoy costs of $20 x 6,000 non-CPFV individual recreational crab fishers = **$120,000**) **+** ($120 buoy costs per year for 64 CPFVs = **$7,680**).

Regulation Benefits: reduction of entanglement risk posed by recreational crab trap fishing activities towards marine animals, particularly those protected by the federal Endangered Species Act and Marine Mammal Protection Act, valued at: **$2,061,374**. The proposed regulations would also help the state obtain valuable information on recreational crab fisheries to help the state better mitigate entanglement risk as well as better manage the crab fisheries overall to meet the state's various policy goals.

Alternatives

The following two alternatives represent likely costs and benefits from two modifications of the rulemaking that were not selected.

Alternative 1 Costs: Greater than $141,180, that is greater than the regulation costs as specified above, but since Alternative 1 would be at odds with current practices, it is likely to entail more costs to individual fishery participants as parts of the recreational sector currently rely heavily on the ability to share gear.

Alternative 1 Benefits: were expected to be similar to the proposed regulation, **$2,061,374**, but at higher costs to the affected recreational fishery participants.

Alternative 2 Costs: An estimated 1,000 crab fishers use methods other than crab traps deployed from boats, such as hoop nets and manual extraction from the sandy shoreline. If those fishers also had to purchase the $2.25 Recreational Crab Validation, total statewide individual costs would increase annually by **$2,250**.

Alternative 2 Benefits: Anticipated benefits would not be increased by including crab fishers using methods other than deploying crab traps from boats since those other methods do not increase the risk of whale entanglements. The benefits are estimated to be equivalent to the proposed regulation: **$2,061,374.**

FISCAL IMPACT STATEMENT

A. A. FISCAL EFFECT ON LOCAL GOVERNMENT

Answer: 5. No fiscal impact exists. This regulation does not affect any local entity or program.

B. FISCAL EFFECT ON STATE GOVERNMENT

Answer: 4. Other. Explain: The proposed regulations are anticipated to introduce some start-up and ongoing implementation and enforcement costs that will be covered by the anticipated recreational crab validation revenue.

The Department expects to sell at least 6,000 recreational crab trap validations at the cost of $2.25 for an annual validation. The additional sales revenue anticipated from 6,000 validations sold is **$13,500.** The Commission does not anticipate any savings to State agencies or costs/savings in federal funding to the State.

C. FISCAL EFFECT ON FEDERAL FUNDING OF STATE PROGRAMS

Answer: 3. No fiscal impact exists. This regulation does not affect any federally funded State agency or program.

Appendix: Table 2. CPFV Vessels and Trips Involving Crab Take: 2010-2020

Year	All Vessels	Vessels with Crab	% Crab Vessels	All Trips	Trips with Crab	% Crab Trips
2010	314	41	13.1%	23,801	618	2.6%
2011	316	55	17.4%	26,144	1,173	4.5%
2012	339	64	18.9%	29,455	1,207	4.1%
2013	361	72	19.9%	31,252	1,214	3.9%
2014	418	79	18.9%	36,465	1,362	3.7%
2015	391	43	11.0%	40,060	657	1.6%
2016	398	76	19.1%	35,101	1,523	4.3%
2017	371	64	17.3%	34,087	1,089	3.2%
2018	423	71	16.8%	35,345	1,129	3.2%
2019	399	75	18.8%	35,051	1,460	4.2%
2020*	280	23	8.2%	6,482	129	2.0%
2010-2019 Average	373	64	17.2%	32,676	1,143	3.5%

*YTD - July 29, 2020; 2020 is excluded from annual average 2010-1019.

Source: California Department of Fish and Wildlife: CPFV annual reporting logs data extracts: 2010 – 2020.

Recreational Crab Marine Life Protection Measures

Proposed Amendments to Sections 29.80, 29.85 and 701

14 October 2020

Presented to:

Fish and Game Commission

Presented by:

Ryan Bartling

Senior Environmental Scientist
Marine Region

Inclusion of ALL Trap Caught Sport Crab

- Stakeholder engagement started >1 year ago
- Initial scoping/discussions focused on Dungeness crab
- Entanglement risk is from ALL crab trap gear/line
- Drafting revealed broader approach needed to address risk and enforcement
- Proposed regulations apply to all crab

Proposed Changes to Recreational Crab Fishery

Overview of proposals:

1. Unique “marker buoy” (simple red buoy)
2. Trap limit program (10 traps per individual)
3. Service interval requirement (9 days)
4. Recreational Crab Trap Validation (low cost)
5. Director’s authority (minimize entanglement risk)

Proposed Changes to Recreational Crab Fishery (cont. 1)

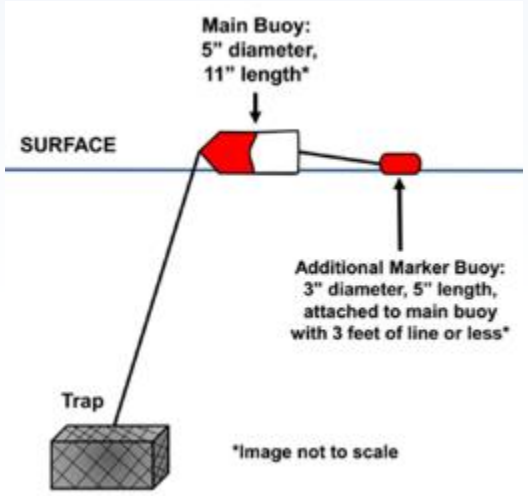
§ 29.80: Gear Restrictions for Recreational Take of Saltwater Crustaceans

- (b)(1) and (3) Revise: hoop net language to remove redundancy
- (c)(3)(A) Add: Main buoy marking requirements, buoy must 5 x 11 inches
- (c)(3)(A)1. & 2. Reorg: GO ID # and CPFV license buoy marking requirements into this subsection

Proposed Changes to Recreational Crab Fishery (cont. 2)

§ 29.80: Gear Restrictions for Recreational Take of Saltwater Crustaceans

- (c)(3)(B) Add: Marker buoy requirements, 3 x 5-inch red buoy (readily available)
- (c)(3)(C) Reorg: CPFV trap marking requirements into this subsection
- (c)(5) Add: Service interval <= 9 days



Proposed Changes to Recreational Crab Fishery (cont. 3)

§ 29.80: Gear Restrictions for Recreational Take of Saltwater Crustaceans

- (c)(6)(A) Add: Individual trap limit of 10 and provision for servicing up to 10 additional traps with written permission
- (c)(6)(B) Move: CPFV trap limit to this subsection; CPFV trap limit will apply for all crab species

Proposed Changes to Recreational Crab Fishery (cont. 4)

§ 29.80: Gear Restrictions for Recreational Take of Saltwater Crustaceans

- (c)(7)(A) Add: Director's authority using Risk Assessment Mitigation Program (RAMP) § 132.8
  - Director evaluates risk of entanglement prior to recreational opener
  - Risk will be determined based on consistency with § 132.8 on a monthly basis
  - Data driven process (based on best available science)

Proposed Changes to Recreational Crab Fishery (cont. 5)

§ 29.80: Gear Restrictions for Recreational Take of Saltwater Crustaceans

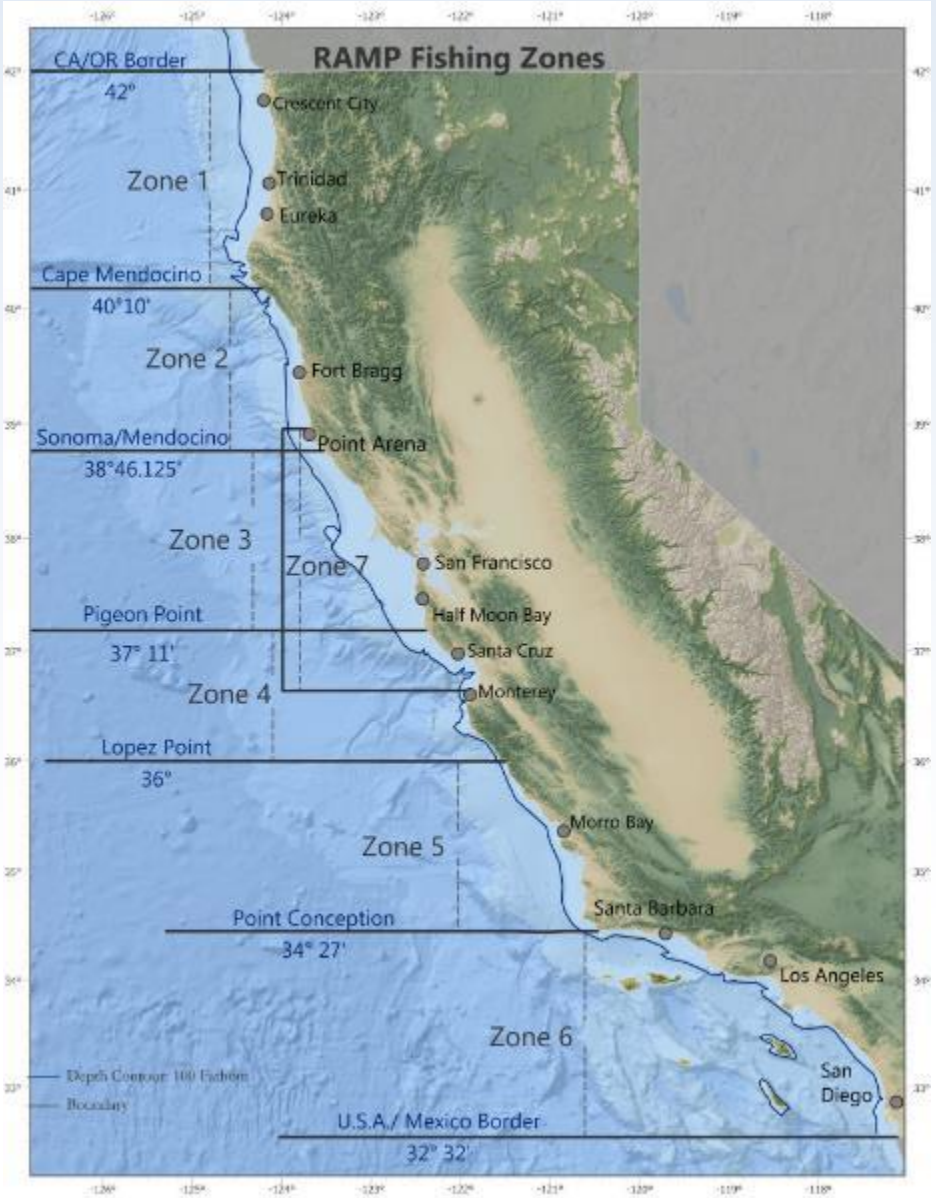
- (c)(7)(B) and (C) Add: Director's authority using Risk Assessment Mitigation Program (RAMP) § 132.8
  - Director shall implement management actions to minimize risk after consulting Commission
  - Actions include: Advisory, delay or closure
  - Management Actions can be at the Fishing Zone level or statewide

Proposed Changes to Recreational Crab Fishery (cont. 6)

§ 29.80: Gear Restrictions for Recreational Take of Saltwater Crustaceans

- (c)(7) Add: Director's authority using Risk Assessment Mitigation Program (RAMP) § 132.8
  - (D) Notice of management action transmitted by Director's declaration
  - (E) Minimum of 5-days prior to implementation
  - (F) Communicated through Whale Safe Fisheries webpage
  - (G) Director will notify Commission and schedule discussion

RAMP Fishing Zones



Proposed Changes to Recreational Crab Fishery (cont. 7)

§ 29.85 Recreation Take of Crab

- (a) Add: Recreational Crab Trap Validation to identify anglers for communications
- (a)(b) Amend and re-number: San Francisco Bay closure for clarity
- (b)(2) and (c)(1) Add: Fishing rules may change
- (a)(4)and(5) Move: Subsections to §29.80

§ 701 Sport Fishing Forms and Fees

- (h) Add: Crab Trap Validation fee


Credit: CDFW

Recreational Crab Rulemaking Timeline

2019 – 2020 – Scoping and Stakeholder Discussions

August 2020 – Notice Hearing

October 2020 – Discussion Hearing

December 2020 – Adoption Hearing

January 2021 – Office of Administrative Law Review

February 2021 – Submit to Secretary of State

Summer/Fall 2021 – Outreach Conducted

November 2021 – Regulations Effective

Questions?

Whale Safe Fisheries

www.wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries

Ryan Bartling

Ryan.Bartling@wildlife.ca.gov

RE: Recreational Dungeness crab proposal

Bartling, Ryan@Wildlife <Ryan.Bartling@wildlife.ca.gov>

Tue 08/25/2020 04:15 PM

To: info@fishemeryville.com <info@fishemeryville.com>
Cc: FGC <FGC@fgc.ca.gov>; Fonbuena, Sherrie@FGC <Sherrie.Fonbuena@fgc.ca.gov>

Good afternoon Andy,

Thank you for providing comments on the proposed sport crab regulations. I will forward your comments to the Fish and Game Commission for consideration at their next scheduled meeting.

Ryan Bartling

From: info@fishemeryville.com <info@fishemeryville.com>
Sent: Tuesday, August 25, 2020 3:04 PM
To: Bartling, Ryan@Wildlife <Ryan.Bartling@wildlife.ca.gov>
Subject: Recreational Dungeness crab proposal

Warning: This email originated from outside of CDFW and should be treated with extra caution.

Ryan,
We have a lot of reservation regarding the proposal to amend recreational dungeness crab fishing, specifically CPFV regulations. If I understand your numbers correctly, from the period 1982 to 2019, 3 of the 506 known West Coast entanglements have been determined to be caused by Ca recreational gear. (44% of the entanglements unknown gear.) Statistically speaking that's one entanglement every 5.6 years or .0059% of the entanglements. Very low statistically speaking and overall very little evidence to suggest CA recreational gear poses any serious threat to whales or sea turtles. The evidence of Commercial gear is far more significant than Rec gear and treating both industries the same unfair to the recreational sector.

Further more, if you are asking CPFV's to require each passenger, each day to hold a $2.25 Trap Validation stamp you are not factoring in the loss of revenue each boat will suffer due to the additional cost an angler must occur daily.

The Dept is was out of bounds lumping Commercial and Recreational Crab sectors together with whale risk. One suggestion would be to implement the gear marking requirements FIRST to accurately determine the risk recreational gear has to whale entanglements. As it relates to validation stamp a one time fee to CPFV's of 2.25 x 60 pots of $135.00 might be considered.

Our Crab trips are some of our most sought after trips and in high demand. Irrationally delaying the season and adding additional fee's to our operations that are already under stress is poor form on the Depts part.

Thank you,

Andy Guiliano

Fish Emeryville
3310 Powell Street
Emeryville, CA. 94608
Bait Shop: (510)652-3403
Hotline: (510)652-3474
www.FishEmeryville.com

Recreational Dungeness Crab - CPFV Economic Impact Report Comment.txt

From: tom@hulicat.com
Sent: Sunday, August 30, 2020 7:26 AM
To: Lehr, Stafford@Wildlife; Shuman, Craig@Wildlife; Ian.Tanaguchi@wildlife.ca.gov; Puccinelli, Robert@Wildlife; Stefanak, Mike@Wildlife; Loum, Mary@Wildlife; Mastrup, Sonke@Wildlife; FGC
Subject: Recreational Dungeness Crab - CPFV Economic Impact Report Comment
Attachments: Recreational Dungeness Crab.docx; CPFV EconomicImpactReport.xlsx

CA Department of Fish & Wildlife and CA Fish & Game Commission,

I'm enclosing detail to improve the economic impact report of the proposed change to the recreational
Dungeness crab regulations currently being discussed. Please also consider adding any fee for
Dungeness crab fee to the Lifetime License package. Feel free to contact me about this.

Regards,

Tom Mattusch
Huli Cat
650.726.2926 W

Recreational Dungeness Crab – CPFV Input 8/29/2020

To:
Stafford Lehr
Craig Shuman
Ian Tanaguchi
Robert Puccinelli
Mike Stefanick
Mary Loum
Sonke Mastrup
Fish & Game Commission
Marine Resources Committee

As a CPFV Owner/Operator, I'm asking you to revise the Economic Impact Report (EIR) for California Passenger Fishing Vessels.

I've attached a short spreadsheet to show the buoy revision. A buoy cannot simply be added to another buoy as pictured adjacent to the 5"x11" buoys. The line to existing buoys cannot be simply untied and retied. Assume 1 roll of SuperTec 3/8" neutrally bouyant line, $173.85 +tax+shipping. 60 5'x11" buoys from West Marine $7.99+tax. Labor was not included in the existing EIR. Passenger vessel Deckhands and crew are not going to take a couple days and set this up for nothing. My crew gets $150 per day for Deckhand or general labor. Assume 2 crew for 2 days, $300. 60 red buoys, $240 + tax. EIR $1619 for CPFV. This does not cover labor for painting and branding or marking the 5"x11" buoy, only tying. Double the labor for painting and marking, (not included in spreadsheet).

Red Buoys
I spoke to 3 large wholesale fishing tackle dealers. None could supply the red buoys in sufficient quantity for the 2020 season. I understand this could affect 2021.

Feedback on Proposed Regulation
I request the $2.25 crab fee be added to the Lifetime License Holders package.

Please feel free to contact me with any questions or comments.

Regards,

Capt Tom Mattusch
Huli Cat 650.726.2926W

Item	cost	tax	shippping	tota	x 60
Crab buoy 5"x11'	.99	0.72		8.7	22.6
red float		0.36		.3	61.6
Labor	600			00	
SuperTec 3/8"	73.85	15.6465	5	234.4965	
CPFV EIR Total				618.697	

STAFF SUMMARY FOR AUGUST 19-20, 2020

16. RECREATIONAL SEA URCHIN

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

Consider authorizing publication of notice of intent to amend regulations concerning recreational take of sea urchin at Caspar Cove, Mendocino County and Tanker's Reef, Monterey County for a period of three years.

Summary of Previous/Future Actions

• Adopted emergency regulations to take purple sea urchin at Caspar Cove	Feb 21, 2020; Sacramento
• Consider 90-day extension of emergency regulations (Agenda Item 4, today)	Aug 19-20, 2020; Webinar/Teleconference
• **Today's notice hearing for Caspar Cove and Tanker's Reef**	**Aug 19-20, 2020; Webinar/Teleconference**
• Discussion hearing	Oct 14-15, 2020; Webinar/Teleconference
• Adoption hearing	Dec 9-10, 2020; Webinar/Teleconference

Background

Today's Agenda Item 4 (recreational purple sea urchin) recaps the background and environmental context that led FGC to take emergency action in Feb 2020 to temporarily remove the recreational bag limit for purple sea urchin inside Caspar Cove, Mendocino County (see Exhibit 1 for additional background). The staff summary for Agenda Item 4 also highlights the need to continue the provision authorizing urchin removal at Caspar Cove, in order for DFW and partners to initiate the planned study to monitor and evaluate removal efforts. The standard rulemaking proposed under this agenda item would continue the take provisions within Caspar Cove for a period of three years only, which would support data collection to inform the state's response to the loss of the kelp forests within state waters as was intended.

DFW additionally proposes adding a second location, Tanker's Reef in Monterey County, to the proposed regulations based on a public regulation petition (#2020-001) scheduled for action under Agenda Item 14 (this meeting; see exhibits 2 and 4 of Agenda Item 14 for the petition and DFW recommendations memo).

At its Jun 2020 meeting, FGC requested DFW work with the petitioner, Keith Rootsaert, to clarify alternative options that he verbally requested. DFW reviewed the petition and subsequent informal revisions; Mr. Rootsaert was responsive throughout the review process.. If FGC grants Petition 2020-001 as recommended by DFW (under Item 14), this proposed rulemaking will authorize take of red sea urchin as well as purple sea urchin at Tanker's Reef. DFW recommends that removal of the daily recreational bag limit for both red and purple urchins at Tanker's Reef may promote kelp recovery and will enable further evaluation of kelp restoration techniques. While red sea urchin is a commercial fishery in other regions, commercial harvest is minimal in the proposed area and the proposed activity is further bounded by a small geographic scope, the experimental nature, and the limited time frame for the authorization as a precaution.

In addition, Tanker's Reef requires a unique monitoring structure. In contrast to Caspar Cove, DFW and partners do not have capacity to also conduct the scientific monitoring and oversight they believe are necessary to support approval of such experimental efforts. DFW has worked closely with the California Ocean Protection Council (OPC) and the Marine Bay National Marine Sanctuary (MBNMS) to establish specific performance criteria to evaluate the efficacy of the proposed activity at Tanker's Reef, as well as to evaluate the impacts to the immediate environment. As indicated in significant public comments below, OPC and MBNMS conditionally do not oppose the effort.

DFW has prepared a memo outlining its request to go to notice (Exhibit 2). The initial statement of reasons for regulatory action (ISOR) is being prepared and the notice will be completed and published based on FGC action.

Significant Public Comments

DFW, OPC, and MBNMS provided a joint letter to convey conditional support for adding Tanker's Reef, provided that outcomes "explicitly inform future management" and that the petitioner (1) evaluate the efficacy of community led efforts in-water culling activities and report findings, and (2) evaluate the potential ecological impacts from such methods. Data collected from these activities are expected to be reported to DFW using specific criteria identified in the letter (Exhibit 3).

Recommendation

***FGC staff*:** Approve request to issue notice of regulatory action as recommended by DFW to (1) authorize unlimited recreational take of purple sea urchin at Caspar Cove, Mendocino County as proposed for a period of three years, and (2) authorize unlimited recreational take of purple sea urchin and red sea urchin at Tanker's Reef, Monterey County as proposed, for a period of three years with adherence to the interagency monitoring and reporting criteria specified in Exhibit 3.

DFW: Approve request to issue notice of regulatory action to initiate a regular rulemaking to allow unlimited take of purple sea urchin at Caspar Cove and purple and red sea urchin at Tanker's Reef for a period of three years.

Exhibits

1. Staff summary from Feb 21, 2020 FGC meeting (for background purposes only)
2. DFW memo requesting authorization for notice, received Aug 5, 2020
3. Joint letter from California Ocean Protection Council, DFW and Monterey Bay National Marine Sanctuary, Aug 5, 2020

Motion/Direction

Moved by _____ and seconded by _____ that the Commission authorizes publication of a notice of its intent to amend Section 29.06, Title 14, California Code of Regulations, related to the recreational take of purple sea urchin at Caspar Cove in Mendocino County for three years.

AND (next page)

Moved by _____ and seconded by _____ that the Commission authorizes publication of a notice of its intent to amend Section 29.06, Title 14, California Code of Regulations, related to the recreational take of purple and red sea urchin at Tanker's Reef in Monterey County for three years.

State of California
Department of Fish and Wildlife

M e m o r a n d u m

Original on file,
received August 5, 2020

Date: August 4, 2020

To: Melissa Miller-Henson, Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: Agenda Item for the August 19, 2020, Fish and Game Commission Meeting Re: Request for Notice Authorization Re: Amendments to Recreational Sea Urchin Regulations for Caspar Cove and Tanker's Reef

The California Department of Fish and Wildlife (Department) requests the Fish and Game Commission (Commission) authorize publication of notice of its intent to consider amendments to existing regulations in Section 29.15, Title 14, California Code of Regulations (CCR) to remove the daily recreational bag limit for the take of sea urchins at Tanker's Reef, Monterey County, and Caspar Cove, Mendocino County.

Unlimited take of purple sea urchin is currently allowed in Caspar Cove, Mendocino County through an emergency rule filed in March 2020, with a pending readoption that will extend the amendment to December 2020. Due to the impact of the COVID-19 pandemic, effort to take urchins in Caspar Cove has been minimal and a standard rulemaking is required to allow data collection and conservation activities to continue within Caspar Cove. The Department has evaluated Petition #2020-001 and agrees that removal of the daily recreational bag limit for red and purple urchins at Tanker's Reef may promote kelp recovery and allow for further evaluation of kelp restoration techniques.

This proposed action would extend the recreational urchin removal activities at Caspar Cove and, in response to a petition for regulatory change, would allow for a community led urchin removal effort at Tanker's Reef in Monterey. Options that will be included for Commission consideration in the proposed rulemaking will be a sunset date of three years and the possible inclusion of both red and purple urchins at Tanker's Reef.

In conjunction with the proposed regulations, the Department will work closely with the petitioner and other partners to establish specific performance criteria to evaluate the efficacy of the proposed activity at Tanker's Reef.

If you have any questions or need additional information, please contact Dr. Craig Shuman, Marine Regional Manager at (916) 373-5491. The public notice for this rulemaking should identify Environmental Scientist, Anthony Shiao, as the Department's point of contact for this rulemaking. His contact information is

(805) 560-6056 or Anthony.Shiao@wildlife.ca.gov.

ec: Stafford Lehr, Deputy Director
Wildlife and Fisheries Division
Stafford.Lehr@wildlife.ca.gov

Craig Shuman, D. Env., Regional Manager
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Craig.Shuman@wildlife.ca.gov

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Anthony Shiao, Environmental Scientist
Marine Region
Anthony.Shiao@wildlife.ca.gov

State of California
Department of Fish and Wildlife

Signature on file
Received September 25, 2020

Memorandum

Date: September 24, 2020

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: Certificate of Compliance to Amend Section 29.06: Recreational take of Sea Urchin

The Fish and Game Commission (Commission) authorized publication of its intent to amend Section 29.06 of Title 14 of the California Code of Regulations (CCR) regarding the recreational take of sea urchins, at its August meeting. Transmittal of the attached Certificate of Compliance Initial Statement of Reasons (ISOR) serves to make the emergency regulations authorized under OAL# 2020-0309-02E permanent, in addition to adding a new experimental urchin removal site at Tanker Reef in Monterey County, as well as a sunset date of April 1, 2024. The Commission has authorized publication of this ISOR prior to the scheduled discussion hearing in October.

The proposed regulation aims to test the effectiveness of kelp restoration through sea urchin removal by recreational divers, and includes the following:

- Maintain the existing regulation in Section 29.06 re-adopted under emergency action OAL# 2020-0901-01EE allowing recreational divers to take unlimited number of purple sea urchins by hand in Caspar Cove, Mendocino County until April 1, 2024.
- Add the ability for recreational divers to take unlimited number of red sea urchins and purple sea urchins by hand at Tanker Reef, Monterey County until April 1, 2024.

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.

ec: Stafford Lehr, Deputy Director
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Craig Shuman, D. Env., Regional Manager
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State of California
Fish and Game Commission
Initial Statement of Reasons for Regulatory Action
(Certificate of Compliance)

Amend Section 29.06
Title 14, California Code of Regulations
Re: Recreational Sea Urchin Bag Limit Exemption

I. Date of Initial Statement of Reasons: September 24, 2020

II. Dates and Locations of Scheduled Hearings

(a) Notice Hearing

Date: August 19, 2020 Location: Teleconference

(b) Discussion Hearing

Date: October 14, 2020 Location: Teleconference

(c) Adoption Hearing

Date: December 9, 2020 Location: Teleconference

III. Description of Regulatory Action

(a) Statement of Specific Purpose of Regulatory Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary

Unless otherwise specified, all section references in this document are to Title 14 of the California Code of Regulations (CCR).

The kelp assemblage along the Northern and Central California Coast has seen a sharp decline in recent years. Bull kelp (*Nereocystis luetkeana*) in Northern California has declined by more than 90% of its historical level since 2014 (Rogers-Bennett and Catton 2019). This decline has been linked to a combination of severe warm water events and an explosive increase of herbivorous sea urchins, particularly purple sea urchins (*Strongylocentrotus purpuratus*). Purple sea urchins are a native species in California; however, the species' abundance is 60 times higher than historic levels, in part due to the loss of predatory sunflower sea star (*Pycnopodia helianthoides*) from wasting disease (Harvell et al. 2019) and a large purple sea urchin recruitment event. This has led to the overgrazing and suppression of bull kelp forests on the North Coast, and a regime shift from kelp forests to urchin barrens across most of the region (Rogers-Bennett and Catton 2019).

The collapse of the kelp forests has had catastrophic cascading effects on industries that rely on the kelp forest ecosystem, such as the commercial urchin roe fishery (i.e., marketable for culinary consumption of both the male and female gonads). The physiology of sea urchins

makes them extremely resilient to death by starvation. At the same time, the lack of food places all sea urchins, including red sea urchins (*Strongylocentrotus franciscanus*) perpetually in a starved state in which they do not develop healthy gonads (Claisse et al. 2013). The lack of quality/healthy gonads makes most of the RSUs found on the North Coast unmarketable. Despite being a historically important and lucrative fishery, the RSU fishery in Northern California collapsed in 2015 prompting a federal disaster declaration (Newsom G. 2019). In addition, abundance of other grazers and predators relying on kelp for food have decreased rapidly. As a result, the recreational red abalone fishery, one of the most iconic fisheries in California, was forced to close in 2018 (Commission 2018a).

The severe kelp decline is further compounded by the annual life cycle of bull kelp, the dominant canopy species in Northern California (Springer et al. 2010). Since plants die off each year, its abundance in any given year depends heavily on the abundance of the previous year. The severely diminished spore bank thus significantly limits the capacity for broadscale recovery of the species.

In response to the declining health of the kelp forests, the Fish and Game Commission (Commission) and the Department began to consider leveraging recreational divers to help control sea urchin populations. Based on strong public support, the Commission adopted an emergency regulation in April 2018 that temporarily increased the recreational take limit of purple sea urchins in Mendocino and Sonoma County. Due to concerns over accidentally triggering spawning events and potential habitat degradations, divers were required to bring urchins back to shore. In February 2019, the Commission increased the recreational urchin limit through a standard rulemaking and expanded the higher limit to Humboldt county as well (Commission 2018b). The expected recreational effort, however, did not materialize. Following several high-profile restoration events, dive effort tapered off due to the logistical constraints of bringing large quantities of purple sea urchins back to shore.

Since the adoption of the higher purple sea urchins bag limit in the North Coast, the environmental conditions in Northern California continue to deteriorate. Recent satellite data show that the decline of kelp canopy coverage has continued well into 2019 (Figure 1). Aerial drone surveys conducted by the Nature Conservancy across 25 representative sites in Mendocino and Sonoma Counties also show a continued decline of kelp in the region (Figure 2).

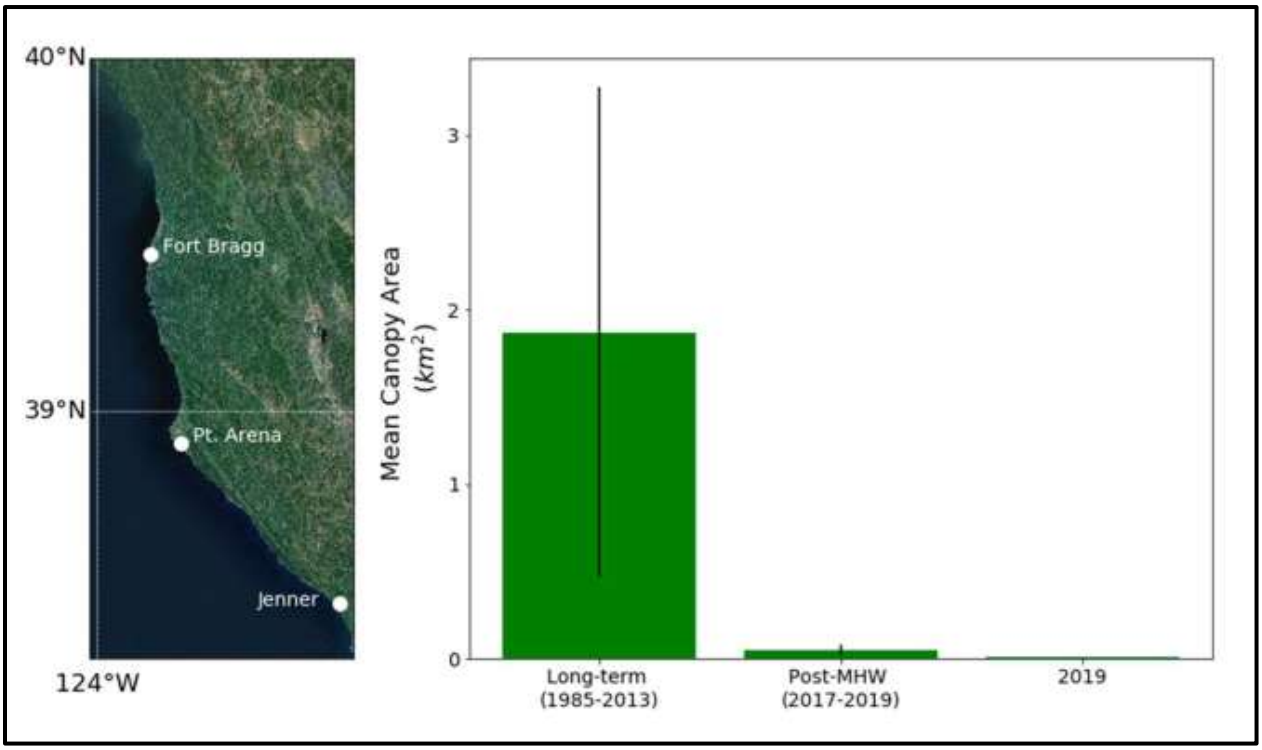

Figure 1. Mean Bull Kelp Coverage in Northern California in km^2 before Marine Heat Wave (MHW), after MHW, and in 2019 (Source: McPherson et al., 2020).

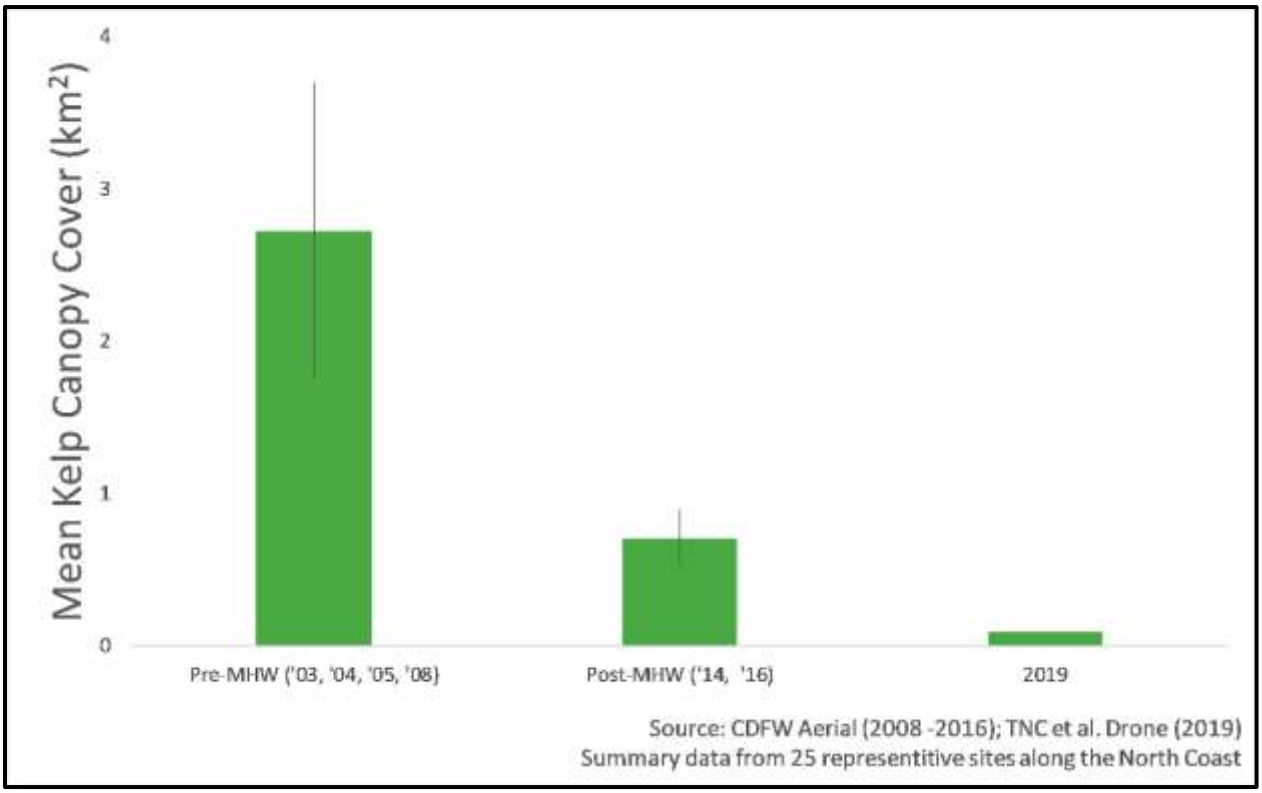

Figure 2. Bull Kelp Canopy Coverage developed from representative sites centered around Sonoma County coastline using aerial drones (Source: TNC 2019)

Towards the end of 2019, in response to further stakeholder input and worsening environmental conditions, the Department began to explore the feasibility of *in situ* take of sea urchins targeting a localized area. That strategy has shown limited potential elsewhere when removal is performed intensively, allowing for localized regeneration of kelp (Sanderson et al 2016). The density of sea urchins in a healthy kelp forest in Northern California is generally less than 2 individuals per m^2 (Rogers-Bennett and Catton 2019). Recently published research papers suggest that such density level is primarily kept in check by sustained and intense top-down predation pressure (Ling et al. 2019; Eisaguirre et al. 2020). If a high level of mortality can be applied to sea urchins in a small, semi-enclosed area, enough kelp stands may develop to reseed the surrounding area to facilitate the return of natural predators when ocean conditions are again favorable to kelp growth.

The Commission and Department selected Caspar Cove, Mendocino as the first test site at the end of 2019. The site is a semi-enclosed cove that delineates a naturally distinct geographical area. The areas outside the cove contained isolated stands of bull kelp occupying frequently disturbed formations that are difficult for sea urchins to access or recruit to. The area is located in the center of the urchin barren outbreak, small enough to attain an effective level of culling, and can be safely accessed by recreational divers through Caspar State Beach.

The Commission adopted an emergency regulation allowing unlimited purple sea urchin take inside Caspar Cove by recreational divers on February 21, 2020 due to concerns over the loss of the remaining kelp stands. The Department, Reef Check California, and volunteer divers were prepared to begin data collection on the planned urchin removal, and a dedicated online tool was developed to allow divers to enter the results of their dives and for Department staff to access data for analysis. However, the advent of COVID-19 pandemic significantly constrained the recreational diver community's participation in the Caspar Cove urchin control experiment, and work to date has been inadequate to assess the effectiveness of this method to help protect and restore kelp. As of August 12, 2020, only 19 dives have been conducted, with an estimated removal of 14,417 urchins. This lower than anticipated level of effort on a continuing basis is unlikely to result in meaningful kelp recovery in Caspar Cove.

In April 2020, the Commission received a request to implement a similar project at Tanker Reef in Monterey County (Commission Petition 2020-001). The Department originally intended to evaluate the efficacy of *in situ* urchin control only at Caspar Cove before potential broader application of the method. However, working with its partners at the Ocean Protection Council (OPC) and the Monterey Bay National Marine Sanctuary (MBNMS), the Department determined there was merit in also evaluating the efficacy of community-led *in situ* urchin control methods at Tanker Reef on the Central Coast. In collaboration with OPC, MBNMS, and the petitioner, a framework was developed whereby the petitioner will handle the bulk of experimental design, execution, and monitoring (Gold et al. 2020). Other partners, including the Department would provide the necessary support. This site represents a different biogeographic region dominated by Giant Kelp (*Macrocystis pyrifera*) rather than Bull Kelp, and has a higher degree of recreational diver accessibility than Caspar Cove, thereby enabling a more comprehensive evaluation of *in situ* urchin control under a broader suite of conditions.

Current Standard Regulations and Development of Emergency Regulations

Currently, under Section 29.06, recreational red sea urchins and purple sea urchins are subject to a daily bag limit of 35 animals per individual per day (subsection (a)). Under subsection (b), an individual can take up to 40 gallons of purple sea urchins when diving off the coast of Humboldt, Mendocino, and Sonoma Counties. Under subsection (c), retention of purple sea urchin, is not subject to any possession limit to ensure that individuals can collect and utilize large number of purple sea urchins taken under the higher daily bag limit in those three counties.

On March 9, 2020, the Commission filed an emergency rule adding subsection (d) to allow unlimited recreational take of purple sea urchin by hand or hand-held tools specifically inside Caspar Cove, Mendocino County with the Office of Administrative Law (OAL File 2020-0309-02E). The rule came into effect on March 17, 2020. Through Executive Orders N040-20 and N66-20, this action is extended through January 9, 2021. An additional extension is planned. On August 19, 2020, the Commission approved to go to Notice this ISOR initiating a certificate of compliance rulemaking to make standard the March 2020 emergency regulation, with some adjustments, as discussed below.

Proposed Amendment

This regulatory proposal would amend Section 29.06 to adopt the current emergency rule for Caspar Cove under subsection (d) as a standard rule. The proposal would also similarly create an exemption on recreational bag limit for sea urchin at Tanker Reef, Monterey.

The main goal of this proposal is to gather data and help inform whether recreational diver community-led *in situ* urchin control can support kelp restoration at key locations through promoting natural recovery. The Department also hopes that a successful restoration effort may directly confer ecological benefits to both Caspar Cove and Tanker Reef, such as allowing abalone to re-colonize areas previously impacted by urchin barrens.

Amend Subsections 29.06 (a): Default Daily Sea Urchin Bag Limit

The regulation will add a clarification to subsection (a) stating that the default daily bag limit of any sea urchin species is 35 individuals, consistent with the default bag limit for many marine invertebrates stated in subsection 29.05(a). Similarly, the name of Section 29.06 is also proposed for revision to remove the word “purple” to allow the section to apply to purple sea urchin, red sea urchin, or any other urchin species with respect to the 35 individual bag limit per species. This amendment is necessary for clarity purposes. In removing the specificity of “purple” to just “sea urchin,” the revision to subsection 29.06(a) removes the recreational bag limit for red sea urchin to accommodate the exemption from a take limit for red sea urchin for Tanker Reef, Monterey under subsection 29.06(d)(2).This change also clarifies that the bag limit for the purple sea urchin elsewhere in the state, and sea urchins generally, is still the default invertebrate daily bag limit of 35 individuals, except as provided in Section 29.06. While this subsection does not change the legal effect of subsection 29.05 (a), which already states

that the default recreational bag limit for marine invertebrates is 35 individuals per day, the statement clarifies it in light of the changes to that bag limit in Section 29.06.

Add Subsection 20.06 (d): Sea Urchin Bag Limit Exemption

The addition of subsection (d) adds the bag limit exemption for sea urchins in two specific locations. Subsection (d)(1) will maintain the existing exemption on take granted by emergency action under 2020-0309-02E for Caspar Cove. Proposed subsection (d)(2) will provide the exemption for Tanker Reef. Subsection (d) will start with the statement "[n]otwithstanding other parts of this Section." This is necessary to clarify that the exemptions only apply to the two areas and only under the specific terms of the subsections.

Subsection (d) also provides for a sunset date of April 1, 2024 for both location exemptions. The sunset date is necessary to demonstrate that the removal efforts represent an experimental study, and for accountability and the integrity of the state's management. On April 1, 2024, the proposed rule would have been in effect for 3 years. Because a Commission rulemaking process concerning recreational fishing can take up to almost an entire year, the proposed time period would give the state at least two years of data before a new round of rulemaking is considered. This is the minimum amount of time needed to observe a potential trend in environmental conditions. The experimental nature of this proposal necessitates the shortest period necessary, and a longer timeframe is thus not proposed.

Add Subsection 20.06 (d)(1): Purple Sea Urchin Bag Limit Exemption in Caspar Cove

This proposal would adopt the current emergency rule, subsection (d), as a standard rule as subsection (d)(1). The location of Caspar Cove was originally chosen for experimental urchin removal efforts due to its density of purple sea urchins, size, and ease of access for divers. The advent of the COVID-19 pandemic has greatly diminished the short-term prospect of restoring kelp in the cove. Nonetheless, the Department supports the continuation of removals at this location. The Department hopes that dive effort will return, and enough bull kelp stands will persist in the surrounding area to help reseed the cove to inform future management in other areas of the North Coast.

As is with the current emergency rule, only purple sea urchins may be taken in unlimited number. The area is an established fishing ground for the commercial red sea urchin (Figure 3). The Department determined that allowing taking of red sea urchin in Caspar Cove would be inequitable at this time given the recent fishery collapse and federal disaster declaration. This is necessary to preserve the trust and equitable treatment of the commercial red sea urchin fishery.

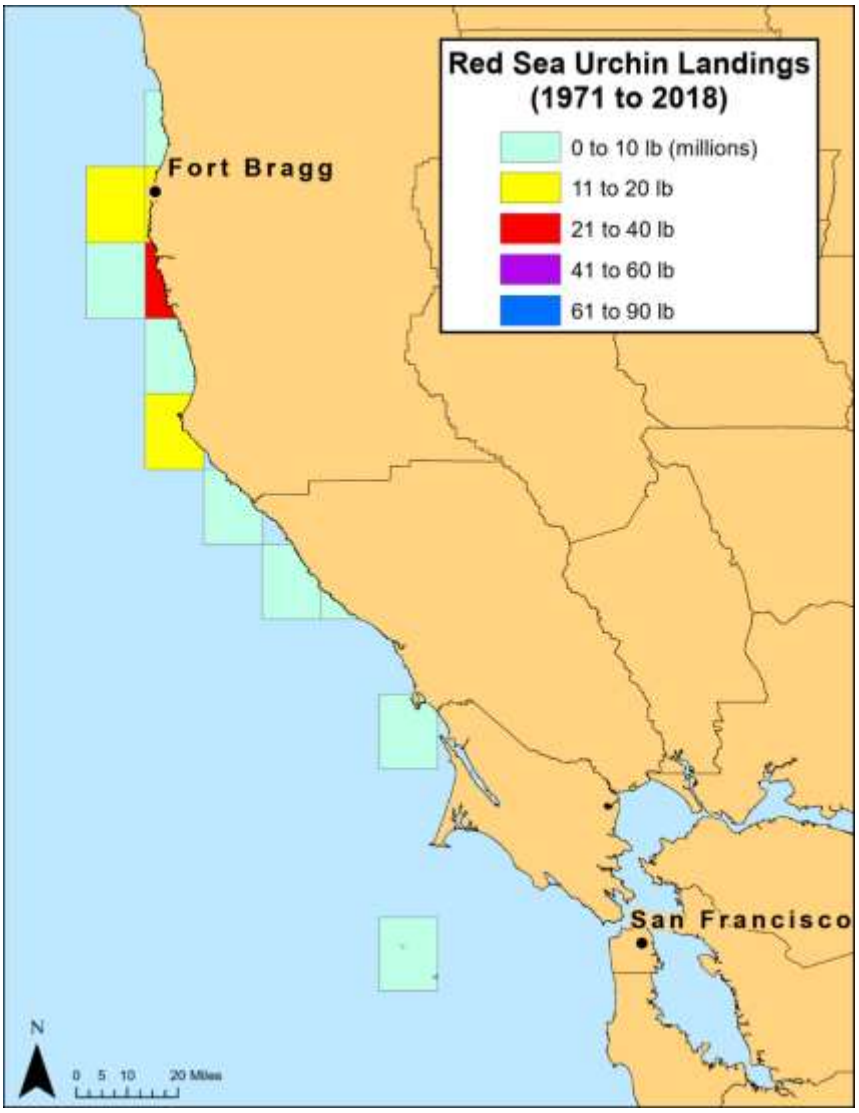

Figure 3. Locations and historical red sea urchin landings in Northern California from 1971 to 2018 (Source: CDFW MLDS 2019).

The proposed regulations would also restrict the daily bag limit exemption to only recreational take by hand or hand-held tools. This is necessary to restrict disturbance to the underlying reef structure. As noted in previous rulemaking packages, the Commission and Department believe that restoration efforts must minimize environmental impact. By restricting take to only hand and hand-held tools, risk of significant environmental impact can be avoided.

Add Subsection 20.06 (d)(2): Sea Urchin Bag Limit Exemption at Tanker Reef.

This proposal would add an additional experimental site at Tanker Reef, Monterey and allow daily bag limit exemption of both red sea urchin and purple sea urchin. In addition to its proximity to a large diver population, the Tanker Reef location offers an opportunity for the Department to examine how sea urchin populations can be controlled in a very different setting compared to Caspar Cove. Unlike the North Coast, kelp abundance is diminished in the Monterey area, but the area is not saturated with urchin barrens. The type of kelp that forms

the canopy in this region, giant kelp, are perennial and could potentially respond very differently to urchin removal.

In addition, the Tanker Reef location also allows the Department to examine the effect of culling both red sea urchin and purple sea urchin in an area without commercial activities. Between 2000 and 2020, approximately 6,500 lbs of red sea urchin were taken commercially in the Central Coast area, all of which were landed in Santa Cruz or further north.

The proposed boundary for the Tanker Reef urchin removal site is described below in Figure 4. The western boundary has been angled eastward from that proposed by the petitioner in Petition 2020-001. This is necessary to avoid an established private anchorage (Figure 5). The eastern boundary of the proposed area has been extended further eastward in order to cover the entire reef. This is necessary to ensure that the result of the experiment is not affected by the confounding effect of sea urchins migrating in from any part of the reef not covered by the bag limit exemption. This change also alleviates the need for enforcement officers to determine whether divers at Tanker Reef are inside or outside the delineated boundary. The specific starting points for the eastern and western boundaries are selected because of their clear delineation by the Monterey Tides resort and the parking lot at the end of Camino El Estero, respectively. Lastly, the seaward boundary is extended to 20m to ensure that the exemption will cover the depth range of kelp and all dive activities.

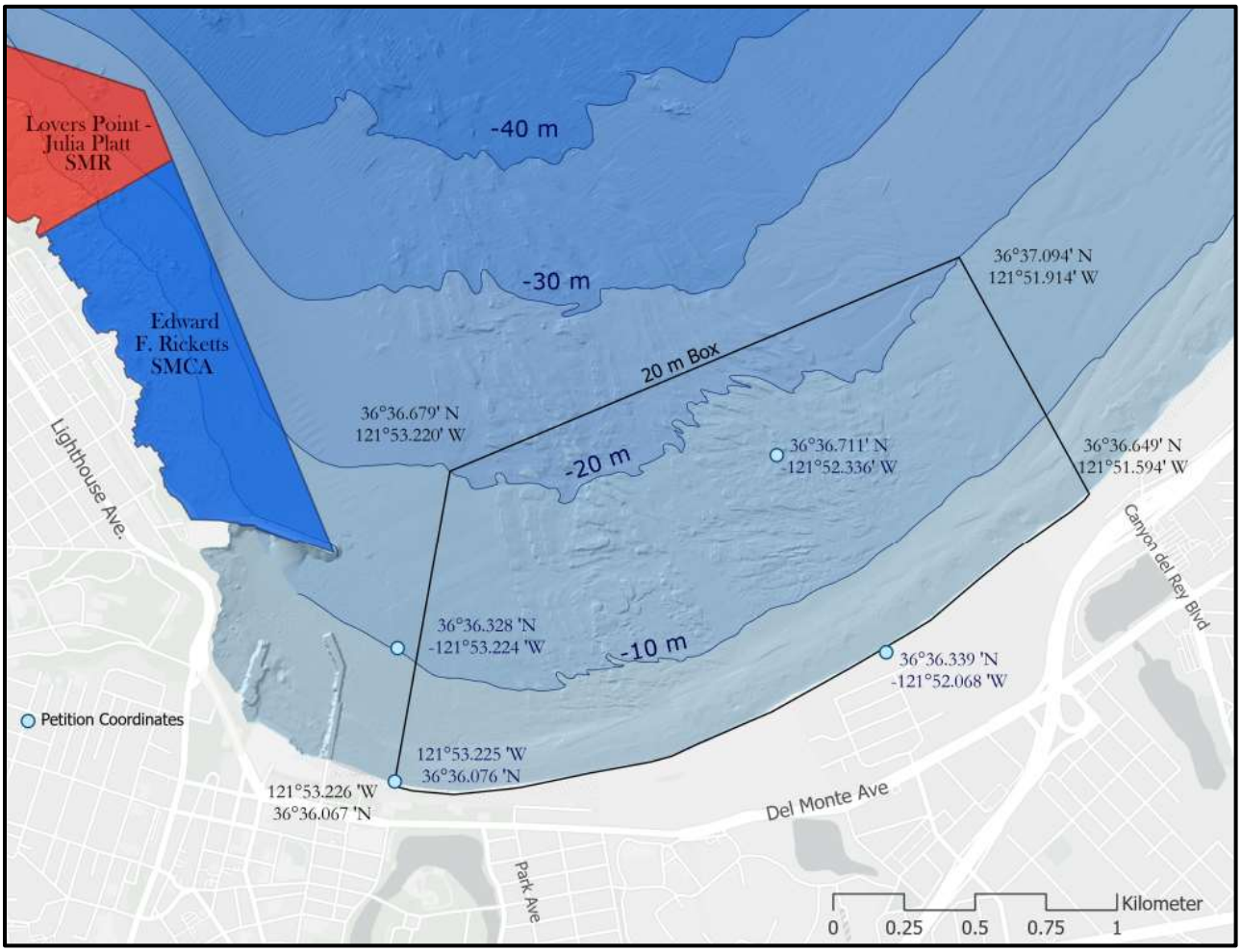

Figure 4. Proposed boundary for Tanker Reef urchin removal site, including proposed boundary in Commission Petition 2020-001.

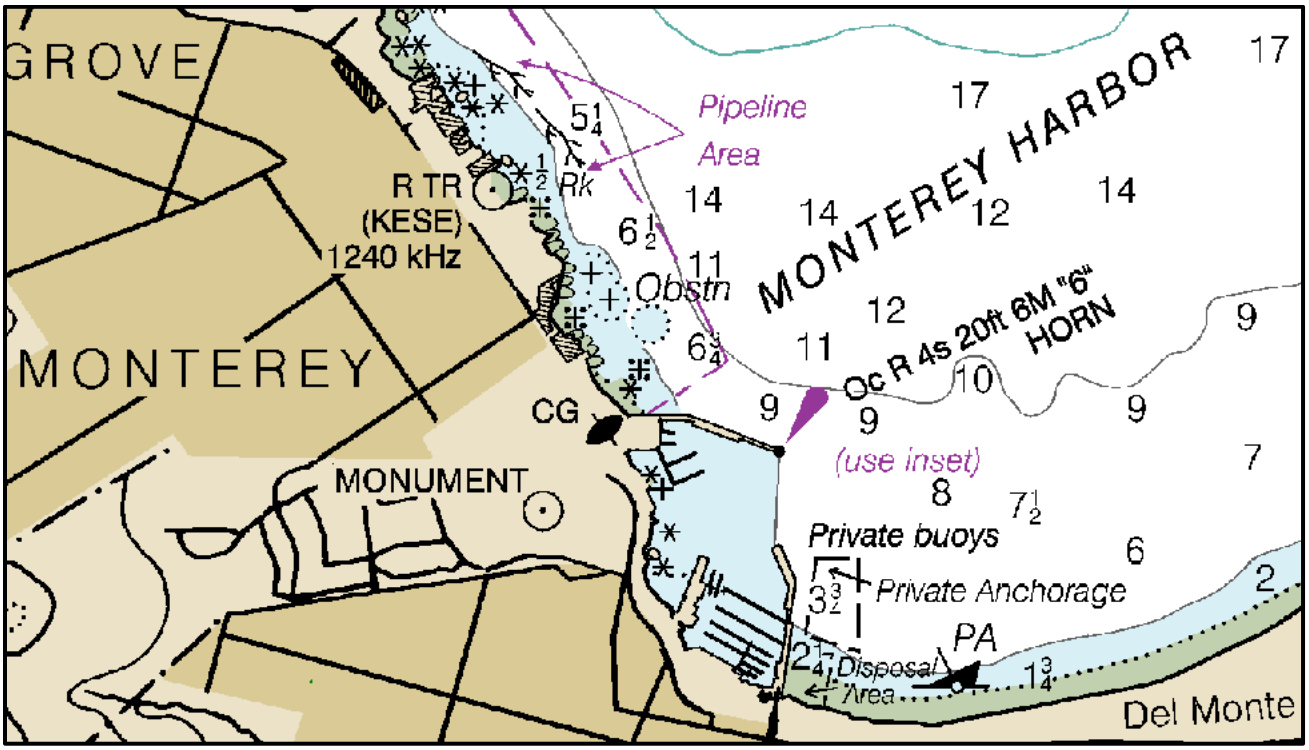

Figure 5. Close-up snapshot of eastern Monterey of NOAA navigational chart 18685 showing existing private anchorage in front of the Monterey Municipal Beach.

Consistent with the emergency rule for Caspar Cove, harvest of recreational sea urchin at Tanker Reef will be limited to take by hand or hand-held tools. This is borne out of the necessity of protecting the physical environment for the same reason as those described above for Caspar Cove.

(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 primary goal of this proposal is to make permanent an existing exemption on sea urchin take limits in Caspar Cove, Mendocino, and add a second test site at Tanker Reef in Monterey to test the effectiveness of kelp restoration through sea urchin removal by recreational divers. The result from the test sites will help inform future kelp restoration projects. The proposal can also potentially create kelp refuges that can directly contribute to the overall statewide kelp restoration effort.

(c) Authority and Reference Sections from Fish and Game Code for Regulation

Authority: Sections 200 and 205 Fish and Game Code

Reference: Sections 200 and 205 Fish and Game Code

(d) Specific Technology or Equipment Required by Regulatory Change

None

(e) Identification of Reports or Documents Supporting Regulation Change

Eisaguirre, J. H., Eisaguirre, J. M., Davis, K., Carlson, P. M., Gaines, S. D., & Caselle, J. E. (2020). Trophic redundancy and predator size class structure drive differences in kelp forest ecosystem dynamics. *Ecology*, *101*(5), e02993. Available from: https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/ecy.2993.

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Ling, S. D., Scheibling, R. E., Rassweiler, A., Johnson, C. R., Shears, N., Connell, S. D., ... & Clemente, S. (2015). Global regime shift dynamics of catastrophic sea urchin overgrazing. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *370*(1659), 20130269. Available from: https://royalsocietypublishing.org/doi/pdf/10.1098/rstb.2013.0269.

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(f) Identification of Reports or Documents Providing Background Information

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Fish and Game Commission. (2018a). Initial Statement of Reasons for Regulatory Action to Amend Section 29.15, Title 14, California Code of Regulations, Re: Abalone Regulations. http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=160847&inline.

Gold, M., Shuman, C., Michel, P., Joint Agency Comments Re: Proposed Amendments to Recreational Sea Urchin Regulations at Tanker Reef, Monterey County. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=182105&inline.

Harvell, C. D., Montecino-Latorre, D., Caldwell, J. M., Burt, J. M., Bosley, K., Keller, A., ... & Pattengill-Semmens, C. (2019). Disease epidemic and a marine heat wave are associated with the continental-scale collapse of a pivotal predator (Pycnopodia helianthoides). *Science advances*, *5*(1), eaau7042. https://advances.sciencemag.org/content/advances/5/1/eaau7042.full.pdf.

McPherson, Finger, Housekeeper, Bell, Carr, Rogers-Bennett, & Kudela. (2020). Paper Under Review (Analyzes kelp coverage data gathered from Northern California from 1985-2019).

The Nature Conservancy. (2019) Summary Data from 25 Representative Sites along the North Coast.

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(g) Public Discussions of Proposed Regulations Prior to Notice Publication

The poor conditions of the Northern and Central California kelp forests are well-known, and have been discussed extensively in previous rulemakings. The subject has been discussed frequently since 2015 at various Commission meetings, primarily in meetings where the subjects of sea urchin fishing and abalone fishing were on the agenda or otherwise mentioned.

Portion of this rulemaking was developed directly in response to Commission public petition 2020-001 as submitted during the January 2020 Commission meeting and discussed at the June 2020 and August 2020 Commission meetings. As described in Gold et al. 2020, this proposal is the result of months of discussion between the state, the petitioner, and various partner organizations.

IV. Description of Reasonable Alternatives to Regulatory Action

(a) Alternatives to Regulation Change

- Tanker Reef – Do not include red sea urchin in proposed subsection 29.06(d)(2) regarding unlimited take at Tanker Reef.

  The Department considered only authorizing purple sea urchin take at Tanker Reef, consistent with the provisions for Caspar Cove in subsection 29.06 (d)(1), as purple sea urchin is the species causing excessive overgrazing, and Calfornia has an active commercial red sea urchin fishery. However, recent studies suggest that even if all

purple sea urchin are removed, that red sea urchin alone still would have the potential to overgrazing a reef, which could undermine the restoration effort as intended. As the Department has determined that there is no commercial red sea urchin in the area and thus would be low risk of impact to the commercial fishery; and due to the temporary nature of the proposal established through inclusion of the sunset date, this proposal was rejected in the interest of effectively testing urchin removals for kelp recovery at Tanker Reef.

- Add a third geographic location to subsection 29.06(d) in Monterey County within a marine protected area (MPA)

  The state also considered allowing recreational culling inside MPAs as a result of queries and comments made public meetings, but ultimately declined to do so in the immediate future. The state has serious concerns over the impact that large-scale culling by recreational divers may have on other living resources inside MPAs, which are protected by separate regulations in Section 632. This would require amending regulations in Section 632, would result in increased enforcement burdens, and would be inconsistent with state policy regarding take in MPAs to date. Information gathering inside nearby MPAs will be accomplished through small-scale research activities conducted by California Reef Check under the tighter control and oversight of a scientific collecting permit issued by the Department rather than unlimited recreational take without the same controls.

(b) No Change Alternative

Without the proposed regulatory change, the state will not be able to test the prospect of restoring kelp forests through recreational dive effort.

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 proposed regulatory action will extend and expand an existing kelp habitat restoration effort that will help to support and a variety of recreational sportfishing opportunities. The restoration of kelp forests is vital to the revitalization of the declining abalone sport fishery and to an array of species that benefit from the kelp forest ecosystem.

The proposed action will have no adverse impact to recreational opportunities or to species of value for commercial fisheries.

(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 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; 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 long-term sustainability and quality of the kelp forest ecosystem in Central and Northern California, as well as the coastal economy that relies on it. Small increases in recreational urchin diving opportunities may result in an increase in visits to the affected areas that will bring some additional local expenditures to businesses that support ocean diving activities. However, the increase in visits are not likely to be substantial enough to spur the creation of new jobs, new businesses, or the expansion of businesses.

(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 change in administration or enforcement costs are anticipated by CDFW or other State agencies. Consideration was given to keep administrative and enforcement costs within existing budgets. No impact in federal funding to the State is anticipated.

(e) Nondiscretionary Costs/Savings to Local Agencies

None. The proposed action has been designed to ensure that there are no nondiscretionary cost impacts to local law enforcement or emergency response services.

(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 primary aim of the proposed action is to make permanent an existing exemption on sea urchin recreational take limits in Caspar Cove, Mendocino, and to add a second experimental test site at Tanker Reef in Monterey to test the effectiveness of kelp restoration through sea urchin removal by recreational divers. The result from the test sites will help inform future kelp restoration projects. The proposal is also intended to help to ensure the long-term sustainability and quality of the kelp forest ecosystem in Central and Northern California, as well as the coastal economies that rely on productive kelp forest ecosystems.

The Commission anticipates no impacts on the creation of jobs, businesses or the elimination of existing businesses within the state because the proposed action is for increased recreational sea urchin take that his not likely to involve a substantial consistent increase in diver numbers or spending. Some urchin removal events have been organized in Northern California and may continue to occur, however the continuation of organized dive events and turnout numbers are not entirely predictable, given current COVID-19 closures in some areas as well as a multitude of other unknown intervening factors that could affect turnout.

Some small positive economic impacts to businesses that serve ocean divers and other visitors drawn to the vicinity to provide shore support are anticipated. Based on the purple sea urchins removal events in Northern California in 2019 and early 2020, between 30 to 100 people may participate in each organized urchin removal event, as well as and smaller group trips, in the Northern California location and at the new Tanker Reef location in Monterey County.

Expenditures on purchases or rentals of wetsuits, SCUBA tanks and oxygen refills, fuel, food, and accommodations are the some of the types of spending that may be increased due to this regulation change. The most common recreational methods used to take sea urchins are SCUBA and free-diving that may spur a small increase in local spending on diving equipment rentals and/or purchases. Additionally, these recreational urchin divers are often accompanied by shore support and other friends and family, who are also likely to spend locally on fuel, food, and for those who travel larger distances, also accommodations.

The proposed action also increases the recreational take of red sea urchins in Monterey County (Tanker Reef). Red sea urchins are a commercial target species, but historically red sea urchins have not been commercially landed in Monterey Area ports since a small landing in 2015 as shown in Table 1. Additionally, stressed RSU have reduced commercial value due to tissue deterioration. These two factors support the expectation of no adverse impact to commercial red sea urchin diving businesses.

Table 1. California Red Sea Urchin Pounds Landed by Port Area: 2014-2020

PORT AREA	2014	2015	2016	2017	2018	2019	2020 Jan-July	Area Total
Fort Bragg Area	3,598,497	1,272,085	546,495	461,011	215,114	49,248	75,449	6,217,899
Bodega Bay Area	92,237	111,570	583	1,570	8,136	1,040	1,099	216,235
San Francisco Area	13,068	10,739	14,835	23,542	11,704	6,506	6,738	87,132
Monterey Area	0	176	0	0	0	0	0	176
Eureka Area	186	3,737	0	0	0	0	0	3,923
NORTH TOTAL	**3,703,988**	**1,398,308**	**561,914**	**486,123**	**234,954**	**56,794**	**83,286**	6,525,365
Los Angeles Area	1,355,543	1,106,258	644,046	839,811	905,226	947,855	238,244	6,036,983
Morro Bay Area	1,481	1,919	0	359	658	0	0	4,417
Santa Barbara Area	6,932,102	5,517,715	4,473,453	2,782,120	1,981,761	1,027,377	518,939	23,233,466
San Diego Area	516,727	457,751	204,671	87,549	107,005	344,822	152,964	1,871,489
SOUTH TOTAL	**8,805,853**	**7,083,642**	**5,322,170**	**3,709,839**	**2,994,649**	**2,320,054**	**910,147**	31,146,355

Source: CDFW Marine Landings Database

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State

The Commission anticipates no impacts on the creation or elimination of jobs within the state because the proposed action is for increased recreational purple sea urchin take that is not likely to involve a substantial increase in diver visits or area expenditures. At recent Northern California removal events the most common dive methods used were SCUBA and free-diving that may spur a small increase in local spending on diving equipment rentals and/or purchases. The proposed action also increases the recreational possession of red sea urchins (in Tanker Reef). Red sea urchins are a commercially targeted species, but historically red sea urchins have not been regularly commercially landed in Monterey County, as shown in Table 1. Additionally, stressed red sea urchins, as occur in the urchin barrens, have reduced commercial value due to gonad tissue deterioration. These two factors support the expectation of no job impacts to the commercial red sea urchin fishery.

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State

The Commission anticipates no impacts on the creation new businesses or the elimination of existing businesses within the state because the proposed action is for increased recreational sea urchin take that is not likely to involve a substantial increase in the number of diver visits or area expenditures. The most common methods used are SCUBA diving and free-diving that may spur a small increase in local spending on diving equipment rentals and/or purchases. The proposed action increases the recreational take of red sea urchins (in Tanker Reef). Red sea urchins are a commercial target species, but historically red sea urchins have not been commercially landed in Monterey County, since a small quantity in 2015 (see Table 1.). Additionally, stressed red sea urchins reduces the commercial value of the harvest due to tissue deterioration. These two factors support the expectation of no impact to the commercial red sea urchin fishery and/or associated businesses.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State

The Commission anticipates no impacts on the expansion of businesses currently doing business within the state because the proposed action is for increased recreational purple sea urchins take that is not likely to involve a substantial increase in diver numbers or spending. The most common methods used are SCUBA diving and free-diving that may spur a small increase in local spending on diving equipment rentals and/or purchases. The proposed action also increases the recreational take of red sea urchins (in Tanker Reef). Red sea urchin are a commercial target species, but historically red sea urchins have not been commercially landed in Monterey County. Additionally, stressed red sea urchins reduces the commercial value of the harvest due to tissue deterioration. These two factors support the expectation of no impact to the commercial red sea urchin fishery and/or associated 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 with increased recreational sea urchin take and because the program is an effort to restore vital kelp forests that support diverse species and healthier marine ecosystems which many residents value and that may also benefit coastal economies.

(e) Benefits of the Regulation to Worker Safety

The Commission anticipates no impacts on the worker safety because the proposed action does not have any bearing on to working conditions.

(f) Benefits of the Regulation to the State's Environment

The Commission anticipates benefits to the State's environment by contributing to the restoration of vital kelp forest ecosystems.

Informative Digest/Policy Statement Overview

The Fish and Game Commission (Commission) and the Department of Fish and Wildlife (Department) are proposing to amend Section 29.06 of Title 14, California Code of Regulations (CCR). The proposed regulations would establish two areas for kelp restoration and information collection efforts aided by recreational divers. The proposal is the state's most recent attempt to help restore depleted and diminishing kelp forests in Central and Northern California following warmer than normal ocean conditions and the loss of predatory sea stars to wasting disease. Many former kelp forests are now urchin barrens, and new kelp stands cannot be reestablished due to overgrazing by sea urchins.

Best available studies suggest that sea urchin density can be controlled only if sufficient mortality can be incurred. This proposal puts forth Caspar Cove in Mendocino County and Tanker Reef in Monterey County as two sites where recreational divers will be able to test the feasibility of controlling sea urchin populations through recreational diving efforts. It is hoped that kelp refuges can be created at these sites and when ocean conditions are again favorable for kelp growth and return of natural predators, these areas can provide the necessary spore banks to reseed the coast.

Under the proposed regulations, recreational divers are allowed to take unlimited purple sea urchins in Caspar Cove and unlimited purple sea urchins and red sea urchins at Tanker Reef. Take of red sea urchin will not be allowed in Caspar Cove because of an active commercial red sea urchin fishery in the area. Take must be conducted by hand or with hand-held tools due to the risks that automated or pressurized machines pose to the hard substrate of the reefs. The primary purpose of the proposed regulations is to collect data and gather information; the regulations will sunset on April 1, 2024. Upon the expiration of the proposed regulations, the Commission and the Department will work to implement the next step of its adaptive management based on information gathered.

Benefits of the Regulations

The primary goal of this proposal is to test the effectiveness of kelp restoration through sea urchin control by recreational divers at two test sites. The results from the test sites will help inform future kelp restoration projects. The proposal can also potentially contribute to the overall statewide kelp restoration effort.

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 and 205); 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 29.06 is amended, as follows:

§ 29.06. ~~Purple~~ Sea Urchin.

(a) Except as provided in this section, the daily bag limit for ~~purple~~ sea urchin is 35 individuals for each species.

(b) The daily bag limit for purple sea urchin is forty (40) gallons when taken while skin or SCUBA diving in ocean waters of the following counties: Humboldt, Mendocino, and Sonoma.

(c) There is no possession limit for purple sea urchin.

(d) Notwithstanding other parts of this Section and until April 1, 2024:

> (1) In ocean waters seaward of Caspar Headlands State Beach commonly referred to as Caspar Cove, in Mendocino County, in the area eastward of a straight line connecting points between 39º 22.045' N. lat. 123º 49.462' W. long. and 39º 21.695' N. lat. 123º 49.423' W. long., purple sea urchins may be taken in any number for the purpose of restoring the kelp ecosystem. Purple sea urchins may only be taken by hand or with manually operated hand-held tools.
>
> (2) In ocean waters seaward of Fort Ord Dunes State Park commonly referred to as Tanker Reef, in Monterey County, in the area eastward of a straight line connecting points between 36° 36.076’ N. lat. 121° 53.225’ W. long. and 36° 36.679’ N. lat. 121° 53.220’ W. long., westward of a straight line connecting points between 36° 36.649’ N. lat. 121° 51.594’ W. long. and 36° 37.094 N. lat. 121° 51.914 W. long., and shoreward of a straight line connecting points between 36° 36.679’ N. lat. 121° 53.220’ W. long. and 36° 37.094’ N. lat. 121° 51.914’ W. long., red sea urchins and purple sea urchins may be taken in any number for the purpose of restoring the kelp ecosystem. Red sea urchins and purple sea urchins may only be taken by hand or with manually operated hand-held tools.

Note: Authority cited: Sections 200 and 205, Fish and Game Code.

Reference: Sections 200 and 205, Fish and Game Code.

STATE OF CALIFORNIA — DEPARTMENT OF FINANCE

ECONOMIC AND FISCAL IMPACT STATEMENT (REGULATIONS AND ORDERS)

STD. 399 (Rev. 10/2019)

ECONOMIC IMPACT STATEMENT

DEPARTMENT NAME	CONTACT PERSON	EMAIL ADDRESS	TELEPHONE NUMBER
Fish and Game Commission	Margaret.Duncan	@wildlife.ca.gov	916-704-3215

DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400	NOTICE FILE NUMBER
Amend Section 29.06, Title 14, CCR: Re: Recreational Sea Urchin Bag Limit Exemption	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:

- [x] a. Impacts business and/or employees
- [x] b. Impacts small businesses
- [ ] c. Impacts jobs or occupations
- [ ] d. Impacts California competitiveness
- [ ] e. Imposes reporting requirements
- [ ] f. Imposes prescriptive instead of performance
- [x] g. Impacts individuals
- [ ] 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 (Agency/Department) estimates that the economic impact of this regulation (which includes the fiscal impact) is:

- [x] 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: >300 indirectly

Describe the types of businesses (Include nonprofits): Ocean diving eqt. rental and supporting services may have increases in business

Enter the number or percentage of total businesses impacted that are small businesses: 80%

4. Enter the number of businesses that will be created: 0 eliminated: 0

Explain: This regulation increases the bag and possession limit for an existing recreational fishery

5. Indicate the geographic extent of impacts:
- [ ] Statewide
- [x] Local or regional (List areas): Mendocino and Monterey Counties

6. Enter the number of jobs created: 0 and eliminated: 0

Describe the types of jobs or occupations impacted: n/a

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 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*

   a. Initial costs for a small business: $ 0 Annual ongoing costs: $ 0 Years: 3**

   b. Initial costs for a typical business: $ 0 Annual ongoing costs: $ 0 Years: 3**

   c. Initial costs for an individual: $ Annual ongoing costs: $ Years: 3**

   d. Describe other economic costs that may occur: *No costs impacts incurred for compliance. See Addendum

   ** Regulation is proposed to sunset April 1, 2024, three years after the effective date.

2. If multiple industries are impacted, enter the share of total costs for each industry: n/a

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.* $ n/a

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: Critical kelp habitat destruction is within State waters.

   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: Health and welfare of CA residents may benefit from increased recreational take of sea urchin. Worker safety not affected. Benefits to the State's environment are anticipated through the restoration of kelp forest habitats to foster and support a diverse balance of species.

2. Are the benefits the result of: ☐ specific statutory requirements, or ☒ goals developed by the agency based on broad statutory authority?

   Explain: FGC code section 200 provides the "Commission's Power to Regulate Taking of Fish and Game"

3. What are the total statewide benefits from this regulation over its lifetime? $ difficult to monetize

4. Briefly describe any expansion of businesses currently doing business within the State of California that would result from this regulation: No impact on the expansion of businesses is anticipated.
   Some dive shops may have some increase in business, but since small numbers of new divers expected, no expansion.

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:

   1) Only allow take of Purple Sea Urchin at Tanker Reef (no Red Sea Urchin); 2) Expanded Tanker Reef western boundary.

   See Addendum for details.

ECONOMIC IMPACT STATEMENT (CONTINUED)

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered:

Regulation:	Benefit: $ *	Cost: $ 0
Alternative 1:	Benefit: $ < proposed	Cost: $ 0
Alternative 2:	Benefit: $ < proposed	Cost: $ 0

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives: *Difficult to monetize benefits of possible habitat restoration that may or may not be successful will be influenced by unknown contingencies.

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: Management of sea urchins affect on kelp forest restoration is more readily implemented and enforced with prescriptive regulations.

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 through12 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: Proposed regulation will not impact investment incentives in the State.

The incentive for innovation in products, materials or processes: Proposed regulation will not provide incentives 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: Benefits to the State's environment with the restoration of kelp forest habitats that foster and support a diverse balance of species.

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 Increases in diver visits may result in small increases in local sales tax (estimated $6,250); and in TOT tax (estimated $20,000) received by governments in the affected coastal areas, but also to other areas enroute.

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 Increases in diver visits may result in small increases in state sales tax (estimated $36,250). CDFW may have a small increase in sportfishing license sales (estimated $51,020).

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
Farrell, Dennis@Wildlife Digitally signed by Farrell, Dennis@Wildlife DN: DC=Gov, DC=Ca, DC=Dfg, DC=AD, OU=DFG Divisions, OU=AD, OU=Users, CN="Farrell, Dennis@Wildlife" Reason: I am approving this document Location: your signing location here Date: 2020-10-02 08:50:18 Foxit PhantomPDF Version: 9.6.0	October 2, 2020

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
Melissa A. Miller-Henson	10/2/20

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

STD399 CALCULATIONS WORKSHEET
ADDENDUM

Amend Section 29.06
Title 14, California Code of Regulations
Re: Recreational Sea Urchin Bag Limit Exemption

Economic Impact Statement

The primary aim of the proposed action is to make permanent an existing exemption on sea urchin recreational take limits in Caspar Cove, Mendocino County, for testing purposes, and to add a second urchin removal test site at Tanker Reef in Monterey County to test the effectiveness of kelp restoration through sea urchin removal by recreational divers. The result from the test sites will help inform future kelp restoration projects. The proposed action is also intended to help ensure the long-term sustainability and quality of the kelp forest ecosystem in central and northern California, as well as the coastal economies that rely on productive kelp forest ecosystems.

As of the end of 2019, both recreational red sea urchin and purple sea urchin take are subject to a daily bag limit of 35 animals per individual per day. Retention of purple sea urchin, however, is not subject to any possession limit. Furthermore, an individual can take up to 40 gallons of purple sea urchin when diving off the coast of Humboldt, Mendocino, and Sonoma Counties. This regulatory proposal would amend section 29.06 to adopt the current emergency rule for Caspar Cove under subsection (d) as a standard (permanent) rule. The proposal would also similarly exempt a take limit for recreational sea urchins by divers at Tanker Reef, Monterey from the recreational bag limit for invertebrates (section 29.05). The Tanker Reef area in Monterey County is located right in the center of an urchin barren and is small enough that an effective level of culling might be attained, and the area can be safely accessed by recreational divers.

There is potential for some positive economic impacts to businesses that serve ocean divers and other visitors drawn to the vicinity to provide shore support. The participation level in a few purple sea urchin removal events in northern California in 2019 suggests that between 30 to 100 people may come out per organized removal event to participate in urchin removal at the northern California locations and at the new Tanker Reef location in Monterey County. However, the continuation of organized dive events and turnout numbers are not entirely predictable, given current Covid-19 closures in some areas, local ordinances for public safety, as well as a multitude of other unknown intervening factors that could affect turnout.

Smaller, more remote areas where the sea urchin dive areas are located generally have much smaller multipliers for total economic impact because spending “leaks” out of the area as businesses and individuals purchase inputs that are not produced locally. The impact of the proposed regulations on the total economic output figures is expected to cause no decline, no change, or possibly a small increase.

The proposed action increases the recreational take of red sea urchin. Red sea urchins are a commercial target species, but red sea urchin have not been commercially landed in Monterey area ports since a small landing in 2015, as shown in Table 1. *California Red Sea Urchin Pounds Landed by Port Area: 2014-2020*. Additionally, stressed red

sea urchin (as have been observed in Tanker Reef) have reduced commercial value due to tissue deterioration. These two factors support the expectation of no adverse impact to the commercial red sea urchin fishery.

Table 1. California Red Sea Urchin Pounds Landed by Port Area: 2014-2020

PORT AREA	2014	2015	2016	2017	2018	2019	2020 Jan-July	Area Total
Fort Bragg Area	3,598,497	1,272,085	546,495	461,011	215,114	49,248	75,449	6,217,899
Bodega Bay Area	92,237	111,570	583	1,570	8,136	1,040	1,099	216,235
San Francisco Area	13,068	10,739	14,835	23,542	11,704	6,506	6,738	87,132
Monterey Area	0	176	0	0	0	0	0	176
Eureka Area	186	3,737	0	0	0	0	0	3,923
NORTH TOTAL	**3,703,988**	**1,398,308**	**561,914**	**486,123**	**234,954**	**56,794**	**83,286**	6,525,365
Los Angeles Area	1,355,543	1,106,258	644,046	839,811	905,226	947,855	238,244	6,036,983
Morro Bay Area	1,481	1,919	0	359	658	0	0	4,417
Santa Barbara Area	6,932,102	5,517,715	4,473,453	2,782,120	1,981,761	1,027,377	518,939	23,233,466
San Diego Area	516,727	457,751	204,671	87,549	107,005	344,822	152,964	1,871,489
SOUTH TOTAL	**8,805,853**	**7,083,642**	**5,322,170**	**3,709,839**	**2,994,649**	**2,320,054**	**910,147**	31,146,355

Source: California Department of Fish and Wildlife Marine Landings Database

Directly Affected Parties

The proposed regulations directly affect an unknown number of recreational urchin divers or other individuals interested in helping to restore kelp forest habitats.

Indirectly-Affected Parties

Businesses that support sport fishing activities would be indirectly affected through any changes in diver spending for goods and services en route to and within various fishery locales. Such businesses include diving and fishing equipment and supply stores, motels, campgrounds, restaurants, convenience and grocery stores, and fuel stations. These types of businesses fall into the North American Industrial Classification Code System (NAICS) codes for Retail, Food and Accommodations, and Hunting and Fishing. Many (~80%) may be small businesses per California Government Code Article 2, Section 11342.610.

Explanation of Responses in Std. 399

Section A. Estimated Private Sector Cost Impacts

1. The proposed rulemaking introduces no new costs that a representative private person or business would incur in compliance with the proposed regulations. Other. discretionary costs may involve expenditures on purchases or rentals of wetsuits, SCUBA tanks and oxygen refills, fuel, food, and accommodations as some of the types of spending that may be increased due to the proposed regulation change. The most

common methods used are SCUBA diving and free-diving, which may spur a small increase in local spending on diving equipment rentals and/or purchases. Additionally, recreational urchin divers are often accompanied by shore support and other friends and family, who are also likely to spend locally on fuel, food, and also accommodations for those who travel larger distances.

2. The Commission estimates that the economic and fiscal impact of this regulation is well below $10 million. For there to be a $10 million change in direct expenditures, there would have to be approximately 100,000 more diver visits per year. The experience from northern California urchin removal areas does not support an expectation of that level of additional turnout.

3. The total number of businesses indirectly impacted is difficult to specify because the proposed regulations apply specifically to individuals who may choose to recreationally dive for sea urchins. Those individuals may then engage various sportfish and travel-related businesses for goods and services; in that way, businesses are indirectly impacted by the regulation to the extent that the regulation alters diver spending choices. If one considers only some of the business establishments identified that support sport fishing (fishing equipment and supply stores; hotels and campgrounds; restaurants; convenience and grocery stores; and gas stations), the total number could be over 300.

4. The Commission anticipates no impacts on the creation of new businesses or the elimination of existing businesses within the state because the proposed action is for increased recreational sea urchin take that is not likely to involve a substantial, consistent increase in diver number of visits or diver expenditures in the affected Mendocino and Monterey areas. The proposed revisions are anticipated to result in no change to possibly a small increase in diving trips to the affected areas of the state throughout the year.

5. The geographic extent of potential economic impacts would be focused within Mendocino and Monterey counties. Although urchin diving is concentrated more in the coastal areas of these counties, divers may drive from all over the state (and out of state) to engage in recreational urchin diving, and their expenditures between origin and destination provide some economic impact to businesses and governments along the way.

6. The Commission does not anticipate any adverse impacts on the creation or elimination of jobs, as the proposed regulatory action is not anticipated to substantially increase the number of diver visits, and thus probable diver expenditures in the Mendocino County, Caspar Cove and in the Monterey County, Tanker Reef areas.

Section B. Estimated Costs

1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime? $0

The proposed regulation does not impose new costs for compliance on businesses or individuals. No new compliance costs are associated with the proposed changes to bag and possession limits.

Divers who choose to participate in urchin removal would need to purchase a sport fishing license if they do not already possess one, but the cost of a license is not specifically due to this regulatory change. The requirement to hold a sport fishing license to engage in sport fishing is established in statute (Fish and Game Code Section 7145).

d. Other Economic Costs: Expenditures on purchases or rentals of wetsuits, SCUBA tanks and oxygen refills, fuel, food, and accommodations are some of the types of spending that may be increased due to this regulation change. The most common recreational methods used to take sea urchins are SCUBA and free-diving that may spur a small increase in local spending on diving equipment rentals and/or purchases.

Section C. Estimated Benefits

1. Briefly summarize the benefits of the regulation.

The Commission anticipates benefits to the State's environment by contributing to the restoration of vital kelp forest ecosystems. Additional generalized benefits to the health and welfare of California residents are anticipated by the increase in recreational sea urchin take and because the program is an effort to restore vital kelp forests that support diverse species and healthier marine ecosystems which many residents value and that may also benefit coastal economies.

3. What are the total statewide benefits from this regulation over its lifetime?

The environmental benefits of kelp forest restoration are uncertain because the extent and long-term viability may be influenced by known and unknown factors outside of this regulation's reach. The potential value of the intended environmental benefits is also difficult to monetize because kelp forest habitat ecosystem services are not market traded.

Section D. Alternatives to the Regulation

1. List alternatives considered and describe. Three alternatives are:

1. The Commission considered allowing only purple sea urchin take at Tanker Reef. However, recent studies suggest that red sea urchin alone still has the potential of overgrazing a reef. The risk of having red sea urchin undermining the restoration effort in an area where there is no commercial red sea urchin take, the temporary nature of this proposal, and the low risk of impact towards the commercial fishery, led to allowing red sea urchin take at Tanker Reef.

2. The Commission also considered adopting a boundary definition for the Tanker Reef area consistent with a petition to the Commission. However, the western edged of the boundary in that proposal was judged too close to nearby vessel traffic. Furthermore, the proposed area was not large enough to cover the entire Tanker Reef where kelp occurs.

3. No Change Alternative. Without the proposed regulatory change, the state will not be able to test the prospect of restoring kelp forests through recreational dive effort.

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered.

There are no anticipated new costs introduced by the proposed regulation or the alternatives considered. However, the proposed regulation could provide benefits that would not be realized through the alternatives considered.

Alternative 1 would not allow for unlimited take of red sea urchin, which could undermine restoration efforts in the Tanker Reef site since there is no commercial harvest of that species to prevent them from precluding kelp recovery. In sum, the anticipated benefits would be less than the proposed regulation.

Alternative 2 would provide fewer additional benefits and could be more dangerous to divers participating in the urchin take activities. In sum, the anticipated benefits would be less than the proposed regulation.

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives:

The environmental benefits of kelp forest restoration are uncertain because the extent and long-term viability may be influenced by known and unknown factors outside of this regulation's reach. The potential value of the intended environmental benefits is also difficult to monetize because kelp forest habitat ecosystem services are not market traded.

Fiscal Impact Statement

The proposed regulation is anticipated to have a neutral to small positive fiscal impact on local government and state government, and no impact on federal funding of state programs.

Fiscal impacts are driven by impacts on individuals' and businesses' spending patterns. Spending on various goods and services, purchases of licenses, as well as potential changes in the number of diving days will be reflected in fiscal impacts by way of local and state taxes, costs or savings to local and state governments, and potentially federal funding to the state.

The proposed action is to make permanent an existing exemption on sea urchin recreational take limits in Caspar Cove, Mendocino County for urchin removal testing, and to add a second urchin removal test site at Tanker Reef in Monterey County. This will likely result in additional visits to the dive sites by recreational urchin divers, shore support, and other travel companions who may purchase fuel, food, or lodging from local businesses.

The Casper Cove events organized by various non-profits have drawn between 30 and 100 divers and shore support crew. Individuals may also dive on their own or in smaller groups than in the organized urchin removal efforts. Using a conservative (i.e. high)

estimate of the number of organized events (15) and visitors per event (100), and individual/small group trips (100) containing an average of 5 people, it is possible that an additional 2,000 visitors will travel to the Mendocino County, Casper Cove area each year.

Since the Tanker Cove location in Monterey County is closer to higher population centers, it is estimated that a of 3,000 individuals may turn out to engage in recreational urchin diving, to provide support from shore, or as travel companions. Overall, this analysis assumes that an additional 5,000 visitors per year may contribute to local economies in Mendocino and Monterey counties as a result of this regulatory action.

A. Fiscal Effect on Local Government

1. Local Government Revenue Impact

Recreational urchin diving expenditures in the retail, food and accommodations, automotive service and fuel, outdoor recreational merchandise sales/rent/lease, and recreational services sectors generate local sales and transient occupancy tax for local governments throughout California.

a. Local Sales Tax

The California State Board of Equalization reports local sales tax rates for all cities and counties in California. The statewide tax rate is 7.25%, and local sales tax rates vary across cities and counties. The impact is expected to be neutral; however, there is a potential for changes in visitor spending due to more urchin diver visits and overnight stays that could result in some increase in local sales taxes. If an additional 5,000 divers and their travel companions visit the affected areas of the state and spend $100 per day, then the average local sales tax (1.25%) impact could amount to about $6,250 across the affected areas.

b. Transient Occupancy Tax (TOT)

Sport diver surveys reveal that those who travel a greater distance to a fishery area are more likely to choose to stay overnight in the area. Those who live in the closest proximity to fishery sites and those who fish in the earliest hours of the day show a lower likelihood of staying overnight. State or federal campgrounds do not collect TOT; however, overnight stays are often at private campgrounds, motels, and hotels, all of which collect TOT. County treasurer tax collectors report the TOTs, with rates in cities and counties ranging from 8% to 12%. Counties and cities located in tourism-dominated areas rely quite a bit on TOT revenues for their general funds.

If an additional 5,000 divers and their travel companions visit the affected areas of the state and one half or 2,500 stay overnight at least one day, then the average TOT tax (10.0%) impact could amount to about $20,000 across the affected areas.

B. Fiscal Effect on State Government

1. State Government Sales Tax Revenue

The state sales tax rate is currently 7.25%. The proposed regulation is not anticipated to induce any change in the typical quantity of state sales tax generated by recreational urchin diving, but if an additional 5,000 divers and their travel companions visit the affected areas of the state and spend $100 per day then the state sales tax impact could amount to about $36,250.

2. California Department of Fish and Wildlife (CDFW) Revenue Impact

No change in administration or enforcement costs are anticipated by CDFW or other state agencies. Consideration was given to keep administrative and enforcement costs within existing budgets.

Divers who choose to participate in urchin removal would need to purchase a sport fishing license if they do not already possess one, but the cost of a license is not specifically due to this regulatory change. The requirement to hold a sport fishing license to engage in recreational fishing is established in statute (Fish and Game Code Section 7145). Sport fishing licenses or 1-day or 2-day licenses, etc. are sold at various price points depending on state residence, age, veteran status, disabilities, and other considerations.

The proposed regulation may be associated with a small increase in sport fishing license revenue received by CDFW. If a generous expectation of 1,000 new entrants to sport fishing purchased a Resident Annual Sport Fishing License at $51.02 each, then CDFW could receive $51,020 in additional license sales revenue. It's likely that some of those new entrants would purchase a 1-day ($16.46) or 2-day ($25.66) license rather than a full-priced annual license, which would decrease the amount of revenue received (between $16,460 and $25,660).

C. Fiscal Effect on Federal Funding of State Programs

Federal Grant Funding to CDFW

The proposed regulation is not expected to affect CDFW's federal grant funding.

Amendments to Recreational Sea Urchin Regulations for Caspar Cove and Tanker Reef

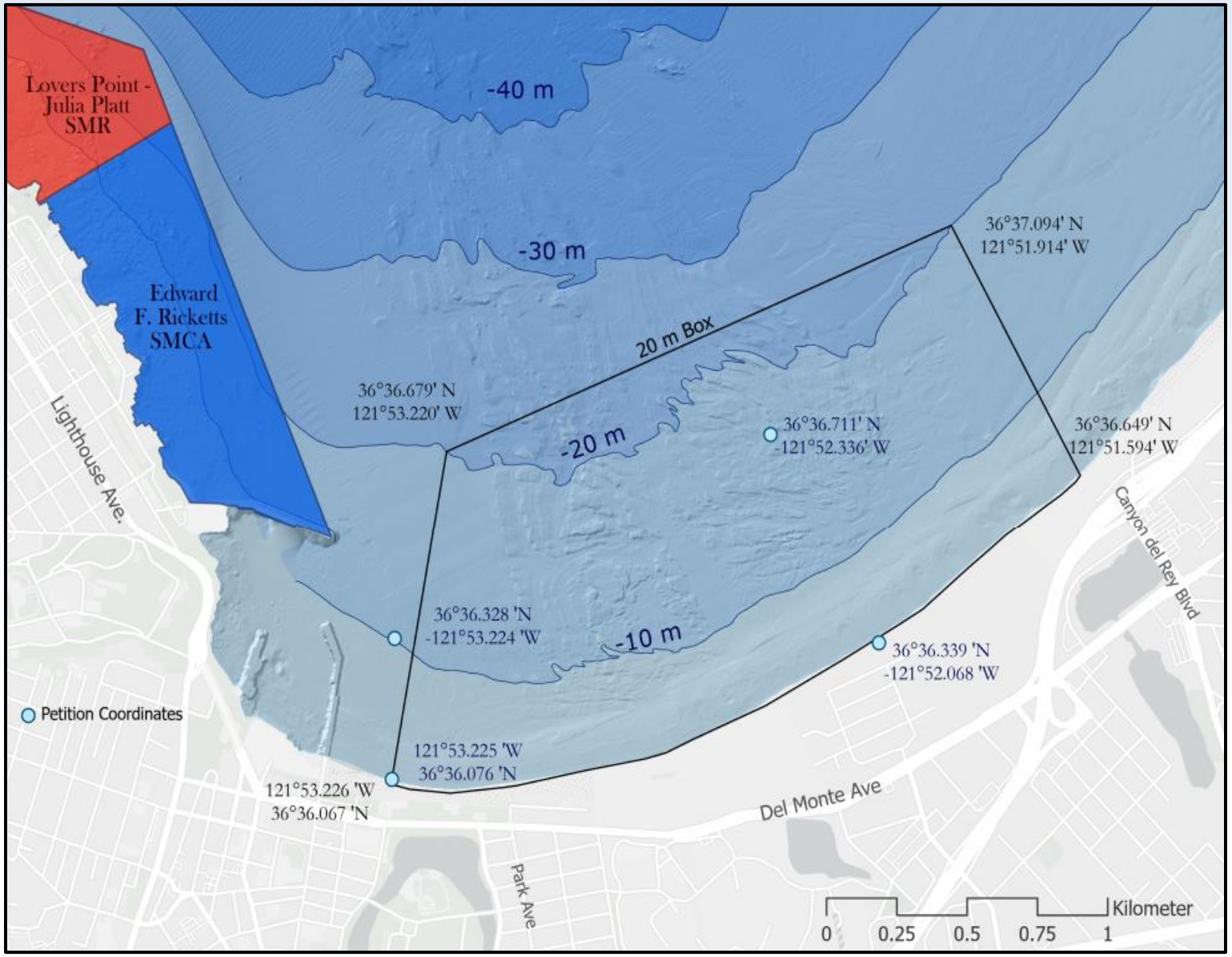
California Fish and Game Commission Meeting
October 14, 2020

Sonke Mastrup
Environmental Program Manager
Marine Region

Proposed Amendments

- Proposed Amendments:
  - Extend the Caspar Cove regulations
  - Add Tanker Reef
    - Community led project
    - Project Area
    - Purple and Red Urchin
  - Sunset Date: April 1, 2024

Proposed boundary for Tanker Reef restoration site



Timeline

- August 2020 – Notice
- October 2020 – Discussion
- December 2020 – Potential adoption

Thank You

Sonke Mastrup

Environmental Program Manager

Sonke.Mastrup@Wildlife.ca.gov

CALIFORNIA FISH AND GAME COMMISSION PETITIONS FOR REGULATION CHANGE - ACTION

Revised 10/06/2020

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

Grant: FGC is willing to consider the petitioned action through a process Deny: FGC is not willing to consider the petitioned action Refer: FGC needs more information before deciding whether to grant or deny

Tracking No.	Date Received	Name of Petitioner	Subject of Request	Short Description	Referral Date	Referred to	FGC Receipt Scheduled	FGC Action Scheduled	Staff Recommendation	Marine, Wildlife, or Admin?
2020-007	7/10/2020	Russell Goltz	Authorize surfboard fishing at South La Jolla State Marine Reserve	Amend marine protected area regulations to allow surfboard fishing at the South La Jolla State Marine Reserve.			8/19-20/2020	10/14/2020	DENY; this state marine reserve was designed to provide a high level of protection contiguously from shore to deep waters based on science guidelines; allowing fishing within a nearshore portion of the SMR would be inconsistent with the intent of the marine protected area as designed.	Marine
2020-008	6/10/2020	Thomas Wheeler	Suspend or reduce elk hunting in Northwestern Elk Hunt Area	Suspend indefinitely all elk hunting (excluding by DFW depredation permit) in the Northwestern Elk Hunt Area or reduce tags issued under 14 Cal. Code Regs §§ 364, 364.1 to zero.	8/20/2020	WRC	6/24-25/2020	10/14/2020	WRC: DENY; the petition based on information presented by DFW at the Sep 2020 WRC meeting. FGC Staff: DENY; the effects of TAHD have already been factored into the elk harvest model through general mortality calculations. No adjustment for current elk harvest is needed, but DFW will continue to monitor TAHD and adjust it's recommendations to FGC accordingly.	Wildlife
2020-009	6/25/2020	Rebecca Dmytryk	Require reporting of mammals taken for nuisance wildlife control on annual trapping reports	Amend Section 467 to require licensed trappers to include all furbearing and nongame mammals (excluding non-native mice and rats, gophers, voles) taken through nuisance wildlife control operations in their annual submission of take, as per Section 467 Trapping Reports.			8/19-20/2020	10/14/2020	Withdrawn by petitioner.	Wildlife
2020-010	7/28/2020	Shaun Reid	Reduce bag limit for wild rainbow and brown trout at Stanislaus River and Beaver Creek	Change the limit of wild rainbow and brown trout on the North Fork of the Stanislaus River and Beaver Creek to zero.			8/19-20/2020	10/14/2020	DENY; trout limits for these waters is being considered in the simplification of statewide sport fishing regulations. The proposal for the north fork of the Stanislaus River is to move to the statewide regulation for rivers and streams (from the last Saturday in April through November 15, five trout daily bag limit, 10 trout in possession; and, from November 16 through the Friday preceding the last Saturday in April, 0 trout bag limit, artificial lures with barbless hooks only and trout must be released unharmed and not removed from the water). The proposal for Beaver Creek is the Saturday preceding Memorial Day through the last day in February, 2 trout, artificial lures. Further information is available in the materials for Agenda Item 16, this meeting.	Wildlife

Tracking Number: (__2020-007 AM 1__)

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, (physical address) 1416 Ninth Street, Suite 1320, Sacramento, CA 95814, (mailing address) P.O. Box 944209, Sacramento, CA 94244-2090 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: Russell Goltz
Address:
Telephone number
Email address

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested : **Rulemaking Authority:** Sections 200, 205(c), 265, 399, 1590, 1591, 2860, 2861 and 6750, Fish and Game Code; and Sections 36725(a) and 36725(e), Public Resources Code2020-007

3. Overview (Required) - Summarize the proposed changes to regulations – Please allow surfboard fishing at the South La Jolla State Marine Preserve. If we can get out there without using gas or electric, just arm power, it will limit the number of fishermen to a minimum amount. No Sport Fishing Boats. You can even make it a catch and release required, that would be fine. I just want to be able to again walk across the street and go fishing from my surfboard.

4. Rationale (Required) - Describe the problem and the reason for the proposed change – The problem is I have to drive 3 miles to be able to do my favorite thing in the world to do. I am 65 years old, and only have a few years left to be able to do this sport. The way I read the California Constitution, Article 1 Section 25, and since it's not a "Fishery", I should be able to fish there. But I understand the way of the world, all I want is for ME to be able to fish at Tourmaline Street in Pacific Beach.

SECTION II: Optional Information

5. Date of Petition 06-03-2020

6. Category of Proposed Change

X 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 X 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 – As soon as possible!

10. Supporting documentation: Identify and attach to the petition any information supporting the proposal including data, reports and other documents – attached are a few documents for your reading pleasure.

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 -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

Tracking Number: (_2020-008_)

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, (physical address) 1416 Ninth Street, Suite 1320, Sacramento, CA 95814, (mailing address) P.O. Box 944209, Sacramento, CA 94244-2090 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: Thomas Wheeler
Address: 145 G St., Ste. A, Arcata, CA 95521
Telephone number: (707) 822-7711
Email address: tom@wildcalifornia.org

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: Government Code § 11342.545; Fish and Game Code §§ 200, 332, 339

3. Overview (Required) - Summarize the proposed changes to regulations:

14 Cal. Code Regs. § 364.2

All elk hunting, excluding hunting conducted pursuant to a depredation permit issued by the California Department of Fish and Wildlife, in the Northwestern Elk Hunt Area is indefinitely suspended.

Alternatively, the same effect of the proposed regulation could be achieved by reducing the tags issued under 14 Cal. Code Regs §§ 364, 364.1 to zero.

4. Rationale (Required) - Describe the problem and the reason for the proposed change:

In early April 2020, the California Department of Fish and Wildlife discovered the presence of a novel disease, treponema-associated hoof disease, affecting the hooves of Roosevelt elk in Del Norte County. Shortly thereafter, on April 16, 2020, the California Fish and Game Commission approved new hunting regulations providing for tag numbers for elk in California. Unfortunately, the discovery of the disease was not disclosed to the Commission. Until the Department and Commission have the opportunity to consider the ramifications of the disease (including the cumulative effects of the disease together with approved hunting), ways to minimize the spread of the disease and measures to mitigate the harm to infected individuals and herds, it is necessary to rein back elk hunting in the Northwest Elk Hunt Area. The proposed rule would institute a temporary

moratorium on hunting elk within the infected area thereby providing time for the Department to issue a containment and management strategy. The proposed rule, as written, would continue to allow hunting pursued under a depredation permit issued by the Department.

As explained below, the disease may cause population declines in affected herds and the effects of the disease were never studied by the Commission before making its decision, in the mandated Elk Management Plan, or in the environmental impact documents prepared for the Commission.

TAHD May Affect Elk Populations

Research concerning the effects of the disease on local herd populations is scant. Existing information does raise a logical conclusion that the disease may affect herd populations by reducing the fitness of elk.

In an infected herd near Mount St. Helens, populations have declined by approximately 30-35% over a four-year period (2009-2013). (McCorquodale et al. 2014.) It is unclear what role the disease may have played in this decline because this period coincided with an effort to reduce the population of elk through increased hunting and severe weather in winter 2012. While researchers were unable to untangle the role of the disease in the population decline, the authors did note that the "seemingly logical assumption that some additional mortality risk is likely associated with advanced disease." (McCorquodale et al. 2014.)

Additional research from Washington State is ongoing and a final reported is anticipated in 2020. A preliminary report on findings, Hoenes et al. (2018), expresses why TAHD has the potential to inflict population-level impacts:

> It is reasonable to assume that elk with advanced stages of TAHD have a decreased probability of survival because their infirmities may predispose them to predation, harvest, severe weather events, or other types of disease (Bender et al. 2008). For example, mule deer with chronic wasting disease (CWD), prior to developing obvious clinical signs, have been shown to be more vulnerable to predation (Miller et al. 2008, Krumm et al. 2009), vehicle collisions (Krumm et al. 2005), and possibly harvest (Conner et al. 2000). This is an important consideration because the growth rate of large ungulate populations, such as elk, is highly sensitive to changes in adult female survival (Nelson and Peek 1982, Eberhardt 2002) and strongly correlated with the production and survival of juveniles (Gaillard et al. 2000; see also Smith and Anderson 1998, Raithel et al. 2007). When adult female and juvenile survival are concurrently reduced, populations would be expected to decline (Gaillard et al. 2000; see also Bender et al. 2007, McCorquodale et al. 2014). Consequently, if TAHD reduces the survival of adult females and calves, it has the potential to have a negative effect on the population dynamics of impacted elk herds.

Preliminary results also raise concerns, although the author notes it is too soon to make any definitive statement about the effect of the disease. Among the preliminary conclusions:

> Elk affected by TAHD have had lower levels of condition in December, lower pregnancy rates, lower lactation rates, and lower annual survival rates. Our estimates of IFBF in December indicate elk in the Mount St. Helens elk herd area continue to experience strong nutritional limitations during late-summer and autumn, regardless of disease status. Irrespective of proximate cause, 0.88 of the mortalities we have documented for elk affected by TAHD, have

included animals that had bone marrow content levels indicative of a severe negative energy balance. (Hoenes et al., 2018.)

The Commission was Unable to Consider the TAHD During its April Deliberations

Although the disease was discovered in early April 2020, the Commission was seemingly not informed about its discovery before the April 16, 2020 meeting where the Department approved new elk tag quotas for the coming year. EPIC has an outstanding Public Records Act request with the Department to ascertain what was known and by whom by the date of this meeting.

Environmental advocates raised their alarm at the May 14, 2020 teleconference and the May 14, 2020 Wildlife Resources meeting. At these meetings, the Department expressed that the disease was a concern and that they were in talks with sister agencies in Oregon and Washington about the disease. Furthermore, at the meeting, the Department promised to produce a specific plan to address TAHD. This plan has not yet been issued.

The Statewide Elk Management Plan Does Not Consider TAHD

As directed by the California legislature, elk within the state are to be managed by a "statewide elk management plan." Fish and Game Code § 3952. This plan is directed to consider, inter alia, "[m]ajor factors affecting elk within the state," including disease. The current elk management plan, published by the Department in 2018, does not consider TAHD.

Environmental Impact Analysis Did Not Consider TAHD

Because the issue of TAHD was unknown to the Commission at the time, the environmental documents necessary for compliance with the California Environmental Quality Act failed to consider the direct and cumulative impacts of TAHD on the species. Without study, it is unknown what the impacts of the disease, together with other stressors, such as hunting, will be on the species.

Northcoast Elk are Irreplaceable

Northcoast Roosevelt elk are irreplaceable between these elk have not undergone hybridization with other elk subspecies. Although Roosevelt elk exist across four U.S. states (Alaska, California, Oregon, and Washington), the Northcoast population is perhaps the only that has not experienced recent hybridization with other sympatric elk species. (Meredith et al., 2007.) In other words, the Northcoast Roosevelt elk possess unique genetics and represent a "pure" Roosevelt elk without the effects of crossbreeding. For this reason, Meredith et al. (2007) has proposed that these elk constitute an "evolutionarily significant unit." Population declines in herds of this region are therefore significant in a manner that similar declines in other areas would not be.

SECTION II: Optional Information

5. Date of Petition: June 10, 2020

6. Category of Proposed Change

☐ Sport Fishing
☐ Commercial Fishing
X 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.
X Add New Title 14 Section(s): 364.2
☐ 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: This petition is in response to a novel threat to Roosevelt elk in the Northwest Elk Management Area. Accordingly, we file this petition as an emergency petition and ask for the rule to come into effect immediately.

10. Supporting documentation: Identify and attach to the petition any information supporting the proposal including data, reports and other documents:

Attached to this petition are the following publications concerning TAHD in Roosevelt elk:

Hoenes, B., George, B., Holman, E. and Stephens, N. 2018. Assessing the potential effects of treponeme associated hoof disease (TAHD) on elk population dynamics in Southwest Washington. Washington Department of Fish and Wildlife, Olympia, Washington USA.

McCorquodale, S. M., P. J. Miller, S. M. Bergh and E. W. Holman. 2014. Mount St. Helens elk population assessment: 2009-2013. Washington Department of Fish and Wildlife, Olympia, Washington, USA.

Meredith, E., Rodzen, J., Banks, J., Schaefer, R., Ernest, H., Famula, T., May, B. 2007. Microsatellite Analysis of Three Subspecies of Elk (*Cervus elaphus*) in California, *Journal of Mammalogy*, Volume 88, Issue 3, Pages 801–808, https://doi.org/10.1644/06-MAMM-A-014R.1

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:

Fiscal impacts of the proposed regulation are unknown.

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

Journal of Mammalogy, 88(3):801–808, 2007

MICROSATELLITE ANALYSIS OF THREE SUBSPECIES OF ELK (*CERVUS ELAPHUS*) IN CALIFORNIA

E. P. Meredith, J. A. Rodzen,* J. D. Banks, R. Schaefer, H. B. Ernest, T. R. Famula, and B. P. May

California Department of Fish and Game, Wildlife Forensics Laboratory, 1701 Nimbus Road, Suite D, Rancho Cordova, CA 95670, USA (EPM, JAR, JDB, RS)
Wildlife and Ecology Unit, Veterinary Genetics Laboratory, University of California Davis, One Shields Avenue, Davis, CA 95616, USA (HBE)
Department of Animal Science, University of California Davis, One Shields Avenue, Davis, CA 95616, USA (EPM, TRF, BPM)

A total of 676 elk (*Cervus elaphus*) were genotyped at 16 tetranucleotide microsatellite loci to evaluate genetic differences among 3 subspecies of elk in California: tule (*C. e. nannodes*), Roosevelt (*C. e. roosevelti*), and Rocky Mountain (*C. e. nelsoni*) elk. Of the 13 populations analyzed, 5 represented tule elk herds, 3 were Roosevelt elk, 2 were Rocky Mountain elk, and 3 were of uncertain taxonomic status. Overall, populations averaged between 7 and 8 alleles per locus, with observed heterozygosity values ranging from 0.33 to 0.58 per population. Tule elk, which experienced a severe bottleneck in the 1870s, had consistently less genetic diversity than the other subspecies. All 3 subspecies were significantly differentiated, with the greatest genetic distance seen between the tule and Roosevelt subspecies. Assignment of individuals to subspecies using microsatellite data was nearly 100% accurate. Despite the past population bottleneck, significant differences were found among the tule elk herds. Assignment testing of elk from Modoc, Siskiyou, and Shasta counties to determine subspecific status of individuals suggested that these populations contained both Roosevelt and Rocky Mountain elk and their hybrids, indicating that these elk subspecies interbreed where subspecies coexist.

Key words: California, *Cervus elaphus*, elk, genetics, hybrid, microsatellite, population

Elk (*Cervus elaphus*) herds that roamed a large portion of North America have been reduced in both area and number due to hunting pressure and loss of habitat. Although management strategies have aimed to reintroduce elk to some of their original range, these programs are not without potential genetic consequence. Genetic bottlenecks and founder effects are of great concern, and exacerbated by harem mating structure and high variability in male reproductive success (Clutton-Brock 1989).

California contains 3 of the described subspecies of free-ranging elk: tule elk (*C. e. nannodes*; historic resident of oak woodlands and grasslands), Roosevelt elk (*C. e. roosevelti*; northwestern coastal area), and Rocky Mountain (*C. e. nelsoni*; occupying the extreme northeastern corner of California, including Modoc County) elk. The remaining extant subspecies, Manitoban elk (*C. e. manitobensis*), occurs east of the Rocky Mountains in the northern plains states and into central Canada but does not inhabit California. Although each subspecies naturally occurs in different locations within California, there are potential geographic regions of overlap between Roosevelt and Rocky Mountain elk, allowing for the possibility of hybrid zones.

Tule elk residing in the Central Valley and oak woodlands of the foothills of California were almost eliminated after the gold rush of 1849 (McCullough et al. 1996). Historically estimated at more than 500,000 animals, tule elk were compromised by extreme hunting pressure and conversion of grass and woodland habitat into farming and agricultural operations. In 1873, when tule elk were thought to be extinct, protection was granted by the state of California (McCullough 1969; McCullough et al. 1996). Although exact numbers vary, it is believed that at least a single breeding pair of tule elk was found and protected in the southern San Joaquin Valley in Kern County, California, in 1874. Those remaining elk are believed to be the ancestors of extant tule elk populations in California (McCullough 1969; McCullough et al. 1996).

Roosevelt elk inhabit their historical range in the northwestern coastal mountain ranges of California (O'Gara 2002), mainly Humboldt and Del Norte counties. Only elk inhabiting these 2 counties are categorized as Roosevelt elk by the Boone

* *Correspondent: jrodzen@dfg.ca.gov*

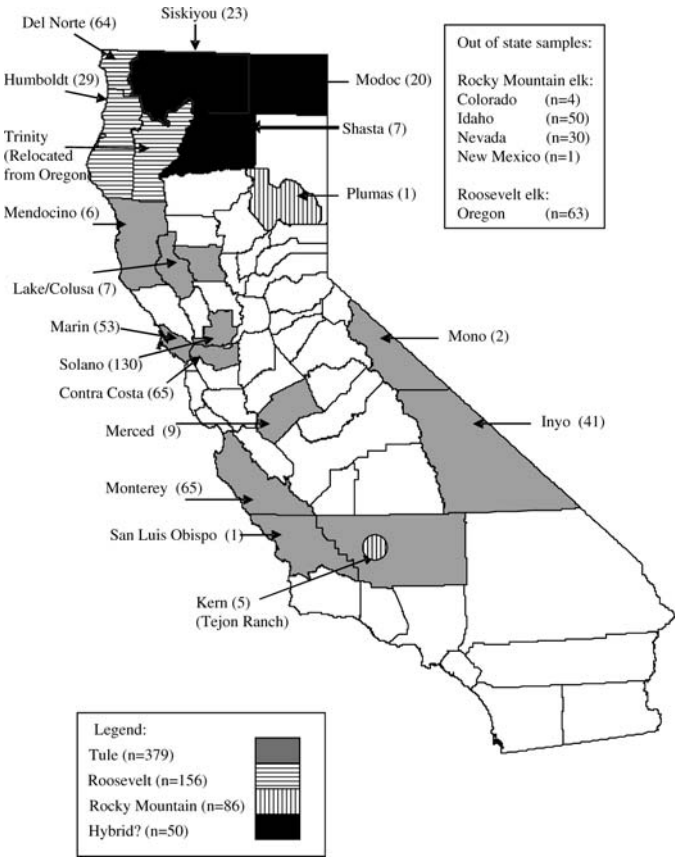


Fig. 1.—Map depicting number of individuals sampled at each herd location given by county name. Gray shaded areas represent counties that contain herds of tule elk, horizontal lines indicate counties with herds of Roosevelt elk, vertical lines indicate counties with herds of supposed Rocky Mountain elk, and diagonal lines indicate potential hybrid zones of Roosevelt and Rocky Mountain elk.

and Crockett Club (Missoula, Montana) for trophy-hunting purposes (Reneau and Reneau 1993). Discrimination of distinct herds of Roosevelt elk is difficult because of the dense forest habitat. Examination of satellite tracking data indicates restricted movement of animals and the possibility of distinct herds (R. Schaefer, in litt.).

Examination of satellite data (R. Schaefer, in litt.) provides evidence that Rocky Mountain Elk of northeastern California may migrate between Modoc County and Oregon, Idaho, and Nevada. Circa 1913, approximately 50 Rocky Mountain elk from Montana were introduced into Shasta County, California (R. Schaefer, in litt.).

Shasta, Siskiyou, and Modoc counties in northern California are considered to be potential hybrid zones for Roosevelt and Rocky Mountain elk by California Department of Fish and Game wildlife managers. For the purpose of our study, the term ''hybrid'' refers to an intraspecific cross. Interstate 5, a major north–south highway in Washington, Oregon, and California, has been used as an arbitrary management boundary for subspecies delineation: elk occurring west of Interstate 5 have been designated Roosevelt and those to the east of Interstate 5 as Rocky Mountain elk. Lone elk are known to wander and travel great distances (>150 miles—R. Schaefer, in litt.), and crossing the unfenced Interstate 5 is likely, as inferred by presence of road-killed elk (R. Schaefer, in litt.). Because Roosevelt and Rocky Mountain trophy elk are recorded separately by hunting organizations, determination of the genetic lineage of animals in these areas will benefit trophy hunters and wildlife managers.

Subspecific status of North American elk has been hotly debated (see O'Gara [2002] for discussion of the taxonomy of North American elk). Overlap of morphological differences among tule, Roosevelt, and Rocky Mountain subspecies demands that other discriminating criteria, such as molecular genetic analyses, are used to address taxonomic status. Tule elk are considered the smallest subspecies of North American elk (Merriam 1905) and are typified by having lower body masses, lighter pelage, and the longest toothrows of any North American subspecies. Roosevelt elk reportedly have the largest body mass and display different antler and jaw morphologies from the others (McCullough 1969; O'Gara 2002). Of the 3 subspecies, Rocky Mountain elk typically have the largest antlers (Reneau and Reneau 1993).

Evidence derived from mitochondrial DNA indicates that tule elk are more closely related to Rocky Mountain than Roosevelt elk, and supports the subspecific status of these 3 categories of elk (Polziehn et al. 1998, 2000; Polziehn and Strobeck 1998, 2002). Using microsatellite data, Williams et al. (2004) showed that tule elk display reduced genetic variation relative to Rocky Mountain and Manitoban elk; however, small sample size prevented robust tests of genetic differentiation among populations of tule elk.

The primary goal of our study was to measure the degree of nuclear genetic differentiation between tule, Roosevelt, and Rocky Mountain elk and evaluate whether the populations of elk in California warrant status as evolutionarily significant units. Given that Roosevelt and Rocky Mountain elk are sympatric in California, yet recorded separately for trophy records, wildlife managers will benefit from genetic information that identifies subspecies composition, particularly in potential hybrid zones. Genetic discriminators will allow identification of subspecies in trophy animals, hair samples from field sampling efforts, and forensic samples. Toward these objectives, we used 2 population assignment programs, WHICHRUN (Banks and Eichert 2000) and STRUCTURE 2.1 (Pritchard et al. 2000), to test the accuracy of assignment to subspecies from multilocus genotype data. Lastly, we assessed the risks and degree of inbreeding faced by herds of tule elk and make recommendations for monitoring and managing these herds.

Materials and Methods

Sample collection and DNA isolation.—A total of 676 elk were analyzed in this study (Fig. 1). The majority of the samples were from a large tissue archive maintained by the California Department of Fish and Game's Wildlife Forensic Laboratory (Rancho Cordova, California). Tissue and blood samples were collected from road-killed animals or animals legally taken at scheduled hunts and elk relocations throughout

California from 1997 through 2003. Samples were shipped frozen on ice to the Wildlife Forensic Laboratory and maintained at −20°C until DNA extraction.

Tule elk from 8 herds were sampled, including 2 of the original 3 surviving herds established in the 1930s: the Owens Valley herd (Inyo County) and the Cache Creek herd (Colusa and Lake counties). The remaining 6 herds of tule elk sampled were created by later translocations; however, all herds of tule elk are descendants from 1 original remnant population.

Samples of Rocky Mountain elk collected from Nevada and Idaho served as reference samples for comparison to Rocky Mountain elk in California. Five Rocky Mountain elk originally translocated from Wyoming to Tejon Ranch in Kern County, California, were sampled. Roosevelt elk from Jewell, Oregon, and translocated to Trinity County, California, between 1988 and 1995 were examined. The Nevada Department of Wildlife supplied muscle tissue samples of 30 Rocky Mountain elk, and the Idaho Department of Fish and Game provided 49 diluted DNA extracts (10 ng/μl) and 1 muscle tissue sample.

The DNA was isolated from all tissue and blood samples using Qiagen QIAmp tissue isolation kits and procedures (Qiagen, Chatsworth, California). After extraction, DNA was quantified using a Molecular Dynamics model 595 Fluorimager (Molecular Dynamics, Sunnyvale, California) using human DNA reference standards of known concentration. DNA from extracted tissue samples was diluted to a concentration of 10 ng/μl; blood extracts were not diluted.

Microsatellite analysis.—Multiplex polymerase chain reaction was used to amplify 16 tetranucleotide microsatellite markers developed specifically for elk or mule deer (*Odocoileus hemionus*; see Table 1 for references). All loci used were developed from enriched libraries by GIS Inc. (Chatsworth, California). These primers were selected based upon their highly repeatable polymerase chain reaction products and variability within and among the 3 subspecies of elk described herein.

Forward primers were fluorescently labeled with 6FAM, VIC, or NED (Applied Biosystems, Foster City, California) and the reverse primer had a 5′-GTTTCTT-3′ extension added to the 5′ end to reduce split peaks and drive the reaction to the "plus A" band (Brownstein et al. 1996). Polymerase chain reaction fragments were detected using a BaseStation DNA Fragment Analyser (MJ Research, Inc., Waltham, Massachusetts).

Each amplification cocktail included up to 20 ng of template DNA, 1X PCR buffer (Applied Biosystems), 2.4 μl of multiplex specific primer concentrations (see below), 0.2 mM of each deoxynucleoside triphosphate, 2 mM $MgCl_2$, and 0.2 U (Multiplex D, A, and E) or 0.25 U (Multiplex N) Amplitaq (Applied Biosystems) and double-distilled H_2O to total 20 μl per reaction. Polymerase chain reaction primer concentrations are indicated in Table 1. Reactions containing at least 5 ng/μl DNA were run on a PTC-100 thermalcycler (MJ Research, Inc.) with the following amplification parameters: 94°C for 3 min, followed by 26 cycles of 94°C for 30 s, 58°C for 30 s, 72°C for 40 s, a final extension at 72°C for 20 min, and a final hold at 10°C. All blood samples and tissue samples containing less than 5 ng/μl DNA were amplified for 30 cycles. One microliter of polymerase chain reaction product was then added to 4 μl of loading buffer (double-distilled H_2O, formamide, blue dextran, Genescan 400HD ROX [Applied Biosystems], and Genescan 500 ROX [Applied Biosystems] mixed in a ratio of 220 μl : 155.2 μl : 51.7 μl : 12 μl : 12 μl). Polymerase chain reaction products were separated using a denaturing 5.5% acrylamide gel (Long Ranger Gel Solution, Cambrex Bio Science Rockland Inc., Rockland, Maine). Gel data analysis and allele sizing were performed using Cartographer (MJ Research, Inc.).

Table 1.—Summary of loci examined in this study. This table shows in which multiplex each locus was amplified, polymerase chain reaction (PCR) primer concentration (each primer), 5′ fluorescent dye label used, number of alleles, heterozygosity values observed (H_O), and the reference in which the original primer sequences can be found. Note that all the reverse primers were modified with a 5′-GTTTCTT sequence to reduce split peaks and encourage the formation of "+A" bands during polymerase chain reaction. References: 1 = Jones et al. (2002); 2 = Meredith et al. (2005); 3 = Jones et al. (2000).

Locus	Multiplex	PCR concentration (μM)	5′ dye label	No. alleles	Size range (base pairs)	H_O	Reference
T108	D	0.100	6Fam	8	136–181	0.540	1
T26	D	0.483	6Fam	12	328–398	0.565	1
T172	D	0.017	Vic	7	174–198	0.450	1
T501	D	0.600	Ned	9	252–290	0.576	1
T268	N	0.092	6Fam	6	228–256	0.437	1
T156	N	0.062	Vic	15	143–249	0.545	1
T507	N	0.062	Ned	11	148–202	0.390	1
C273	N	0.985	6Fam	8	132–166	0.553	2 and 3
T193	A	0.706	6Fam	10	184–220	0.599	1
C217	A	0.212	Vic	2	185–193	0.415	1
T123	A	0.282	Ned	4	155–186	0.399	1
C180	E	0.048	6Fam	4	156–168	0.507	2
T107	E	0.144	Vic	4	242–265	0.326	2
C229	E	0.144	6Fam	5	299–319	0.363	2
C143	E	0.240	Ned	4	166–178	0.492	2
C01	E	0.624	Ned	5	342–358	0.433	2

Statistical methods.—Genotypic data were collected on all 676 samples. However, only those counties or states (Idaho, Nevada, and Oregon) with at least 20 animals ($n = 632$) were used in frequency-based analyses, specifically the calculation of F-statistics and log-likelihood statistics of population differentiation. Because the alleles were not sequenced to determine the actual number of tetranucleotide repeat units, statistical models conforming to the infinite alleles model were used.

Allele frequencies, unique alleles, and observed and expected heterozygosities within counties or states ("populations") with a minimum of 20 individuals and within each of the 3 subspecies were calculated using GENEPOP on the Web (http://www.biomed.curtin.edu.au/genepop—Raymond and Rousset 1995). For frequency-based analyses, the populations of Roosevelt elk used were from Humboldt and Del Norte counties (California) and Jewell, Oregon; the populations of Rocky Mountain elk used were from Nevada and Idaho. Deviations from linkage equilibrium between all pairs of loci

across all populations and conformation to Hardy–Weinberg equilibrium on a locus-by-locus basis within populations also were tested using GENEPOP. The *P*-value for a significant deviation from Hardy–Weinberg equilibrium using the exact test (Guo and Thompson 1992) was adjusted from 0.05 to 0.00027 using a Bonferroni adjustment for 186 tests of the same hypothesis (16 loci by 12 populations with 6 loci being monomorphic in a population). A Bonferroni-adjusted *P*-value of 0.0014 was used to assess significance for multiple tests of deviation from Hardy–Weinberg equilibrium at the subspecies level (3 subspecies and 16 loci).

Quantitative measures of population differentiation (F_{ST}) and inbreeding (F_{IS}) were made among subspecies and among populations within subspecies using the software package FSTAT (FSTAT, a program to estimate and test gene diversities and fixation indices, version 2.9.3, J. Goudet, 2001; http://www.unil.ch/izea/softwares/fstat.html) as described in Weir and Cockerham (1984) after Bonferroni-adjusted pairwise significance levels. Samples from Modoc, Shasta, and Siskiyou counties were not used in the comparisons of subspecies populations because the taxonomy of elk from these 3 counties was uncertain.

Analysis of molecular variance (AMOVA; ARLEQUIN—Schneider et al. 2000) was used to evaluate the degree of population differentiation based on the relative number of repeats. Genotypic data were analyzed using subspecies, populations within subspecies, and individuals within populations as sources of variation.

The measure of genetic distance among 12 of the county or state sampling groups was Nei's standard distance (Ds—Nei 1972), calculated in PHYLIP, version 3.5c (Felsenstein 1993) using GENDIST. The neighbor-joining method was used in NEIGHBOR (PHYLIP, version 3.5c—Felsenstein 1993).

Animals were assigned to subspecies using genotypic data and 2 population assignment software packages, WHICHRUN (Banks and Eichert 2000) and STRUCTURE 2.1 (Pritchard et al. 2000), to test accuracy of assigning to presumptive subspecies. Elk from the hybrid zones were excluded because of the confounding effects of uncertain lineage. A baseline genotype data file was constructed using known reference animals, including 367 tule elk, 156 Roosevelt elk, and 80 Rocky Mountain elk. The tule elk baseline reference samples consisted of animals from Contra Costa County ($n = 65$), Inyo County ($n = 41$), Lake County ($n = 5$), Marin County ($n = 53$), Monterey County ($n = 65$), and Solano County ($n = 130$). Roosevelt elk baseline samples included Del Norte County ($n = 64$), Humboldt County ($n = 29$), and Oregon ($n = 63$). Rocky Mountain elk baseline samples included elk from the states of Idaho ($n = 50$) and Nevada ($n = 30$).

In WHICHRUN, the probability of a given sample belonging to a "critical population" was generated by a likelihood ratio log of odds score of the probabilities of the 1st and 2nd most probable population assignment given that sample's genotype. The baseline data file of the 603 samples was jackknifed, a log of odds score was generated for the most probable population assignment, and each sample was assigned to that subspecies with log of odds score of ≥ 1.0.

WHICHRUN was then used to assign individual elk from Modoc, Siskiyou, and Shasta counties to Rocky Mountain or Roosevelt subspecies with log of odds score of ≥ 1.0. Five elk from the Tejon Ranch (Kern County) and 6 elk from Mendocino County also were analyzed for subspecies verification. The 6 elk from Mendocino County were collected in 2 different locations. An individual was assumed to be a possible hybrid if the log of odds score for both Roosevelt and Rocky Mountain was ≤ 1.0. The same analysis parameters were used for assignment testing of baseline data and for animals of unknown ancestry.

The baseline genetic data also were tested for assignment accuracy using the program STRUCTURE using 100,000 rounds of iteration after a 10,000-round burn-in. The STRUCTURE genetic analysis program also was used to test assignment of reference elk and samples from Modoc, Siskiyou, and Shasta counties. STRUCTURE was used to estimate the number of lineages that comprise the counties or states without using a priori population information. The number of populations (K) was evaluated for 1–20 populations. Most likely number of populations was determined by $\Delta(K)$ as described in Evanno et al. (2005).

Elk were classified as potential hybrids if the most probable subspecies was <10 times more likely than the 2nd most probable subspecies, indicative of past introgression. This is mathematically equivalent to the log of odds score threshold of 1.0 used in WHICHRUN for subspecies assignment.

Results

Measures of genetic diversity.—Within the 676 samples, loci possessed from 2 alleles (locus C217) to 15 (locus T156; average = 7.3) with observed heterozygosity values ranging from 0.33 (locus T107) to 0.60 (locus T193). F_{IS} estimated for the 5 herds of tule elk analyzed ranged from -0.038 (Contra Costa County) to 0.079 (Inyo County). Tule elk displayed the lowest allelic diversity and showed no more than 5 alleles at each locus (average number of alleles = 3.2), with several loci being monomorphic in some of the tule elk herds. Rocky Mountain elk averaged 6.8 alleles per locus and Roosevelt elk were intermediate with an average of 5.2.

The 16 loci did not show departures from Hardy–Weinberg equilibrium within analyzed counties or states after a Bonferroni correction. However, when data were pooled by subspecies, several loci departed from Hardy–Weinberg equilibrium. No loci deviated significantly from Hardy–Weinberg equilibrium in the 80 samples of Rocky Mountain elk, 6 loci deviated from Hardy–Weinberg equilibrium within the samples of tule elk, and 1 locus deviated significantly from Hardy–Weinberg equilibrium within the samples of Roosevelt elk.

Relationships among subspecies and populations (Table 2).—There were significant differences in allele frequencies among populations of tule elk. Exact tests of population differentiation yielded a *P*-value of <0.0002 and significance at all pairwise comparisons of the tule elk herds (1% level after Bonferroni corrections). The overall value of F_{ST} for the 5 populations of tule elk was 0.11.

TABLE 2.—Genetic distances among the 3 subspecies of elk (*Cervus elaphus*) in California and their populations. Data are presented for both the population and subspecific levels of comparison. Nei's standard genetic distance values are above the diagonal and F_{ST} values are below. Significance levels for pairwise tests are: *** $P = 0.001$, ** $P = 0.01$, and * $P = 0.05$ after a Bonferroni correction. The Oregon samples were collected from animals released into California from Oregon. Sample sizes for each population or herd are given in Fig. 1.

	Tule elk herds					Roosevelt elk populations			Rocky Mountain elk populations		Subspecies		
	Contra Costa	Inyo	Marin	Monterey	Solano	Del Norte	Humboldt	Oregon	Idaho	Nevada	Tule	Roosevelt	Rocky Mountain
Tule													
Contra Costa	—	0.03	0.12	0.03	0.07	0.49	0.64	0.42	0.46	0.62			
Inyo	0.06**	—	0.11	0.02	0.08	0.54	0.74	0.50	0.47	0.63			
Marin	0.19**	0.14**	—	0.10	0.08	0.42	0.61	0.34	0.37	0.45			
Monterey	0.07**	0.03**	0.13**	—	0.06	0.55	0.71	0.45	0.45	0.56			
Solano	0.12**	0.12**	0.10**	0.10**	—	0.41	0.59	0.39	0.39	0.53			
Roosevelt													
Del Norte	0.37**	0.33**	0.25**	0.34**	0.29**	—	0.18	0.09	0.31	0.53			
Humboldt	0.47**	0.42**	0.34**	0.42**	0.37**	0.12*	—	0.25	0.47	0.61			
Oregon	0.40**	0.37**	0.27**	0.37**	0.31**	0.06*	0.16*	—	0.17	0.31			
Rocky Mountain													
Idaho	0.33**	0.28**	0.21**	0.28**	0.27**	0.14**	0.19**	0.13**	—	0.09			
Nevada	0.38**	0.33**	0.25**	0.33**	0.31**	0.20**	0.24**	0.18**	0.03*	—			
Subspecies													
Tule											—	0.55	0.48
Roosevelt											0.30*	—	0.31
Rocky Mountain											0.28*	0.14*	—

Exact tests of population differentiation, as measured by allele frequencies, were highly significant ($P < 0.0002$) among populations of Roosevelt elk (Oregon and Humboldt and Del Norte counties) and among populations of Rocky Mountain elk (Nevada and Idaho). F_{ST} values among populations of Roosevelt elk ($F_{ST} = 0.096$) and between populations of Rocky Mountain elk ($F_{ST} = 0.03$) were less than those observed among herds of tule elk. Individual populations of Roosevelt and Rocky Mountain elk showed significant differentiation at the 5% nominal level after Bonferroni corrections.

Data from the 3 subspecies were analyzed as a whole and tested for population differentiation using subspecies as the source of variation (Table 2). A highly significant Exact test ($P < 0.0002$) suggested that there were greater differences in allele frequencies among the 3 subspecies than among populations or herds within any of the 3 subspecies. Pairwise tests of differentiation between the 3 subspecies were all significant at the 5% nominal level of significance after a Bonferroni correction. The AMOVA results (Table 3) indicated that the subspecies are well differentiated.

STRUCTURE yielded results, both in terms of K populations and $\Delta(K)$, that suggested the sampled elk are from 2 "populations": tule and Roosevelt–Rocky Mountain elk lineages. Although the likelihood values for $K = 1$–20 populations approached a maximum at $K = 3$ populations, the $\Delta(K)$ values spiked at $K = 2$ populations.

Subspecies clustered distinctly, with 100% bootstrap support between tule elk and the other 2 subspecies (Fig. 2). The node separating the 2 Rocky Mountain elk populations (Idaho and Nevada) from the other subspecies populations had a 94% level of bootstrap support.

Assignment testing.—All of the 367 samples presumptively categorized by wildlife managers as tule elk assigned correctly using both WHICHRUN and STRUCTURE (Table 4). STRUCTURE was slightly more accurate in assigning reference elk to their presumptive subspecies, although both programs yielded a very high success rate of correct assignment. Population assignment of Roosevelt and Rocky Mountain elk had a small error rate (<5%), which varied by analysis program. One presumptive Roosevelt elk collected from eastern Oregon (Bend, Oregon) was assigned to the Rocky Mountain subspecies with >3.0 log of odds score.

Assignment testing of individual elk using both STRUCTRE and WHICHRUN (Table 5) revealed that Modoc, Shasta, and Siskiyou counties were inhabited by Rocky Mountain, Roosevelt, and hybrid elk. The same individuals were identified as hybrids by both programs. The 5 individuals from the Tejon Ranch in Kern County were correctly assigned as Rocky Mountain elk. The 6 elk from Mendocino County consisted of 2 Roosevelt elk and 4 tule elk.

TABLE 3.—Analysis of molecular variance of 3 subspecies of elk (*Cervus elaphus*) in California using subspecies, populations within subspecies, and individuals as sources of variation. Samples were collected from 1997 through 2003.

Source of variation	*d.f.*	Sum of squares	Variance components	Percentage of variation (%)
Among subspecies	2	905.12	1.253 Va	24.18
Among populations within subspecies	7	319.94	0.3631 Vb	7.00
Within populations	1,170	4,174.93	3.568 Vc	68.81
Total	1,179	5,399.99	5.185	

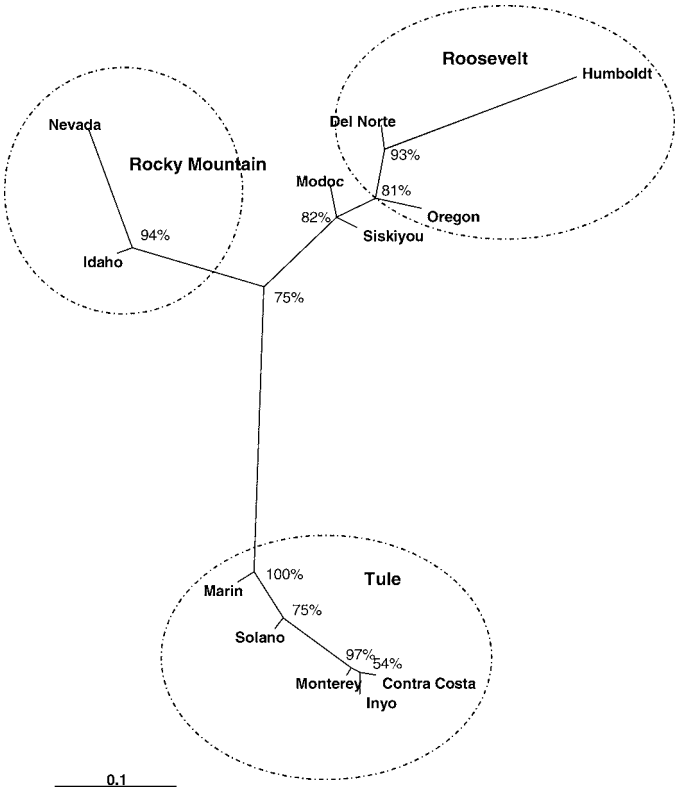


Fig. 2.—Unrooted tree of Nei's standard genetic distance after bootstrapping the data 1,000 times. The bootstrap level of support (out of 1,000) is indicated at each node. Included are all populations of elk with at least 20 samples.

Discussion

Tule elk have much reduced microsatellite variation compared to the Roosevelt and Rocky Mountain elk subspecies, as expected given the severe population bottleneck in the late 1800s. The low level of genetic variability in the tule elk was likely due to the low numbers of founders rather than insufficient sampling, because sampling collections were well distributed among herds. Thus, the molecular genetic uniqueness of the tule elk resulted from lack of genetic variation, not from novel genetic variability.

Tule elk may have been reduced to 1 breeding pair in 1874 (McCullough et al. 1996). Barring a mutation event or experimental error, the presence of 5 alleles at 1 locus requires that the tule elk subspecies was reduced to no fewer than 1 female and 2 males, or vice versa. Allele frequencies varied significantly among the herds of tule elk. The results also suggest that the herds in Contra Costa, Inyo, and Monterey counties were more closely related than the other 2 herds of tule elk; the Marin herd was the most distantly related. This also was reflected in the phylogenetic results (Fig. 2) and follows logically from historical information on relocations (McCullough et al. 1996). Because all tule elk originated from the same herd, founder effects and genetic drift likely caused the herds to diverge genetically in spite of relocation efforts.

Although tule elk do not currently display the effects of reduced fitness, such as low reproductive output and morphological deformities, the individual herds are definitely at risk if they remain genetically isolated. However, reduced genetic variation at neutral loci does not necessarily indicate a lack of adaptability (Hedrick 1999, 2001) and would not warrant intentional crossbreeding with Roosevelt or Rocky Mountain elk.

We propose the following management recommendations for tule elk given the genetic data and their life-history characteristics. Management of tule herds should continue to involve the movement of animals, preferably mature females, between the tule herds. Adult female elk would be much more likely to contribute genetically because of the harem mating structure, because an introduced male elk would likely have to establish dominance before breeding. Translocating elk among Inyo, Contra Costa, and Monterey counties should not negatively impact genetic diversity of these 3 herds, because they are closely related.

Periodic monitoring of the physical health and genetics of the tule herds is required in order to detect a rise in frequency of deleterious inherited phenotypes, reduced fitness, and other effects of inbreeding. Although the 6 elk samples from Mendocino County were either pure tule or pure Roosevelt and did not indicate crossbreeding, the elk in the Mendocino and Lake county areas should be monitored for hybridization. The tule and Roosevelt elk sampled were from 2 differ-

Table 4.—Assignment test results for 3 subspecies of elk (*Cervus elaphus*) in California using programs WHICHRUN and STRUCTURE 2.1. The numbers of correct assignments are on the diagonal and incorrect assignment counts are off the diagonal for each program.

Software	Subspecies	*n*	Tule	Roosevelt	Rocky Mtn.
WHICHRUN	Tule	367	367	—	—
	Roosevelt	156	—	151	5
	Rocky Mountain	80	—	1	79
STRUCTURE 2.1	Tule	367	367	—	—
	Roosevelt	156	—	154	1
	Rocky Mountain	80	—	—	80

Table 5.—Assignment tests of elk from Modoc, Siskiyou, Shasta, and Kern counties, California, using programs WHICHRUN and STRUCTURE. Animals are noted as potential hybrids using WHICHRUN when the log of odds score of assignment was less than 1.0, and when the probability of assignment was less than 10 times the 2nd most probable subspecies using STRUCTURE.

	County			
Program	Modoc ($n = 20$)	Siskiyou ($n = 23$)	Shasta ($n = 7$)	Kern ($n = 5$)
WHICHRUN				
Roosevelt	9	15	1	0
Rocky Mountain	10	2	5	5
Hybrid	1	5	1	0
STRUCTURE 2.1				
Roosevelt	9	15	1	0
Rocky Mountain	10	2	5	5
Hybrid	1	5	1	0

ent locations and did not occur sympatrically. Tule elk in Mendocino County have recently been detected in close proximity to Roosevelt elk (R. Schaefer, in litt.). Introgression of Roosevelt elk into these tule herds should prohibit their use for future transplants.

The reproductive strategy of elk makes this species vulnerable to the loss of genetic diversity. Williams et al. (2002, 2004) applied theory and computer simulation to conclude that elk in small isolated herds tend to lose genetic variation and heterozygosity. The effect of small population size is magnified by the highly polygynous nature of elk, and even brief bottlenecks can have a large effect on the number of alleles and heterozygosity of species with this mating system.

The effects of a small population size on a mammal are well illustrated by research on Florida panthers (*Puma concolor coryi*). Hedrick (2001) suggested that populations that remain small over a long time period would incur a large genetic load from fixation of many deleterious alleles of small effect, as seen in the Florida panther. Even with an effective population size of 30–50, this subspecies of panther so rapidly accumulated deleterious alleles through drift and inbreeding that it was in serious danger of extinction (Hedrick 1995).

Population assignment for individual reference elk with known source populations using multilocus genotype data was concordant with source population records because of highly significant differences in allele frequencies observed between the subspecies. Two population assignment software programs, WHICHRUN and STRUCTURE, yielded nearly identical assignment accuracies. This high degree of accuracy is important from a forensic standpoint because tule elk are a heavily managed subspecies within California; recaptured escapees from game refuges and evidence from suspected cases of tule elk poaching now can be reliably identified to subspecies.

Elk present in the northern California counties of Modoc, Siskiyou, and Shasta are genetically Roosevelt elk, Rocky Mountain elk, or hybrids of these 2 subspecies. Thus, trophy elk taken by sportsmen from these counties cannot be reliably assigned to subspecies in the absence of molecular genetic information. The unique genetic character of Roosevelt elk from California merits careful monitoring of translocations of elk if new animals are moved into the existing herds in Humboldt and Del Norte counties from areas containing elk of mixed ancestry.

Our analyses lend strong support to previously published work suggesting that tule, Roosevelt, and Rocky Mountain elk should be designated as discrete subspecies (Polziehn et al. 1998, 2000; Polziehn and Strobeck 1998, 2002) and as evolutionarily significant units. Values of F_{ST} and log-likelihood values for tests of population differentiation were highly significant. AMOVA results indicated that the subspecies are well differentiated and gene flow has likely occurred among populations within the subspecies.

The criteria used for determining which populations comprise an evolutionarily significant unit have been the topic of considerable debate (i.e., Crandall et al. 2000; Fraser and Bernatchez 2001; Moritz 1994, 2002). We incorporated criteria from these studies and propose evolutionarily significant units for elk in California. Tule elk displayed highly significant differences in nuclear allele frequencies relative to other elk populations, consistent with the criteria of Waples (1991) and Moritz (1994, 2002). Given its unique ecological niche, evolutionarily significant unit status is warranted under the ''ecological exchangeability'' concept of Crandall et al. (2000).

We propose evolutionarily significant unit status for Roosevelt elk of the north coast of California (Humboldt and Del Norte counties). Again, significant genetic divergence was observed between this group and the other sampled populations. Because Roosevelt elk from the Olympic Peninsula in Washington State may have some Rocky Mountain introgression (Polziehn and Strobeck 2002), care (and perhaps genetic testing) is essential before translocating elk from the Olympic Peninsular to augment Roosevelt elk in other regions, including California.

Rocky Mountain elk are the least populous elk in California, although they exist in great numbers in the mountains of the western United States. They are genetically distinct from both the Roosevelt and tule elk and inhabit environments where the tule elk are absent. The only pure population of Rocky Mountain elk within California identified from this study occurs at Tejon Ranch (Kern County). These animals originally were imported from Yellowstone National Park, Wyoming. California Department of Fish and Game managers had expressed concern that these animals had bred with tule elk at 1 point in time; this concern appears unfounded. Rocky Mountain elk and tule elk are held at 2 physically separated ranches in Kern County. Although Rocky Mountain elk are sympatric with Roosevelt elk in northern California, their range extends beyond that of Roosevelt elk east into the Rocky Mountains. Elk taken from the counties containing hybrids should be genetically tested on an individual basis to determine the subspecies of their source. Polziehn et al. (2000) documented that population subdivision and restricted gene flow occurs in herds of Rocky Mountain elk, many of which were relocated or reintroduced. Considering that this subspecies covers a large geographic area, future studies covering larger geographic areas are likely to identify additional Rocky Mountain elk evolutionarily significant units.

To date, our study is the most comprehensive population genetic analysis of the 3 subspecies of elk inhabiting California and should provide valuable information for elk managers and wildlife law enforcement. Future conservation efforts should focus on ensuring connectivity between herds or populations within each evolutionarily significant unit to ensure that adaptive genetic variation is maintained in a large population and not removed by genetic drift or fixed by inbreeding in small isolated populations. Current population management efforts focus primarily on the protected tule elk, maintained as several distinct, isolated herds across the state. We recommend the continued translocation of tule elk between the herds in order to maintain the genetic diversity of the tule subspecies and avoid the potential inbreeding that can occur in small polygynous herds.

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Mount St. Helens Elk Population Assessment: 2009-2013

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Washington Department of Fish and Wildlife

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EXECUTIVE SUMMARY

In 2009, we initiated a study of the Mount St. Helens elk population to better quantify elk abundance, develop a practical and defensible population monitoring approach, and document recent trends in elk condition, productivity, and survival. During 2009-2012, we captured and radiomarked 150 unique elk aged ≥ 1-yr-old (110 F: 40 M) by helicopter darting in a 5-Game Management Unit (GMU) study area (GMUs 520, 522, 524, 550, and 556) in the core of the Mount St. Helens elk herd area. Among the issues motivating our work were episodic high overwinter elk mortality, recent evidence of sub-par condition among elk translocated to the North Cascades in 2003 and 2005, and apparent elk herbivory impacts on plant communities in the vicinity of Mount St. Helens. In response to these issues and concurrent with the initiation of our work, antlerless elk harvesting was liberalized across several GMUs to reduce local elk densities.

Using ultrasound examination and body condition scoring we estimated mean ingesta free body fat (IFBF) for elk we live captured in February, 2009-2012, was 5.64% (95% CI = 5.08-6.21) for non-lactaters and 3.26% (95% CI = 2.34-4.18) for lactaters. These levels suggest food limitation. We found that GMU, lactation status, and pregnancy status affected IFBF, but year did not. Overall, 73 of 109 cow elk (67%) we examined for pregnancy via ultrasound were pregnant. Pregnant elk had higher IFBF than did non-pregnant elk. We also used organ samples from 364 hunter-harvested cow elk to estimate fall (Nov) IFBF for elk in the Mount St. Helens herd, 2009-2011. We detected effects of geographic subarea and lactation status on IFBF, but not effects attributable to year or cow age. IFBF was higher for cow elk harvested in GMU 560 and Columbia Gorge GMUs than from the managed forest portion of our 5-GMU study area. We estimated mean IFBF during the fall at 12.51% for non-lactaters and 10.84% for lactaters, controlling for other factors.

We collected data during intensive late winter helicopter surveys (2 complete survey replicates yearly 2009-2012, 1 survey in 2013) over the 5-GMU study area. We used data from Mar-Apr flights, 2006-2007 to fit logistic regression models to predict the sightability of elk groups based on group and environmental covariates. Several covariates influenced sightability in univariate logistic regression models. We then used multi-model inference and an information-theoretic criterion (AIC_c) to compare several alternative multivariate models of varying complexity; our results indicated the best multivariate model predicted sightability of elk groups based on: 1) transformed (log_2) group size, and 2) forest canopy cover (%). Predicted sightability increased with increasing group size and with decreasing cover.

We also used the logit-normal mixed effects (LNME) mark-resight model to generate estimates (2009-2012) of total elk population size and the sizes of the cow and branch-antlered bull subpopulations at a variety of spatial scales. We explored 11 LNME models to estimate total population size, 10 models to estimate total subpopulation sizes for cow elk and branch-antlered bulls, and 15 models to estimate GMU-specific estimates of cow elk abundance. We also used the Lincoln-Petersen model to generate mark-resight estimates for total population size and total cow elk subpopulation size for 2013 using data from the single survey conducted that year. We again used multi-model inference and AIC_c to evaluate the evidence in our data for the various models in our LNME model sets.

Sightability model estimates appeared to underestimate true abundance, relative to LNME estimates. This result is common and relates to how the 2 types of models account for undetected elk. Mark-resight models are virtually always more effective at accounting for such animals. However, trend estimates from the 2 modeling approaches were relatively congruent and time-specific estimates from both approaches were highly correlated, suggesting that sightability model estimates, although biased low, provided a useful and consistent abundance

index. The application of a sightability modeling approach is a much more practical strategy, relative to mark-resight, for large-geographic-scale monitoring such as is needed for elk at Mount St. Helens.

Sightability model and LNME mark-resight estimates, 2009-2013, suggested a decline in overall elk abundance and cow elk abundance; bull abundance estimates indicated a relatively stable bull population. We found evidence of strong spatial variation in the decline in overall elk abundance and cow elk abundance. Estimates indicated substantial a reduction in elk abundance in GMUs 520, 524, and 550. We did not detect any decline in GMU 522 elk abundance, nor in GMU 556 abundance; however, estimated elk abundance in GMU 556 during the last survey year that we report on, spring 2013, was the lowest we recorded across the 5 years of data from GMU 556. Across our individual counting units, the units the furthest west showed the most consistent and dramatic declines in raw elk counts; units further east in the same GMUs produced more stable counts.

For virtually every geographic scale of abundance estimates for total elk and total cow elk, the 2013 point estimate was the lowest estimate obtained 2009-2013, except for GMU 522 estimates. For total elk and total cow elk across the 4-GMU landscape (excluding GMU 522), 2013 estimated abundance was on the order of 30-35% lower than the 2009 estimates. GMU-specific sightability model estimates of total elk and total cow elk abundance were on the order of 60-70% lower in 2013 than in 2009 for GMUs 520 and 550, were ~40-60% lower for GMU 524, and were ~20-25% lower for GMU 556.

We also used radiomarked elk to estimate survival rates and explore possible sources of variation in survival. We explored 15 survival models with known-fate modeling using AIC_c and model weights to draw conclusions about Mount St. Helens elk survival during 2009-2013 (4 survival years). The best model had a common cow survival parameter for GMUs 520, 522, 524, and 556 that was constant during 2009-2011, a common cow survival parameter for all GMUs

during the last survival year (2012-2013), a unique survival parameter for GMU 550 cows during 2009-2011, and constant bull survival across years. Bull elk survival was estimated to be 0.56 (95% CI = 0.43-0.68). Annual cow survival was estimated to be 0.85 (95% CI = 0.78-0.91) during 2009-2011 in GMUs 520, 522, 524, and 556. During the same years, cow survival was estimated at 0.64 (95% CI = 0.48-0.78) in GMU 550. Cow survival in the final survival year (2012-2013) was estimated to be 0.52 (95% CI = 0.38-0.65) across all 5 GMUs. Low survival of radiomarked elk, 2012-2013, corresponded to a fairly high number of unmarked, winter-killed elk (*n*= 71) tallied during the annual mortality survey on the mudflow. During the previous 3 years, the annual winter mortality survey yielded tallies ranging 2-46 elk.

Spring calf recruitment varied considerably during 2009-2013. Calf:cow ratios exceeded 35:100 during 2010 and 2011. Calf recruitment was lower in the spring of 2009 and much lower in 2012, 2013. Overall, observed estimates were in the 25-30:100 range for the study area and in the 25-35:100 range for most GMU-specific estimates. After attempting to correct the observed ratios for fall removals of antlerless elk via hunter harvest, calf recruitment was indexed mostly in the high teens to 100 cows range for 2012, 2013 and in the 20-30-ish calves per 100 cows in 2009. Indexed recruitment in spring 2013 was the lowest—compared to other study years—for almost all GMUs. Depressed calf recruitment in the spring of 2013 corresponded to high mortality among radiomarked elk that same year, high observed overwinter mortality of unmarked elk, and elk abundance estimates that were also low.

Spring calf recruitment, 2009-2013, was strongly related to late summer-fall precipitation metrics (r^2 = 0.91-0.96); calf recruitment was higher in years with significant late summer-fall moisture, presumably because of enhanced forage production/quality during the time when calf elk are becoming increasingly dependent on foraging. Overwinter elk mortality, as indexed by the annual mortality survey on the mudflow, was strongly related (r^2 = 0.90) to a metric

reflecting daily snowpack during mid-to-late winter; in years with substantial late winter snowpack, overwinter mortality was higher than in years with milder winter conditions.

Collectively, our estimates of elk condition, productivity, and survival indicated fairly strong food limitation in this population that may have been a function of elk density. Attempts to reduce the elk population via liberalized hunter harvest beginning in 2007 were apparently successful, based on our estimates of elk abundance. However, links between weather covariates and recruitment and survival, coupled with a substantive overwinter mortality event, 2012-2013, suggest that reducing the elk density has not eliminated the risks of overwinter mortality, at least in the short-term. It is likely that plant community responses to lower elk herbivory are still evolving and benefits likely will take some time to be fully realized. We discuss the implications of both density-dependent and density-independent influences on elk demography and management in the Mount St. Helens elk herd. Our work did not address issues surrounding elk hoof disease, as these issues were beyond our research scope. The role of hoof disease in elk population processes at Mount St. Helens remains unclear, as does the degree that the condition's presence will complicate meeting management objectives.

INTRODUCTION

The Mount St. Helens elk herd is the largest of 10 formally recognized elk herds in Washington (Washington Department of Fish and Wildlife 2008). The herd occupies a large and diverse area of lowland and mid-elevation forest, interspersed with floodplains and valley bottoms in the southwestern part of the state. The herd name derives from the presence of the Mount St. Helens volcano, located near the center of the herd area. The volcanic eruption on May 18, 1980 devastated a large area occupied by elk, killing most elk in this impacted zone. Subsequently, as habitat recovery and restoration occurred, elk recolonized most of the area affected by the eruption (Merrill et al. 1987). This elk herd provides considerable elk-centered recreation, including elk hunting and wildlife-viewing. Because of the herd's history, because of the tourist appeal of the volcano, and because the herd area is bordered by developed corridors with sizable metropolitan populations, the Mount St. Helens elk herd is a high profile herd, featured often in local news media.

Over approximately the last 3 decades, elk habitat in areas affected by the 1980 eruption has evolved considerably, and the landscape carrying capacity for elk has been dynamic. Forage availability for elk appears to have peaked in the mid-to-late 1980s when early seral habitat was abundant and began to decline rapidly about the late 1990s as closed canopy forest conditions advanced. As habitat changed,

indications that the elk herd was becoming increasingly food-limited became evident. Among the most dramatic indicators of the change in elk habitat quality, was the appearance of substantial episodic winter mortality events that began in the late 1990s and widespread evidence of strong herbivory effects on plant communities used by elk. The winter mortality events were most apparent on the floodplain of the North Fork of the Toutle River, an area that remains substantially impacted by the 1980 volcanic lahar.

For elk management to be appropriately responsive to dynamics in the availability and quality of elk habitat requires: defensible information on elk abundance, a fundamental understanding of basic elk vital rates (*i.e*., mortality and productivity) and how these are affected by habitat dynamics, and how systematic changes in habitat structure and composition affect the spatial and temporal availability of elk habitat components, especially forage. Historically, surveys of elk at Mount St. Helens were focused on generating ratio data (calves:100 cows and bulls:100 cows) to monitor juvenile recruitment and bull harvest effects. Previous efforts to use these data to model elk abundance were largely unsuccessful (Miller and McCorquodale 2006). Data on Mount St. Helens elk vital rates are available from the recolonization phase dating to the 1980s (Merrill et al. 1987), but more recent estimates of elk vital rates were lacking as of the mid-2000s. In light of these data limitations, we undertook a study in 2009 to: *1) develop a practical approach to monitoring Mount St. Helens' elk abundance; 2) generate defensible estimates (or indices) of recent and current elk abundance; and 3) evaluate physical condition and vital rates of a representative sample of elk from the population*.

Our efforts focused on a subarea of the core herd range where habitat dynamics have been the most dramatic in the last 3 decades and where periodic overwinter elk mortality has been prevalent. Our work did not directly focus on documenting habitat conditions, forage availability, or herbivory because concurrent work by the Weyerhaeuser Company, researchers with the National Council for Air and Stream Improvement, and a graduate student at the University of Alberta were concurrently researching these issues.

STUDY AREA AND BACKGROUND

The Mount St. Helens elk herd area covers much of southwest Washington, east of Interstate 5 (Fig. 1), and during our work, consisted of 14 Game Management Units (GMUs) defining 5 Population Management Units (PMUs). This large area (≈ 4,710 mi^2) extends north to south from almost south Puget Sound to the Columbia River Gorge and west to east from I-5 to US Highway 97 (more than 40 miles east of the Cascade Crest). The scale of the defined herd area made it impractical to serve as a formal study area, so we selected a 5 GMU core area as our study area; the GMUs we selected were: Winston (GMU 520), Loowit (GMU 522), Margaret (GMU 524), Coweeman (GMU 550), and Toutle (GMU 556) (Fig. 1). These GMUs represent a large swath of the herd's core range, including an extensive area of industrial and state-

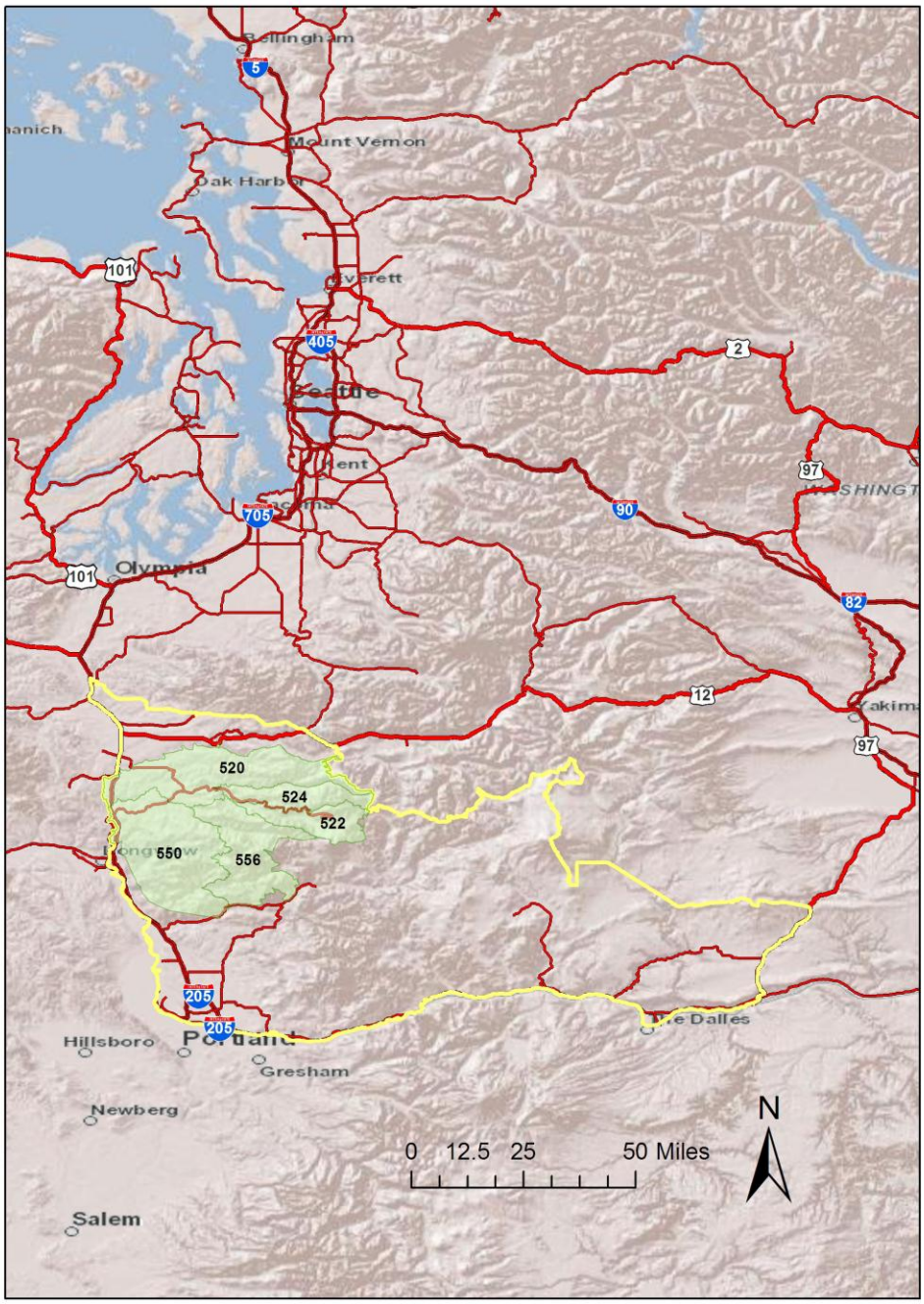

Figure 1. Map of the Mount St. Helens elk herd area (yellow outline) and the core study area (green shaded, with GMU numbers).

managed forest, as well as that part of the landscape still impacted by the 1980 eruption of the volcano (North Fork of the Toutle River and the Mount St. Helens National Volcanic Monument). This area has historically supported the highest elk density, much of the historic recreational elk hunting, and includes the area presenting the most complex management challenges (*e.g.*, hunter access, elk effects on industrial forestry and plant succession, and episodic winter elk mortality on the mudflow). The exception to this spatial extent for our work was for fall sampling of organs from hunter-killed elk (see Methods below); we solicited and analyzed organ samples from additional GMUs within the herd area boundary (*i.e.*, the Columbia Gorge and Cascade GMUs).

Physiographically, most of the herd area is within the Southern Washington Cascade Province, except for the western-most portion, which is within the Puget Trough Province (Franklin and Dyrness 1973). Elevations within the study area ranged from approximately 6 meters above mean sea level (AMSL) to 2,535 meters AMSL at the crest of the volcano. The western portion of the study area consisted of relatively flat and gently rolling terrain, whereas steep, rugged topography characterized the eastern portion. Historically, the area was covered by dense coniferous forests, but urban, suburban, and agricultural development has converted much of the lowland area into a relatively open landscape. Most of the upland foothills and mountainous terrain remain dominated by coniferous forest, much of it managed for commercial timber products. Three major forest zones occur in the study area: the western hemlock (*Tsuga heterophylla*), Pacific silver fir (*Abies amabilis*), and mountain hemlock (*Tsuga mertensiana*) zones (Franklin and Dyrness 1973). Douglas-fir (*Pseudotsuga menziesii*) is a naturally occurring co-dominant tree in the western hemlock zone, and is typically promoted in second growth forests because of the high commercial value of this fast-growing conifer. Timber harvest on industrial lands and some state lands has historically been by clearcutting. Forest management has produced a distinctive and extensive mosaic of recent clearcuts and second growth stands of various ages.

The Mount St. Helens elk herd area was dramatically transformed by the May 18, 1980 volcanic eruption that impacted 600 km^2 of the area north, northeast, and northwest of the crater. The eruption killed an extensive area of conifer forest and

resulted in extensive (c. 4 billion board feet) blow-down (Frenzen and Crisafulli 1990, Franklin et al. 1995). Ash, debris, and/or mudflow covered much of the blast zone initially, but vegetative recovery in less-impacted areas proceeded rapidly. However, natural recovery has been slow and incomplete in areas nearest the crater and along the North Fork of the Toutle River (Wood and Del Moral 1988, Del Moral and Wood 1988, Del Moral and Wood 1993, Del Moral 1998, Lawrence and Ripple 2000). The principal industrial forest landowner, Weyerhaeuser, was substantially impacted by the eruption due to widespread loss of high value timber. Subsequently, the company invested extensively in salvage logging and reforestation to restore its lands to production.

In the nearly 30 years between the eruption in 1980 and the beginning of our study in 2009, much of the impacted landscape has returned to the typical appearance of a western Washington managed forest landscape, with little evidence of the 1980 cataclysm. Much of this recovery was promoted by active forest management (Franklin et al. 1995). However, dramatic evidence of the eruption is still visible on the highly erosive North Fork of the Toutle River, where a large matrix of rock, gravel, and ash covers much of the floodplain, with patchy “islands” of meadow-like prairie and stands of pioneering red alder (*Alnus rubra*) interspersed. The headwaters of the North Fork, the pumice plain, and the flanks of the crater have remained largely untouched by post-eruption management and still bear evidence of the devastation that occurred in 1980. This area has been allowed to recover under natural processes, and in 1982, 445 km^2 were federally designated as the Mount St. Helens National Volcanic Monument, which is administered by the U. S. Forest Service. Some limited recreation occurs within the monument, but the natural character of the area is emphasized and protected as a management priority.

The climate of the study area is Pacific maritime, with cool, wet winters and relatively dry summers. Annual precipitation has typically ranged 160-400 cm (63-157 inches) in recent decades, with most of the annual precipitation falling between October and April. Winter snowfall is common, varies considerably across years, and at higher elevations persists for much of the winter (Fig. 2). During and just previous to our study,

cumulative daily snow depth at the Spirit Lake SNOTEL site (1,067 meters; USDA Natural Resources Conservation Service) was greatest for December 2007 and December 2012, intermediate in December 2008 and 2010, and lowest in December 2009 and December 2011 (Fig. 3). By March, cumulative daily snow depth was greatest in 2008, intermediate in 2009, 2011, 2012, and 2013, and lowest in 2010. Winter 2009-2010 was very snow-free compared to the other winters at the Spirit Lake site (Fig. 3). At a lower elevation (648 m) SNOTEL site (Pepper Creek) just south of the study area, cumulative daily snow depth in December was greatest in December 2007 and 2008, intermediate in December 2010 and 2012, and lowest in December 2009 and 2011 (Fig. 3). By March, cumulative daily snow depth at this lower site was greatest in 2008, slightly lower in 2009, intermediate in 2011, 2012, and 2013, and lowest in 2010 (Fig. 3). At the Pepper Creek SNOTEL site, the winter of 2009-2010 had little accumulated snow, whereas the winter of 2007-2008 was severe relative to snowfall.

Figure 2. Winter snowfall was common in the study area and often persisted for several months in the higher elevation portions of the elk range each year.

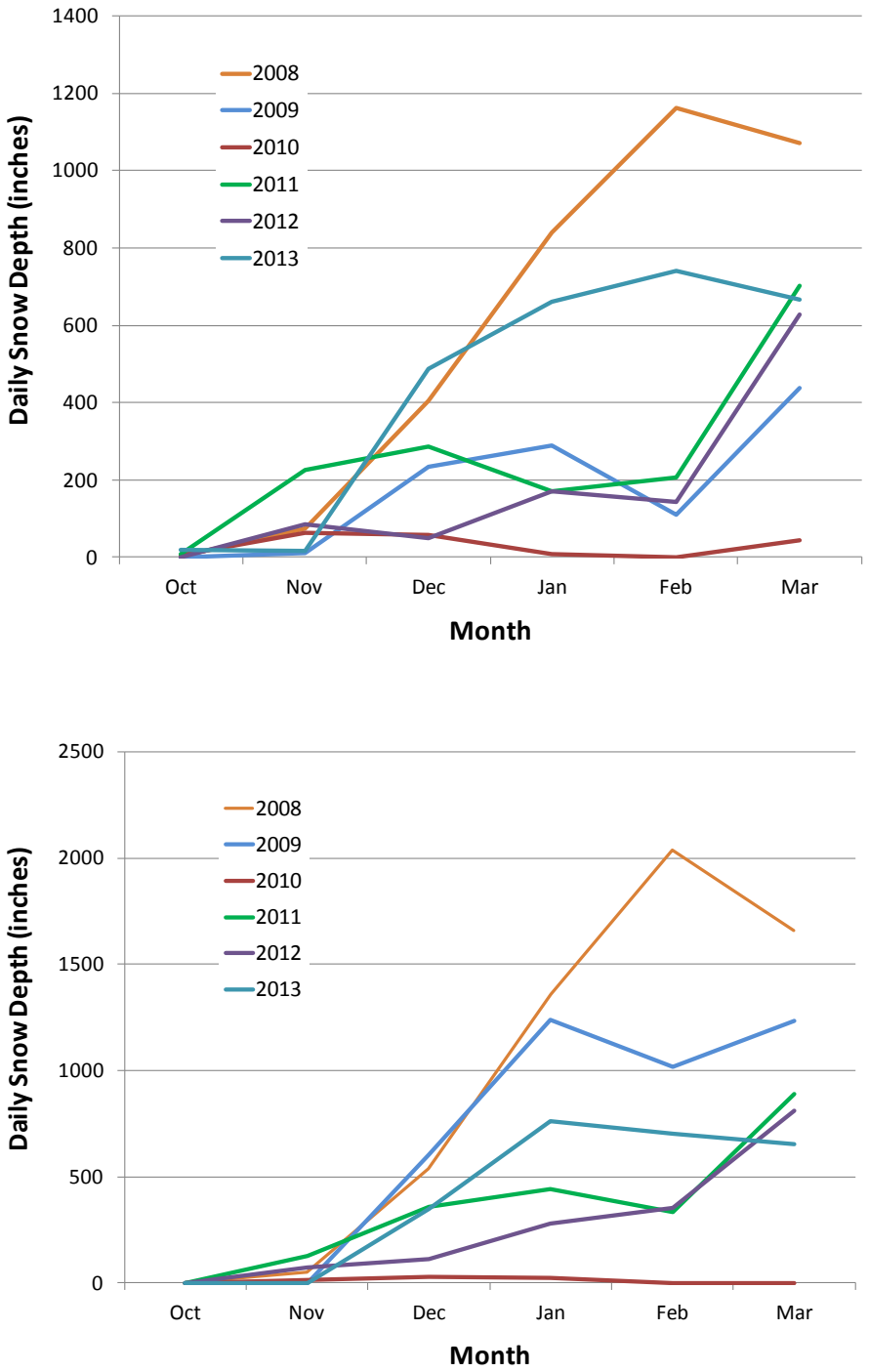

Figure 3. Cumulative daily snow depth (by month) for water years 2008-2013, from the Spirit Lake (upper panel; elevation = 1,067 m) and Pepper Creek (lower panel; elevation = 648 m) SNOTEL sites. A water year spans October 1 – September 30, and is labeled by the calendar year in which it ends.

Spring/summer/early fall precipitation, measured at the Spirit Lake SNOTEL site, was greatest in 2010 and 2012, lowest in 2007 (just prior to our study), and intermediate in all other years (Fig. 4). Early fall precipitation occurred in most years, but was largely absent in 2012 and minimal in 2011 (Fig. 4). Not only was 2010 the wettest summer, it was also the wettest fall, evidenced by the slope of the late August to mid-September cumulative precipitation line (Fig. 4).

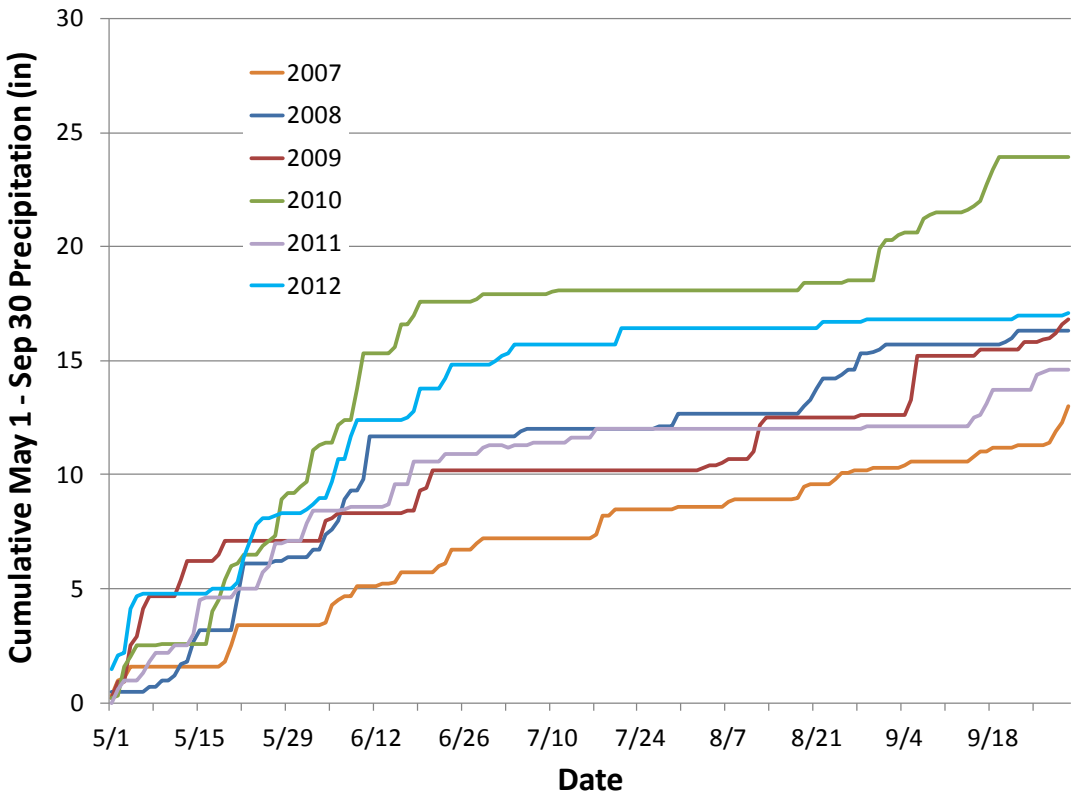

Figure 4. Cumulative spring-summer precipitation measured at the Spirit Lake SNOTEL site (elevation = 1,067 m), 2007-2012.

Land ownership in the Mount St. Helens elk herd area is relatively evenly split between public and private ownership (Miller and McCorquodale 2006). Much of the forested eastern portion of the area is federally managed as part of the Gifford Pinchot National Forest and includes several formally designated wilderness areas. WDFW and

the Washington Department of Natural Resources (WDNR) also own and manage lands within the herd area. Large tracts of industrial forest dominate the western portion of the herd area occupied by elk; the Weyerhaeuser Company manages the largest area of corporate forest. The developed portions of the landscape (*e.g.*, valley floodplains, populated corridors along Interstate 5 and the Columbia Gorge, agricultural lands) are also in private ownership. Our core study area mostly encompassed corporate forest land, but included small tracts of WDFW and WDNR lands, as well as very small parcels of other private land. The only federal land within our core study area was the Mount St. Helens National Volcanic Monument tract.

Elk Habitat

Prior to the 1980 eruption, elk habitat in the western half of the Mount St. Helens elk herd area was typical of western Washington elk habitat. Early seral habitat, preferred by foraging elk, was maintained principally by clearcut logging on private, state, and federal forests (Witmer et al. 1985). Forest management created a diverse mosaic of stand ages that served to maintain quality elk habitat at both small and large scales throughout this region (Starkey et al. 1982, Witmer et al. 1985, Jenkins and Starkey 1996). Simulation modeling suggested forage availability for elk likely peaked in the 1960s region-wide and declined through the 1970s and 1980s based on forest harvest patterns (Jenkins and Starkey 1996), but forage availability for elk at the end of this time series was still likely higher than it had been in the first half of the 20th century.

The volcanic eruption altered the habitat mosaic for elk by killing vegetation in virtually all stands, regardless of age, and across habitats in about 600 km^2 of southwest Washington (Fig. 5). As previously described, in the 30 years between the eruption and the beginning of our study, the managed forest mosaic was largely recreated on the landscape (Fig. 5), albeit with a truncated distribution of stand ages in the original blast zone.

The regional dynamics of elk habitat values have also been strongly affected by forest management policy across ownerships in recent decades. An emphasis on conservation of older forest conditions on federal lands led to a dramatic decline in timber harvesting about 1991 on national forests in western Washington and Oregon,

with a resultant decline in the availability of early seral stands important to elk on federal forests (Hett et al. 1978, Salwasser et al. 1993, Adams and Latta 2007). Since that time, the creation and maintenance of early seral elk habitat at larger scales has been largely limited to privately owned forests of the region (Adams and Latta 2007) (Fig. 6).

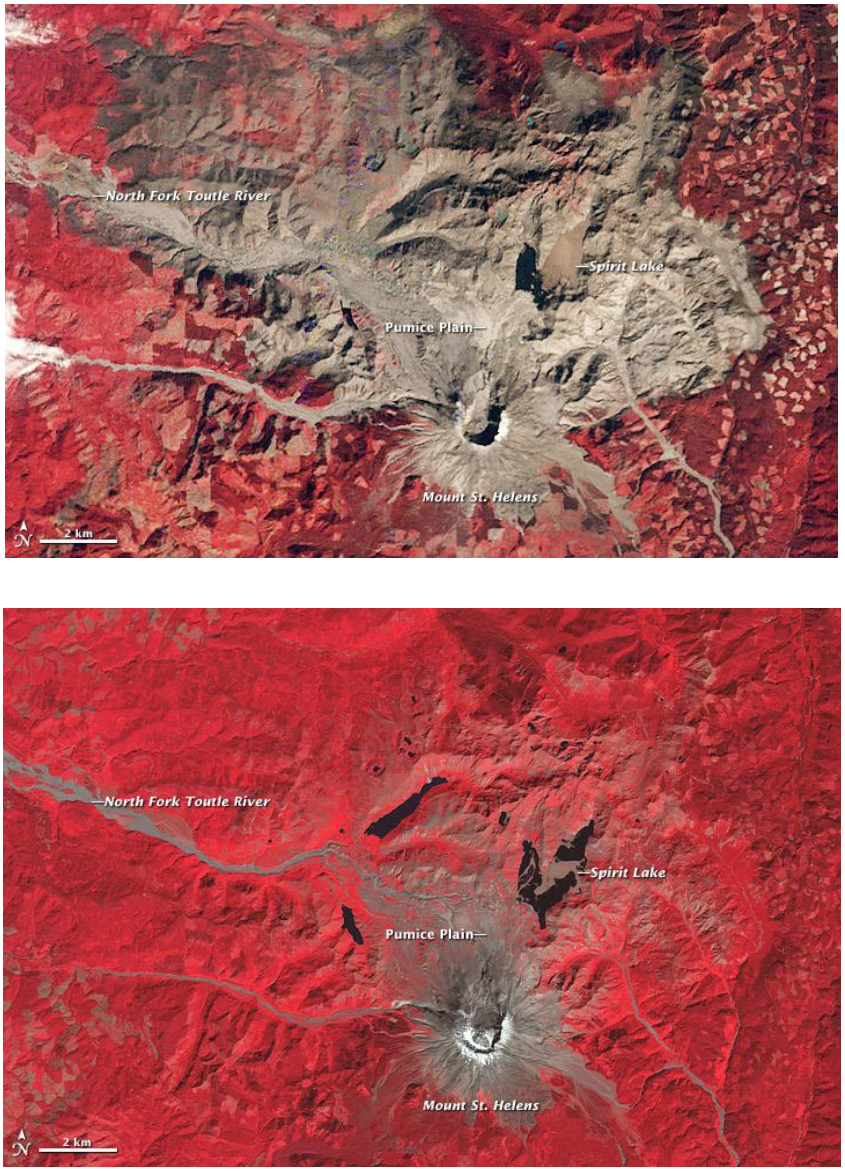

Figure 5. Infrared satellite images of the Mount St. Helens vicinity early post-eruption (top image, 1980), and nearly 30 years post-eruption (bottom image, 2009). In these images, vegetated areas (*e.g.*, forest, grassland, vegetated clearcuts) are red/pink, and bare ground, ash, mudflow, etc. are gray/brown (images courtesy of NASA's Earth Observatory Program).

Figure 6. Typical corporately managed elk habitat mosaic within the core study area (GMU 550 [left] and GMU 556 [right]).

Overwinter Elk Mortality

Since the spring of 1999, the Washington Department of Fish and Wildlife has conducted a winter elk mortality survey on about 4 km^2 of the floodplain of the North Fork of the Toutle River where substantial overwinter mortality has been periodically observed. This survey is conducted about late April each year and consists of a team of approximately 30-40 WDFW staff and volunteers walking transects through the entire sampling area, which consists mostly of the WDFW-owned Mount St. Helens Wildlife Area. The survey is used to provide an *index* of annual overwinter elk mortality, not an *estimate* of total overwinter mortality, given the limited spatial extent of the survey. During the survey, elk mortalities observed are examined for approximate death timing (recent [days old] vs. older [weeks to months old]), a femur is sectioned to document bone marrow condition (white and firm, red and runny, or desiccated), and GPS coordinates are taken to geospatially reference the site. The cumulative GPS dataset, as well as the presence or absence of cut femurs, is used to discriminate current year mortalities from those dating to a previous year.

The numbers of winterkilled elk observed during the annual transect survey has varied considerably across years (0-158) (Fig. 7). The highest count (*n* = 158) occurred at the end of the winter prior to our study (April 2008). During our study, winterkilled elk were detected each year; very few mortalities (*n* = 2) were tallied in spring 2010, but numerous dead elk were detected in most other years. In 2013, the 71 winterkilled elk detected was the third highest count observed since the surveys began in 1999.

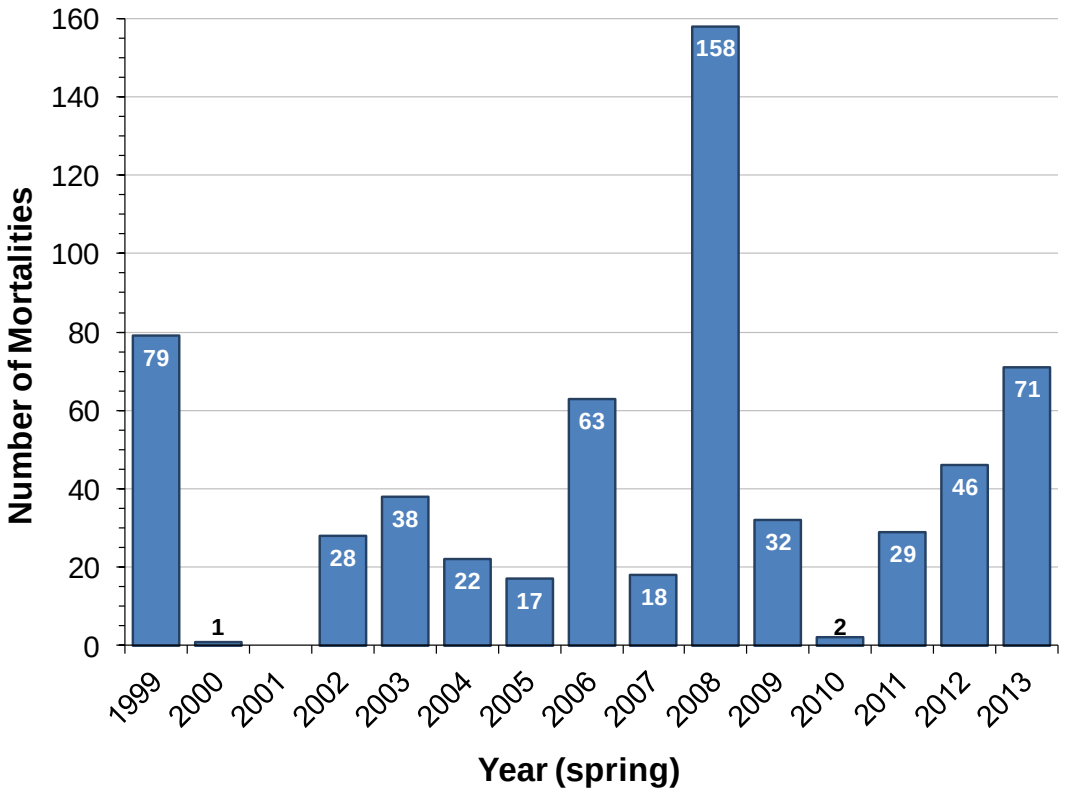

Figure 7. Number of current year overwinter elk mortalities tallied during the annual mortality survey on the Mount St. Helens Wildlife Area, April 1999-2013.

Elk Population Management

The management history for the Mount St. Helens elk herd has been documented in detail in the Mount St. Helens Elk Herd Plan (Miller and McCorquodale 2006), including season structures, season lengths, and hunter participation levels, by GMU, in recent decades. As is typical in elk management, most recreational hunting opportunity has historically been supported by bull elk general seasons in the Mount St. Helens elk herd area. A variety of season structures have been used to manage the general bull harvest, including any bull seasons, spike-only seasons, and ≥ 3-point seasons, across years and across GMUs. To support a diversity of hunting experiences, some GMUs in the Mount St. Helens herd area have been periodically designated as permit-only elk units with no general season elk hunting.

During our study, general bull seasons (≥ 3-point) were in place in GMUs 520 and 550. Permit only seasons governed bull elk hunting in GMUs 522, 524, and 556. Also during our study, all antlerless elk hunting was by permit only seasons across our study area GMUs, except that general antlerless elk seasons for archery hunters existed in GMUs 520 and 550. Density manipulation in elk populations is typically accomplished by varying the numbers of antlerless elk permits to achieve a desired cow elk harvest. During the period from the post-eruption, elk recolonization through the mid-2000s, antlerless elk hunting in the core GMUs of the Mount St. Helens herd was managed fairly conservatively to promote population stability and/or growth, outside of areas where elk damage issues existed. In response to the overwinter elk mortality issue, however, antlerless elk permits were liberalized in 2007, and even further liberalized in 2011 (Fig. 8), to reduce the local elk density and bring it into better balance with available habitat in the herd's core GMUs (Miller and McCorquodale 2006). The liberalization of antlerless elk permitting, 2007-2012, yielded the intended increase in antlerless elk harvest (Fig. 9). Qualitatively, the elk antlerless harvest, 2004-2012, has the same step-like appearance as the antlerless elk permit levels did during the same timeframe (Figs. 8, 9), with increased harvest of antlerless elk occurring each time permit levels increased.

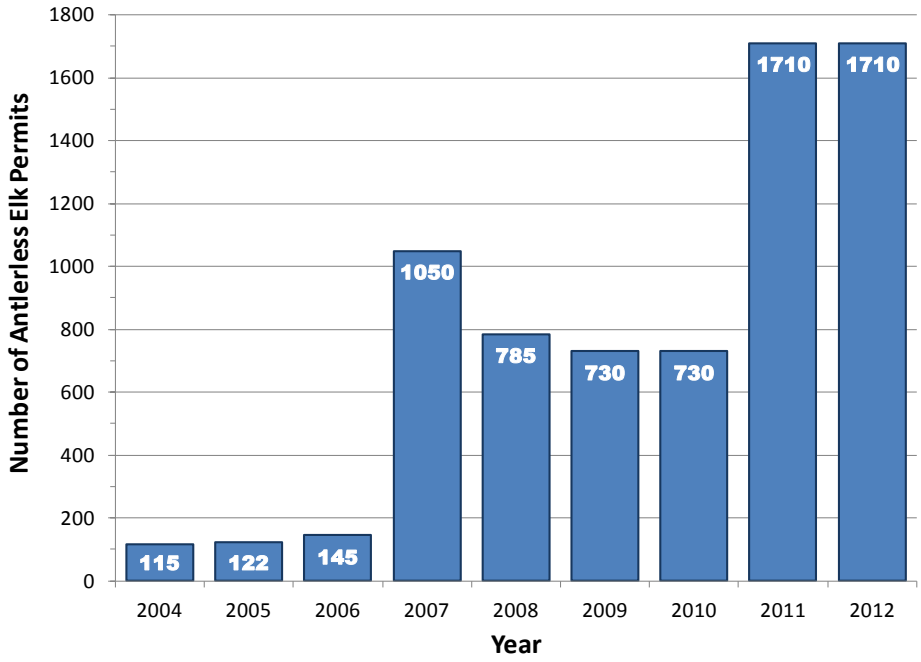

Figure 8. Numbers of antlerless elk permits issued, 2004-2012, for GMUs 520, 522, 524, 550, and 556, collectively.

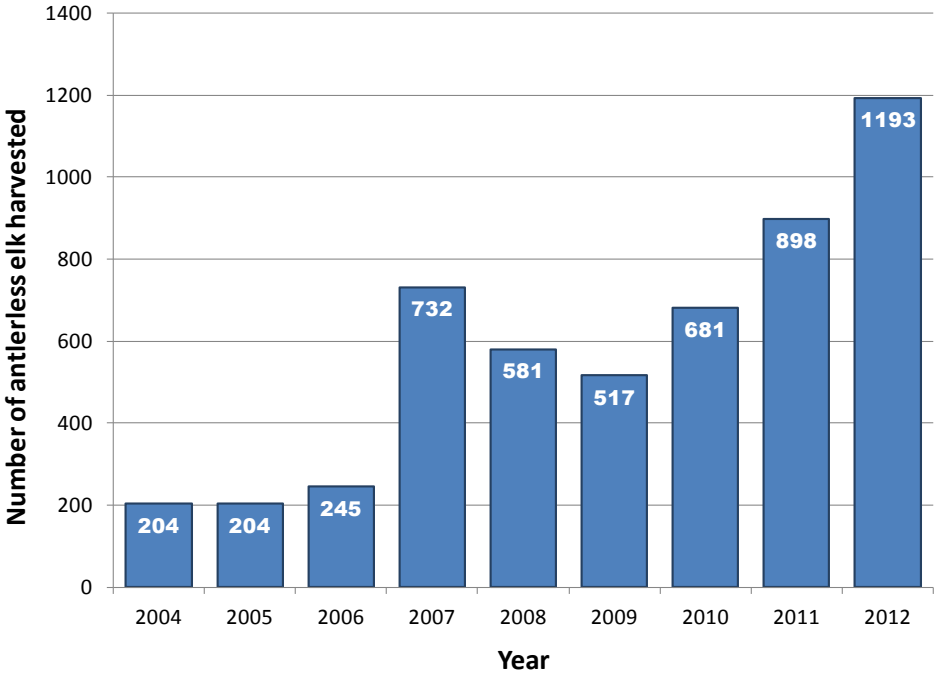

Figure 9. Numbers of antlerless elk killed, 2004-2012, in GMUs 520, 522, 524, 550, and 556, collectively.

METHODS

Marking and Handling

We captured adult and yearling cow elk and branch-antlered bull elk by darting them with a carfentanil citrate / xylazine hydrochloride mixture from a Bell 206 Jet Ranger helicopter. Captures occurred in February each year, 2009-2012. We ear-tagged elk we captured with colored and numbered plastic livestock tags. We fit most elk with 148-150 MHz, Very High Frequency (VHF) radiocollars (Telonics [Mesa, Arizona, USA]), but some received GPS-equipped radiocollars (Telonics or Lotek [Newmarket, Ontario, Canada]). All radiocollars had motion detectors that served as mortality beacons. We extracted a single vestigial upper canine from each elk to estimate age via cementum annuli analysis (Matson's Lab, Milltown, MT, USA), and we gave each elk a short-acting, prophylactic injection of penicillin, banamine, and an anti-clostridial to reduce risks of post-capture complications, such as dart wound infections. We also measured each elk's chest girth with a flexible tape measure to later estimate body mass. After handling, we reawakened immobilized elk via injections of the narcotic reversal, naltrexone hydrochloride and the xylazine reversal, yohimbine

hydrochloride. After we administered reversal drugs, elk were generally alert and ambulatory within 1-7 minutes.

Body Condition and Reproduction

We estimated late winter (mid-February) ingesta-free body fat (IFBF) percentage from data we collected for adult cow elk during each capture event. We collected data and generated IFBF estimates following Cook et al. (2010). The basic data were: 1) body mass (kg; estimated via chest girth), 2) maximum subcutaneous rump fat depth (cm; measured using a portable ultrasound unit), and 3) a palpated body condition score (BCS = 0-5) measured at the rump (*i.e*., prominence of sacral ridge and prominence of the sacro-sciatic ligament) (Cook et al. 2010). We also determined pregnancy status for each captured cow elk via ultrasound and visually examined and palpated each elk's udder to verify their lactation status: non-lactater (dry), true lactater (milk), or post-lactater (clear fluid).

We also quantified yearling and adult cow elk body condition during fall, 2009-2011, using modified Kistner subset scoring (Kistner et al. 1980, Cook et al. 2001*b*) applied to internal organs collected from hunter-killed elk. We visually scored (*i.e*., 1-20) the extent of organ fat deposition associated with the heart, pericardium, and kidneys (Fig. 10) using standardized reference photos and calculated an estimated IFBF for each sampled cow elk using the equations of Cook et al. (2001*b*). We solicited these organs from antlerless-elk permit holders each year via mail requests and field contacts; hunters were asked to deposit organ samples at several collection stations we established each fall across our study area. Hunters were also asked to submit 2 middle incisors from their harvested elk for age determination via cementum annuli examination (Matson's Lab, Milltown, MT); they were also asked to report observed lactation status (*i.e*., udder was dry, had milk, or had clear fluid). Organ samples were frozen promptly after field retrieval for subsequent scoring each winter at the Cowlitz Wildlife Area Headquarters. Scoring was done each year on a single day using a team-scoring approach to maximize scoring consistency within and across years.

Figure 10. Elk organs from hunter-harvested cow elk used to estimate fall body fat (%IFBF) for Mount St. Helens elk, 2009-2011 (left to right: pericardium, heart, kidneys).

Sightability-Correction Modeling

We developed and evaluated sightability correction models for late winter-early spring helicopter surveys in our 5-GMU core study area by collecting data from sighted and unsighted groups of radiomarked elk, Mar-Apr 2009-2011. We initially delineated 19 sampling units that were 16.8-62.7 (mean = 31.0) km^2 (Fig. 11). We selected sampling unit sizes such that a unit could generally be flown without having to refuel the helicopter, except for the mudflow unit (GMU 522). Two units never contained a radiomarked elk and also yielded very few unmarked elk observations, so we rarely flew these units because of a low benefit-to-cost ratio. For all other units, we flew each twice per winter during weeklong survey periods that were separated by 1-2 weeks, providing spatial and temporal replication.

We verified the distribution of radiomarked elk among our sampling units prior to a survey by flying just off the perimeter of each unit with the telemetry-equipped survey helicopter, being careful to not gain specific information about the location of elk within the units. Crews conducted initial visual surveys and telemetry-assisted follow-up in each sampling unit from a *Bell 206 Jet Ranger* helicopter. The crew of the survey helicopter generally had information on the distribution of radiomarked elk among counting units, but did not know the exact locations of these elk. We flew adjacent units consecutively where movement of elk across sampling unit boundaries was anticipated, based on previous telemetry data. The helicopter crew consisted of the pilot and 3

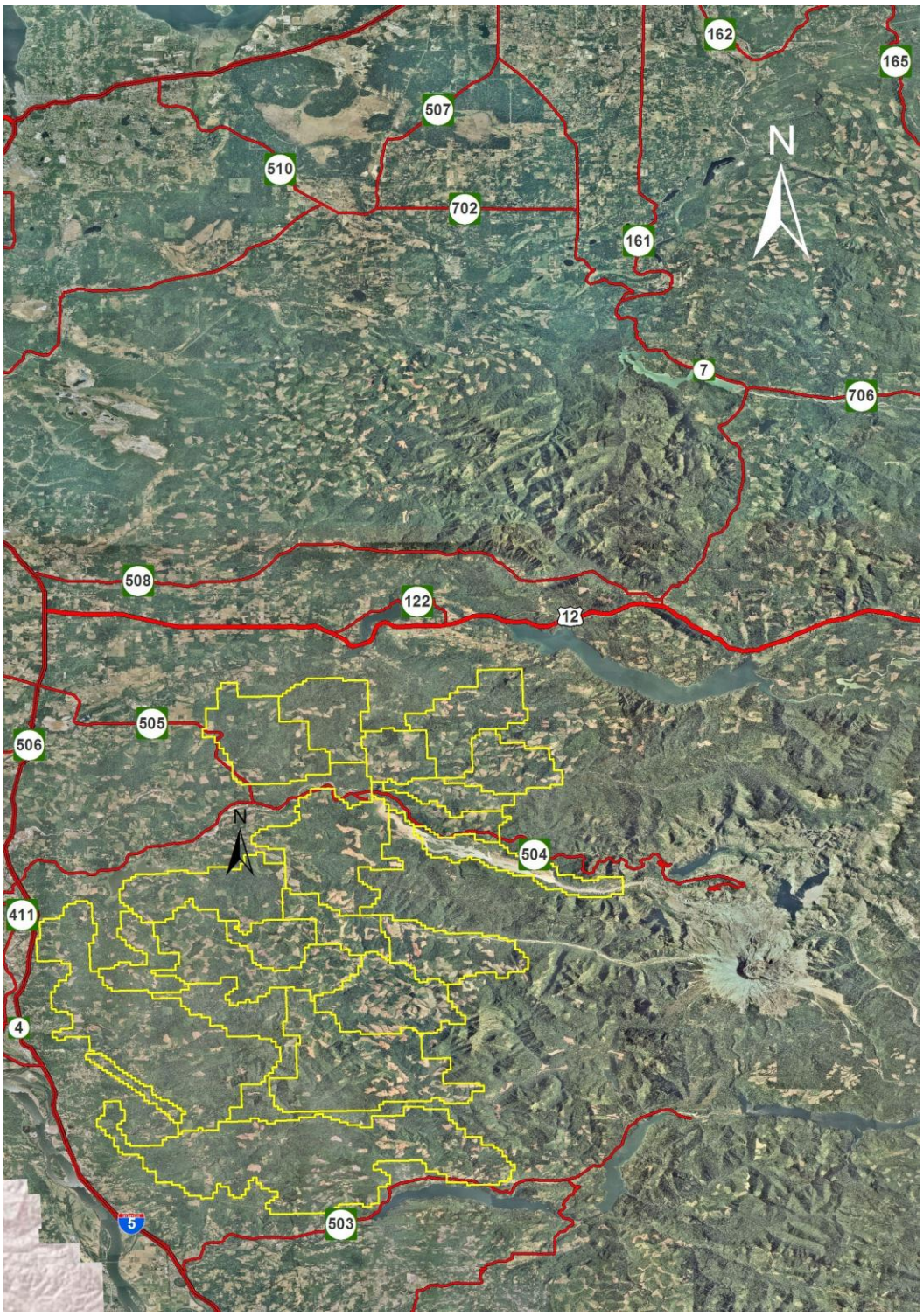

Figure 11. Initial delineation of counting units used for spring helicopter surveys and sightability modeling, 2009-2013, Mount St. Helens elk herd study area.

observers. The primary observer sat abreast the pilot and also recorded data; the 2 additional observers sat abreast, in the back seat of the aircraft. One backseat observer assisted in navigation and maintaining flight line protocols by following a GPS track log on a laptop computer. The helicopter was equipped with a single, forward-looking VHF telemetry antenna and a receiver that allowed radiomarked elk to be relocated and/or identified when needed during the data collection flights, as described below.

We conducted visual surveys of the counting units initially with the helicopter's telemetry system inactivated. We surveyed the counting units at an altitude of 40-70 m above-ground-level (AGL), flying at 80-120 km/hr. Because of the extensive size of the defined survey area, it was impractical to systematically survey the entire area with evenly spaced flight transects, as is typical for sightability surveys (Samuel et al. 1987, McCorquodale et al. 2013). Because a substantial part of the survey area was typified by habitat with predictably low elk sightability (*e.g*., high canopy closure regeneration stands and older conifer forest), our approach focused on flying a high proportion of the landscape where elk detection probabilities would be expected to be modest to high (*e.g*., clearcuts, young regeneration stands, leafless alder stands). In this way, we maximized efficiency by flying where we had some real chance of seeing elk and avoiding areas where sighting elk was very unlikely. This strategy was based on a fundamental goal of maximizing our ability to count as many elk as possible in the survey area, within the constraints of available time and financial resources.

The helicopter crew scanned for elk groups out of both sides of the helicopter. When a crewmember sighted an elk group, the pilot deviated from the flight line and circled the group while the crew collected the following covariate data: group size (GRP), activity of the first elk sighted (ACT: bedded, standing, or moving), percent canopy closure characterizing the area immediately around the group (CAN), percent snow cover (SNOW), cover type (COV) as a categorical variable (opening, clearcut, regenerating conifer stand, alder, conifer forest, or mixed hardwood/conifer forest), and lighting (LIGHT: flat vs. bright). The crew had graphical depictions of various canopy

closure settings available for reference. We recorded CAN and SNOW as quantitative covariates, in increments of 5%. We also recorded GPS waypoints for all elk groups.

Crews also scrutinized sighted groups for the presence of radiomarked elk (Fig. 12) and recorded the composition of the groups (*i.e*., the numbers of adult cows, calves, yearling bulls, subadult bulls [raghorns = 2-3 yr-olds], and mature bulls [robust antlers ≥4 yr-olds]). If radiomarked elk were sighted in a group, the telemetry system was activated, and the crew identified all radiomarked elk present. We took digital photos of larger groups (≥ 30 elk) and later verified group size and composition from these photos. After we collected data for each sighted group, we deactivated the telemetry system if it had been used to identify collared elk, the pilot repositioned the helicopter back onto the original flight line, and we resumed the survey protocol.

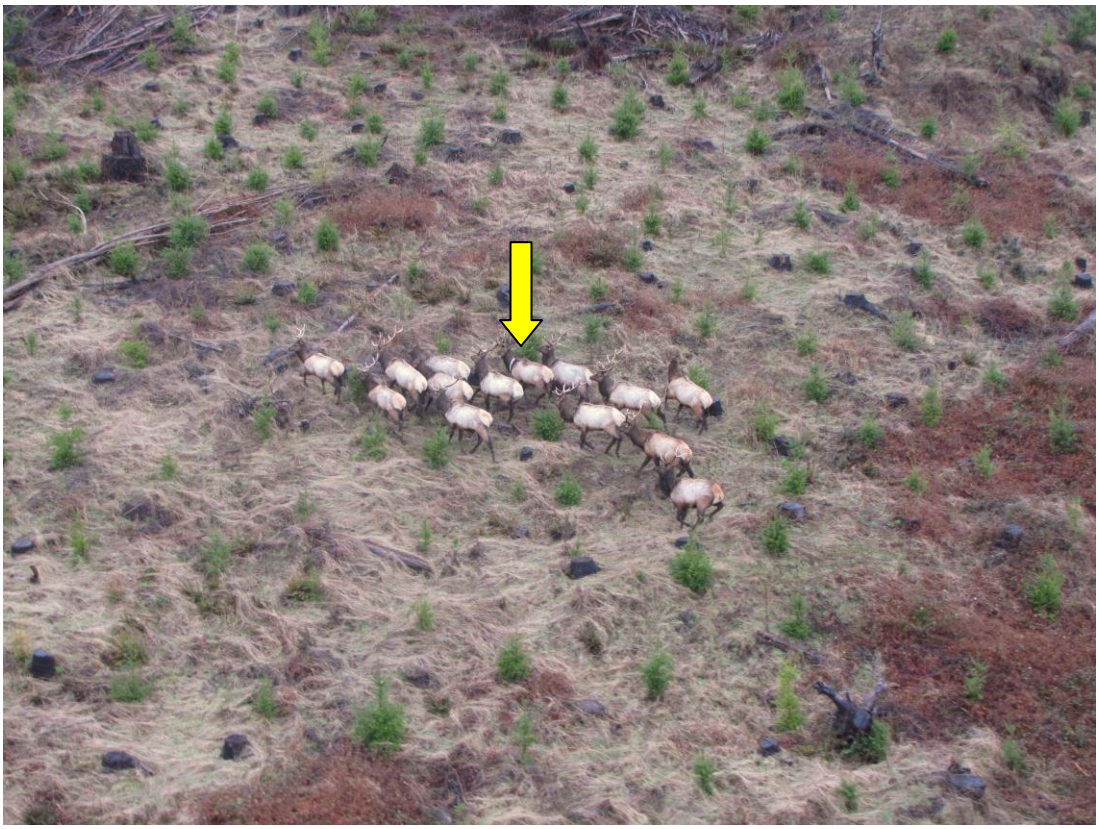

Figure 12. Bull elk group sighted during one of the helicopter surveys; yellow arrow indicates position of a radiomarked bull in the group.

When we had finished surveying a counting unit and had collected data for all sighted groups, we reactivated the telemetry system aboard the helicopter to facilitate locating elk groups containing radiomarked elk that we had missed during the visual survey. We located all missed radiomarked elk precisely via telemetry and collected the same data for these groups that we had collected for sighted groups. When these missed groups were located in heavy cover, the pilot homed to the radio signal and maneuvered the aircraft in low concentric circles over the radiomarked elk's location while the crew carefully watched for elk movement. Often, the pilot was able to haze these groups into sparser cover where the crew could enumerate and classify them. Sometimes, groups in the heaviest cover could not be completely counted or estimated with confidence, and these instances resulted in *missing data* for the GRP covariate. We also recorded GPS waypoints for all groups that had been missed, but were subsequently located via telemetry.

We modeled the sighting process as a binary response (*i.e*., 1 = sighted group, 0 = missed group) using logistic regression (Hosmer and Lemeshow 1989), employing group and environmental covariates as potential predictor variables. Modeling was based only on radiomarked groups (*i.e*., we recorded data from sighted groups that did not contain radiomarked elk, but did not use those data to model sightability). For groups that had missing values for the GRP covariate, we substituted the median group size from all groups we had confidently counted, but limited the data to groups missed in forested habitats (elk groups on the mudflow tended to be larger than groups observed in forested uplands). We also evaluated a transformed GRP covariate (LG2GRP = $\log_2$[GRP]) because we thought it was more reasonable for the effect (*i.e.*, odds ratio) of group size to be constant as group size doubled rather than as it increased by 1 elk across an array of group sizes. For modeling sightability, we also derived a covariate reflecting the dominant gender of the group (SEX). We initially used univariate logistic regression (*i.e*., models with only an intercept and a single predictor variable) to identify which predictors were systematically related to the sighting trial outcome (sighted vs. missed). We also tested for collinearity among predictors. We then brought forward those predictor variables that were related to sightability and

conceptualized several alternative models of varying complexity reflecting logical combinations of covariates potentially affecting the sightability of elk groups during helicopter surveys. Where collinearity existed among covariates, we selected one covariate for inclusion in the multivariable models. We used Akaike's Information Criterion, adjusted for small samples (AIC_c) to assess model support and used model averaging to derive final coefficient estimates and their unconditional standard errors (Burnham and Anderson 2002).

In the spring of 2012 and again in 2013 we flew our surveys as we had done during 2009-2011, except that we ceased to relocate missed radiomarked elk, and we flew only 1 survey session in 2013; therefore, we did not use data from sighted groups in 2012 and 2013 as sightability modeling data because it was inappropriate to include data that could only come from sighted groups. We subsequently used the data collected for sighted groups only for all years, 2009-2013, to generate estimates of population size using the best-supported sightability model. These data included the data used to develop the sightability model (*i.e*., 2009-2011) and non-model-building data (*i.e*., 2012-2013). We derived abundance estimates and their 95% confidence intervals using the R (R Core Development Team 2008) package *Sightability Model*, following Fieberg (2012). We generated estimates of total elk abundance from each survey replicate, as well as separate estimates for adult cow abundance. We generated these estimates for both the full 5-GMU landscape and for each of the 5 GMUs separately. To estimate abundance, we used only data from the survey units we flew on every survey replicate (*i.e*., we omitted data from the 2 units described above that were flown only occasionally).

Mark-Resight

Among available mark-resight estimators that are robust to heterogeneity of resighting probabilities across individuals within resighting occasions, we chose the maximum-likelihood based *logit-normal mixed effects* (LNME) model (McClintock et al. 2008). The likelihood for the LNME model formally estimated population size (N_j); it also generated MLEs for detection probability (p_{ij}) and the variance (σ_j^2) of a random

individual heterogeneity effect, where the subscript *j* refers to primary occasions (year) and *i* to secondary occasions (survey) within a primary occasion (McClintock et al. 2008). In the absence of individual heterogeneity, the parameter p_{ij} is interpreted as the overall mean detection probability, but when heterogeneity > 0, overall mean detection probability is estimated under the LNME model as the derived parameter μ (McClintock 2008), which we report. The parameter μ is derived as a function of p_{ij}, σ_j^2, and ε_{ij} (number of marked animal encounters, where identity was not determined).

We implemented the LNME model in Program MARK (White and Burnham 1999), which allowed us to compare alternative model parameterizations that embodied hypotheses about sources of variability affecting LNME abundance estimates (McCorquodale et al. 2013). We coded 3 separate encounter history datasets for the LNME analysis: the first dataset was coded with a single marked animal group (*i.e*., marked cows and bulls were pooled), the second dataset was coded such that marked cows and marked branch-antlered bulls were different groups, and the third dataset was coded with 7 groups: cow elk according to which of the 5 GMUs they occupied and bull elk relative to whether they occupied the mudflow or forested upland units. The single marked group dataset facilitated estimating total elk abundance, the 2-group dataset supported formal estimates of the subpopulations of the total number of adult cows and total number of branch-antlered bulls, and the 7-group dataset supported estimating GMU-specific abundance of cow elk and setting-specific abundance of branch-antlered bulls (mudflow vs. managed forest).

We developed a candidate model set for each analysis that consisted of 11 models for the 1-group dataset, 10 models for the 2-group dataset, and 15 models for the 7-group dataset. Alternative model parameterizations reflected different model constraints on detection probabilities and individual heterogeneity effects. Our models included possible temporal effects that we believed might be logically related to our survey results. For the recapture (resighting) probability (p_i), we contemplated models with no temporal variation (.), models wherein the first and second survey sessions across years were represented by a unique recapture probabilities, and models where we assumed various year-specific effects on recapture probabilities. These temporal

effects models were based on potential influences of winter severity on detectability and on our experiences that generally suggested that detectability of elk was better the later into the spring that we flew. We used Akaike's Information Criterion, adjusted for small samples (AIC_c) and Akaike model weights (w_i) to make inference about the best supported models among our candidate models (Burnham and Anderson 2002), and we averaged across models to derive final abundance estimates.

The data collection described in the methodology for sightability-correction modeling (above) provided the essential data for our mark-resight analyses. The necessary data elements included the enumeration and sex/age classification of all elk within groups encountered during the visual portion of the experimental helicopter surveys and an accounting of the distribution of radiomarked elk among these groups (including identity of radiomarked elk). Our mark-resight analyses were based on 2 replicated surveys of the core study area each winter.

We compared sightability model estimates to LNME mark-resight estimates by estimating Pearson's product-moment correlation coefficient using GMU-specific annual abundance estimates from both approaches for adult cows.

Recruitment and Population Growth Rate

We assessed annual calf recruitment at the approximate end-of-winter by estimating the ratio of calves to 100 cows, a standard metric for juvenile recruitment. At the study area and GMU scales, we estimated the annual ratios and associated confidence intervals for years with 2 replicate surveys following Skalski et al. (2005) for sampling with replacement and following Skalski et al. (2005) for 2013 data (1 survey) for sampling without replacement. Fall antlerless elk harvest will affect calf:cow ratios estimated the following spring because animals have potentially been removed from both the numerator (calves) and denominator (cows). This is expected to be particularly problematic under liberal antlerless harvest, as was occurring during our study. Typically, most antlerless elk harvest consists of yearling and older cows (WDFW, unpublished data), and under this scenario, spring calf:cow ratios would tend towards overestimation, relative to the actual ratios that would be observed in the absence of harvest. We attempted to adjust our spring calf:cow ratios to account for this using

estimated annual antlerless elk harvest and estimates of the ratio of calves to older elk in the harvest from hunter survey data. We consider the subsequent adjusted ratios as indices of spring calf:cow ratios rather than as formal estimates given compounded sampling error from each component (*i.e*., observed ratio, estimated harvest, estimated age-class distribution in the harvest).

We estimated the exponential population growth rate (r) as the slope of a weighted regression of the natural log transformed population estimates over years for both sightability model and LNME abundance estimates. We used the delta method (Casella and Berger 2002) to obtain the variance-covariance matrix of ln(N) from the variance-covariance matrix of (N). For LNME estimates, we obtained the variance-covariance matrix of abundance estimates from Program MARK (White and Burnham 1999). For the sightability model, because we obtained each estimate from independent data, all covariance terms were 0. We used function glm() in R (R Core Development Team 2008) to fit the weighted regression and used the inverse of the variance-covariance matrix of ln(N) as the weight-matrix. We constructed confidence intervals for r using the standard error for the slope from the weighted regression, assuming asymptotic normality.

Survival

We estimated annual survival rates for radiomarked elk during 2009-2010, 2010-2011, 2011-2012, and 2012-2013 (*i.e*., 4 survival years) using maximum-likelihood methods by invoking known fate models in Program MARK (White and Burnham 1999). For this analysis we coded encounter history data using 6 groupings: 5 GMU-specific groups for adult cows and a single pooled branch-antlered bull group. We estimated annual survival for a survival year defined as May 1-Apr 30 and estimated confidence intervals for annual survival using profile likelihoods. By using 15 alternative model parameterizations, we tested several hypotheses about Mount St. Helens elk survival during 2009-2012. Models varied in complexity from a simple 2 parameter model (survival differed only by sex, with no temporal or spatial variation) to a 24 parameter model (survival differed across groups and years). We compared models using

Akaike's Information Criterion, adjusted for small sample sizes (AIC_c) (Burnham and Anderson 2002).

We attempted to account for radiomarked elk mortalities by cause. Outside of the winter-spring season, when we conducted most of our annual population assessment fieldwork, our monitoring of radiomarked elk was infrequent, so sometimes we could not assign a definitive cause of death. We were, however, confident that we could reasonably discriminate most natural mortalities from hunting-related mortalities, based on timing of death, evidence at carcasses we located, or other corroborating evidence (*e.g*., a cleanly cut collar with no carcass). A majority of the hunting-related mortalities were reported to us by hunters, according to directions embossed on one side of the ear tag each elk received when it was originally captured.

Elk Hoof Disease

During the late 1990s, elk in southwest Washington with an apparent hoof affliction were first reported. Initial reports came from lowland valleys where pastureland interfaced with more traditional elk habitat. These reports, ranging from limping elk to elk with elongated hoof sheaths and/or ulcerated hooves, were sporadically received over the next several years. At the time our study began, the condition was known to exist in segments of the Mount St. Helens elk herd, but appeared to be limited to the west-most portion of the herd area. Our research scope did not formally include evaluating the spatial extent, morbidity, or population dynamics implications of this condition. During our elk capture operations we attempted to avoid capturing elk that were clearly sick or injured, as these animals typically would have elevated risk of capture-related complications. However, during the course of our work we inadvertently captured a few elk with varying degrees of hoof disease; this occurred when the affliction was not obvious as the elk ran from the pursuing helicopter. We did radiocollar such elk, and they provided some limited information on near-term fates of elk with hoof disease. The sample size of radiomarked elk with hoof disease was not sufficient, however, to formally assess any contribution to annual mortality risk for elk, specific to hoof disease, nor would these elk be considered a random sample of affected elk.

Concurrent with the latter portion of our study, investigations were initiated to identify the etiology and better define the epidemiology of this condition. This work is being conducted by veterinary pathologists at several veterinary colleges around the world, in consult with the Washington Department of Fish and Wildlife's staff veterinarian. Results from the veterinary investigations are beyond the scope of this report and will be published elsewhere.

Environmental and Temporal Effects

In addition to the analytic methods previously described, we explored a variety of temporal (year), spatial (GMU or subareas), and weather variables for their effects on responses such as IFBF, pregnancy, recruitment, indexed overwinter mortality, etc. We used general linear models (GLM) when the potential predictor variables were categorical (*e.g.*, year, GMUs, subareas) and/or the response was nominal (*e.g.*, pregnant vs. non-pregnant), and we used ordinary least squares (OLS) regression when responses and potential predictors were interval data. We also estimated the product-moment correlation coefficient to evaluate collinearity between pairs of quantitative variables (*e.g.*, annual recruitment and overwinter mortality indices).

To explore the potential effects of weather on calf recruitment and overwinter mortality, we used SNOTEL data from the Spirit Lake SNOTEL site as potential predictors and the annual calf recruitment index and overwinter mortality index as responses. From the SNOTEL data, we calculated: 1) total late summer/ early fall (Aug 1- Sep 30) precipitation, 2) total early summer (May 1 – July 31) precipitation, 3) total lactation season (May 1 – Sep 30) precipitation, 4) the linear slope (OLS) of accumulated late summer/early fall (Aug 1 – Sep 30) precipitation, 5) accumulated snow water equivalents (SWE) for early winter (Dec 1 – Jan 31), 6) SWE for late winter (Feb 1 – Mar 31), and 7) SWE for the full winter (Nov 1 – Mar 31). We used SWE to index winter severity because SNOTEL data on daily snow depth were not routinely collected at any SNOTEL site near our study area until shortly prior to our study, preventing us from characterizing longer-term winter severity. We calculated standard normal deviates (Z_i) for each weather metric, where $Z_i = X_i - \mu / \sigma$, and X_i = the observed value for year i, μ = the 1990-2005 mean for that metric, and σ = the standard deviation

(1990-2005) for that metric. This transformed observed annual weather metrics during our study into the number of standard deviations (+/-) relative to the long-term mean for a given metric. For example, a positive Z value for early summer precipitation would indicate a wetter than normal early summer and a negative Z value would indicate a drier than normal early summer. Spring-summer-fall drought was indicated by negative Z values, and severe winters were indicated by positive Z values. Our hypotheses were that spring calf recruitment would be potentially positively influenced by wet summer-fall weather in the birth year and/or potentially negatively influenced by higher winter severity in the calves' first winter. We hypothesized overwinter mortality would be higher in springs following droughty summer-falls and/or severe winters. To explore the cumulative effect of poor late summer-fall conditions combined with a subsequent harsh (snowy) winter, we changed the sign of the summer-fall precipitation Z-scores and then summed the summer-fall precipitation and winter SWE Z-scores. We did this so that for both seasonal weather severity indices, a positive Z-score reflected increased weather severity (relative to elk energy budgets) and negative Z-scores for weather severity reflected good environmental conditions for elk.

RESULTS

Capture and Marking

We captured 150 unique elk (110 F: 40 M) during 154 mid-winter capture events, 2009-2012. The ages of cow elk we captured ranged 1-16 years, with most cows in the prime-age class (ages 2-11 years) (Fig. 13). The ages of branch-antlered bull elk we captured ranged 2-9 years (Fig. 14). The median estimated age, based on cementum annuli, for both captured cows and captured bulls was 5 yrs. Yearling cows were very likely under-represented in our captured elk sample (relative to the population) due to size selection intended to prevent darting very large calves (*i.e*., the sizes of very large calves and very small yearlings potentially overlapped). No elk died during handling; 1 cow elk died within a few days of capture, possibly due to post-capture complications.

We captured 26, 18, 12, 36, and 22 cows and 12, 11, 8, 5, and 4 branch-antlered bulls across GMUs 520, 522, 524, 550, and 556, respectively. Across years, 2009-2012, we captured and radiomarked 44, 27, 21, and 22 cow elk and 11, 11, 10, and 8 branch-antlered bulls, respectively. Effort across years maintained relatively consistent radiomarked elk sample sizes, 2009-2012, in the face of annual attrition due to mortalities and collar malfunction.

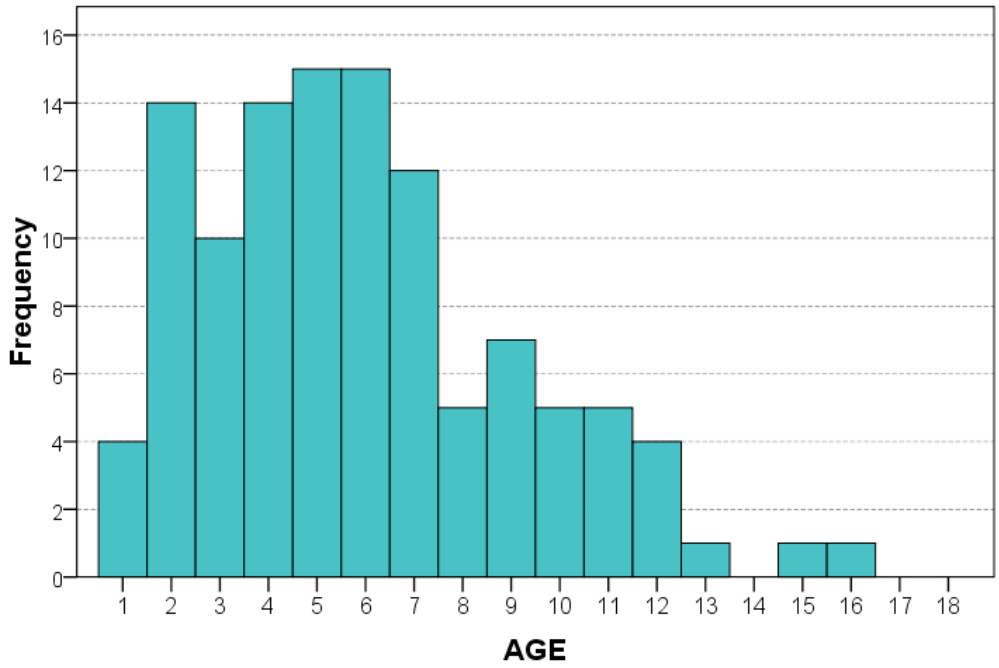

Figure 13. Distribution of ages for cow elk captured and radiomarked, Feb 2009-2012, Mount St. Helens, Washington.

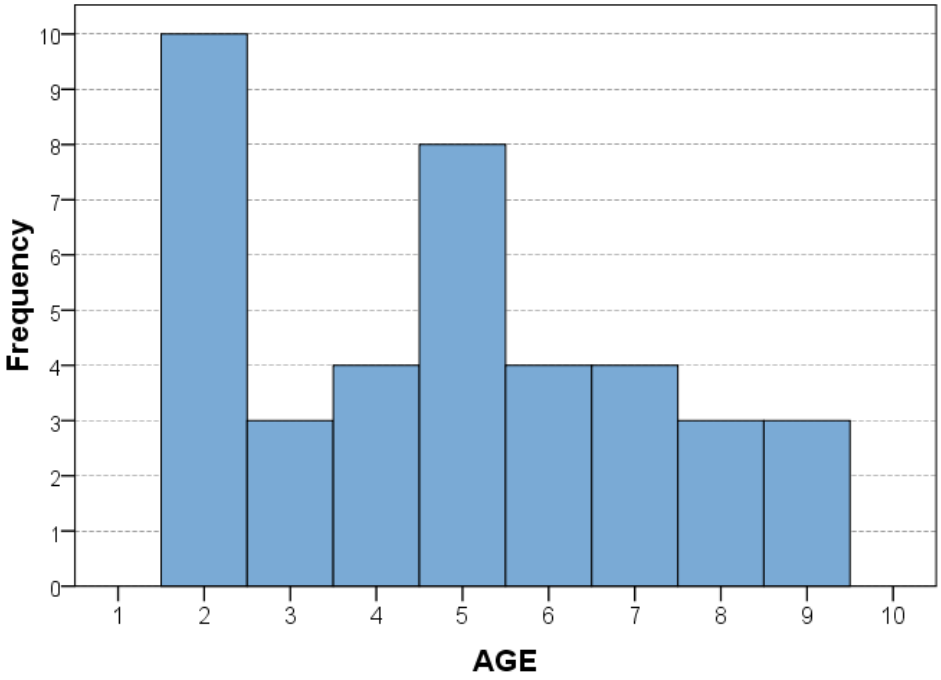

Figure 14. Distribution of ages for bull elk captured and radiomarked, Feb 2009-2012, Mount St. Helens, Washington.

Late-Winter Condition and Fertility

The mean body mass for cow elk handled in February was 218.2 kg (481.1 lbs) (95% CI = 214.9-221.4 kg; 473.9-488.2 lbs). For branch-antlered bulls, mean body mass was 246.3 kg (543.1 lbs) (95% CI = 239.7-253.0 kg; 528.5-557.9 lbs). Cow body mass generally increased with age until about age 5 (Fig. 15). Although body mass among cows we handled was highest at about age 10, age-specific estimates were based on small samples after about age 7. The heaviest cow we handled was 253.7 kg (559.4 lbs) and the heaviest bull was 287.01 kg (632.8 lbs). The numbers of branch-antlered bull elk we handled were insufficient to support inference about the mass vs. age relationship for bulls.

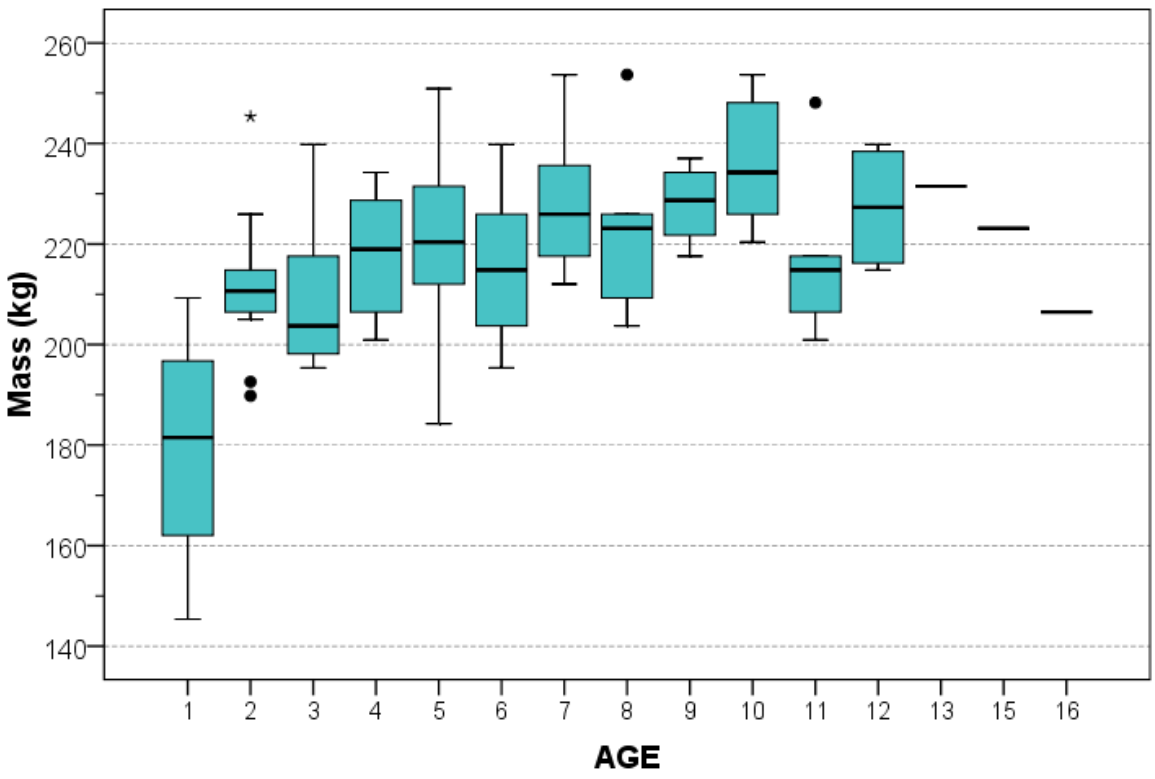

Figure 15. Boxplots of age-specific mass for cow elk captured and radiomarked, Feb 2009-2012, Mount St. Helens, Washington. Colored boxes represent the middle 50% of estimates within each age-class, and heavy horizontal lines represent median values. Only a single estimated mass was available for cows aged 13, 15, and 16.

Using a general linear model with fixed effects for year, GMU, pregnancy status, and lactation status, we did not detect any systematic effect of year (*P* = 0.32) on winter body fat (IFBF) for adult (≥2 yr-old) cow elk. GMU, lactation, and pregnancy did affect IFBF (*P* = 0.02, 0.07, 0.005, respectively). Lactaters were consistently leaner than non-lactating elk across years (Fig 16). Pregnant elk were fatter than non-pregnant elk (Fig. 17). Pooling years and GMUs, mean IFBF in February was 5.64% (95% CI = 5.08-6.21%) for non-lactating cow elk and was 3.26% (95% CI = 2.34-4.18%) for elk with evidence of late season lactation. Similarly, means for non-pregnant and pregnant adult cows were 3.38% (95% CI = 2.56-4.20) and 5.95% (95% CI = 5.38-6.52) IFBF.

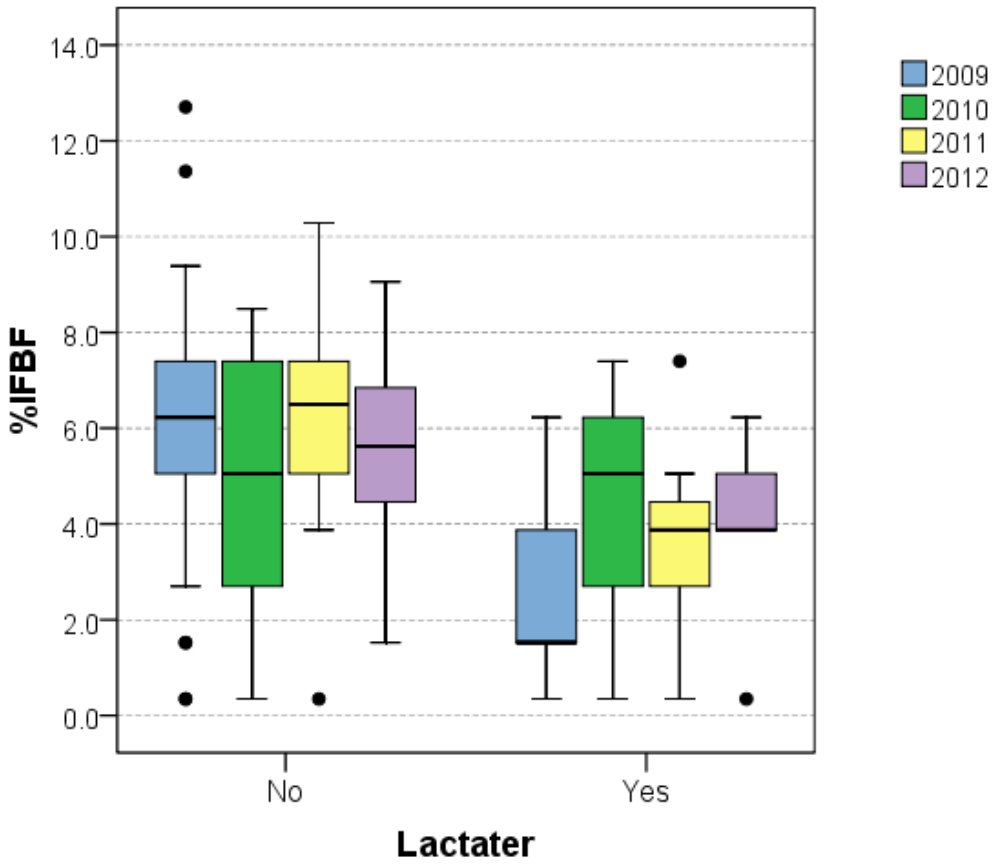

Figure 16. Boxplots for ingesta-free body fat (%IFBF) by lactation status for cow elk captured and radiomarked, Feb 2009-2012, Mount St. Helens, Washington. Colored boxes represent the middle 50% of estimates, and heavy horizontal lines represent median values.

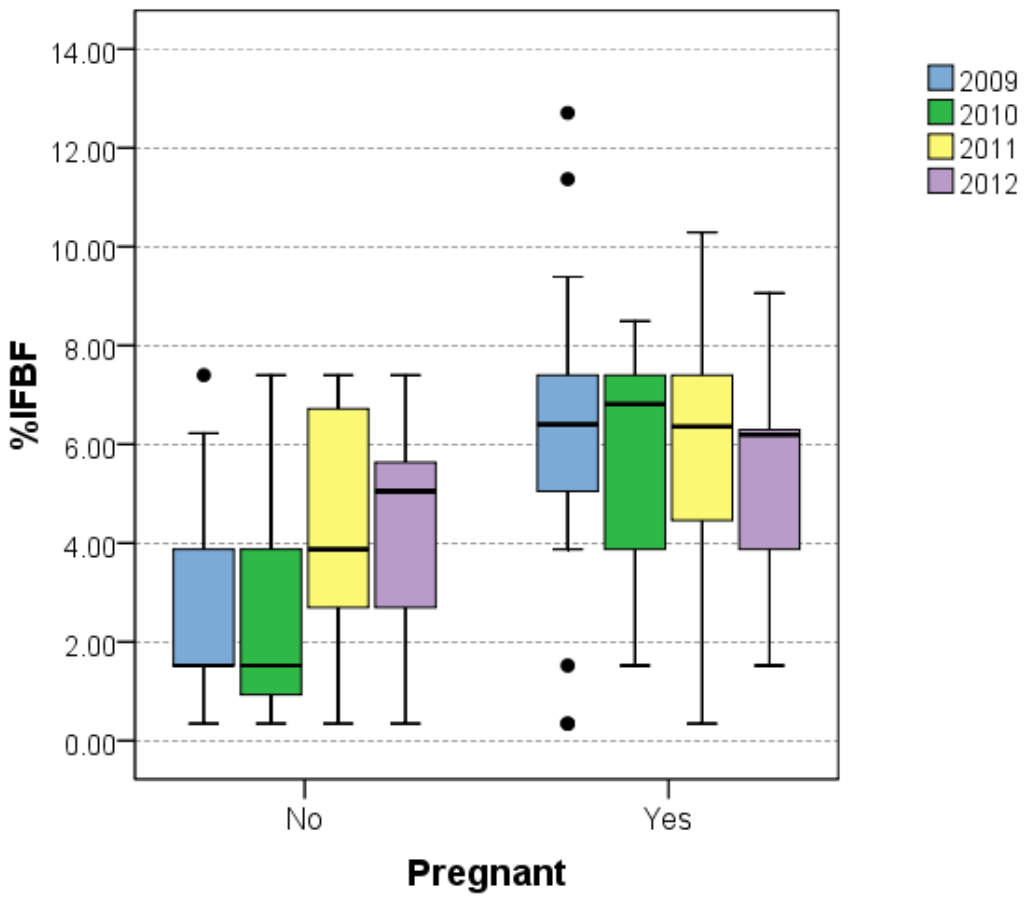

Figure 17. Boxplots for ingesta-free body fat (%IFBF) by pregnancy status for cow elk captured and radiomarked, Feb 2009-2012, Mount St. Helens, Washington. Colored boxes represent the middle 50% of estimates, and heavy horizontal lines represent median values.

Using a general linear model to control for the fixed effects of lactation and pregnancy status, which both were related to IFBF (see above), we found some differences among GMUs in mid-winter IFBF for adult (≥ 2 yr-old) cow elk that we handled, 2009-2012. Using $P \leq 0.05$ as the significance level, GMU 522 cow elk had higher IFBF levels than cow elk captured in GMUs 520 and 550 (Fig. 18); other GMU contrasts were not significantly different ($P > 0.05$).

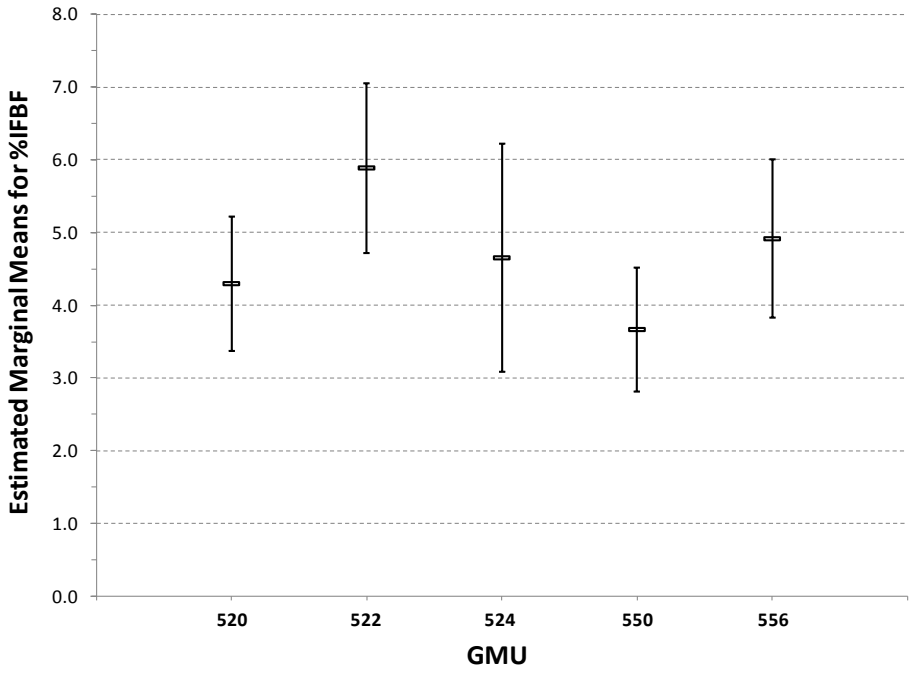

Figure 18. Plot of marginal means for %IFBF by GMU, controlling for pregnancy and lactation status, Mount St. Helens cow elk, 2009-2012.

Overall, 73 of 109 (67%) adult (≥ 2-yr-old) cow elk we handled in mid-winter, 2009-2012 were pregnant on ultrasound examination; none of 4 yearling cows were pregnant. We had limited data for very old cows, but among 3 cows older than 12 years, 2 (66.7%) were pregnant. Of 73 cows aged 4-10 years, 52 (71.2%) were pregnant in February. Across GMUs, the observed pregnancy rate among adult cows was 42.3% (*n* = 26) in GMU 520, 83.3% (*n* = 18) in GMU 522, 90.0% (*n* = 10) in GMU 524, 71.4% (*n* = 35) in GMU 550, and 65.0% (*n* = 20) in GMU 556. As above, there was a statistical association between cow elk condition and pregnancy; pregnant elk were fatter than non-pregnant elk. We did not detect an effect of year on pregnancy status. Evidence of recent lactation for cows handled in February was rare (4 of 73 pregnant cows; 3.5%).

Fall Body Condition

We collected hunter-contributed organ samples from 423 harvested elk during 2009-2011. These samples ranged from a single contributed organ (*e.g.*, a heart) to all

of the requested organs (*i.e*., heart, pericardium, kidneys). Among the 423 samples, there were 226 complete organ sets. Overall, we received 360 heart, 285 pericardium, and 347 kidney samples. Cook et al. (2001*b*) identified Kistner subset scores based on the full organ sample complement as excellent predictors of IFBF; they also explored various 2- and 1-organ subsets for their predictive utility relative to IFBF (R. Cook, personal communication). IFBF was clearly related to all 2 organ component pairs (*e.g*., heart-pericardium, heart-kidney; $r^2 > 0.90$). Relationships of single organ scores to IFBF were less consistent ($r^2 = 0.64$, 0.82, and 0.88 for the heart pericardium, and kidneys respectively). We subsequently estimated IFBF using the full organ subsets and all 2-organ subsets available (2-organ predictive equations supplied by R. Cook). This allowed us to derive 364 usable estimates of fall IFBF for hunter-killed cow elk within the Mount St. Helens herd area, 2009-2011. Because yearling cow elk tend to be consistently lean (WDFW, unpublished data), we based further analyses on 323 fall IFBF estimates from cow elk older than 1 yr-old. Generally, the data were approximately normally distributed, with a few more very lean animals than expected (Fig. 19). IFBF estimates ranged 0.30-19.8% for cow elk older than yearlings.

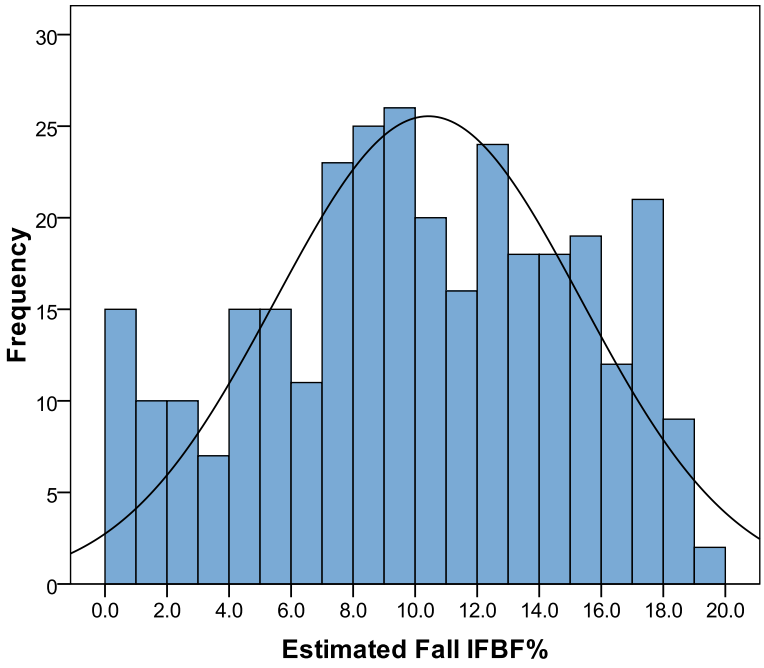

Figure 19. Frequency histogram (and normal curve) for fall IFBF estimates from hunter-killed cow elk, Mount St. Helens, WA, 2009-2011.

Sample sizes among some GMUs were small, so to explore potential spatial variation among fall IFBF estimates, we grouped the data into subareas (1 = the N. Fork of the Toutle River mudflow; 2 = the managed forest landscape of the core study area [GMUs 520, 524, 550, 556]; 3 = GMU 560; 4 = the Columbia Gorge GMUs). In a general linear model with fixed effects for year, subarea, and lactation status, and with cow age as a covariate, there were significant ($P \leq 0.05$) effects of subarea and lactation on IFBF; year and cow age did not affect IFBF. The marginal means by lactation status, controlling for other factors, were 12.51% IFBF for non-lactaters and 10.84% for lactaters. In the subarea contrasts, IFBF for cows from subarea 2 was lower (marginal mean = 9.20%) than for subarea 3 (marginal mean = 13.07%) and for subarea 4 (marginal mean = 12.38%) cows (Fig. 20). Estimates for mudflow cows (marginal mean = 12.07%) were qualitatively similar to estimates for subarea 3 and 4 cows and different than for subarea 2 cows, but because few mudflow cows were sampled (n = 9) the pair-wise contrasts involving mudflow cows were nonsignificant.

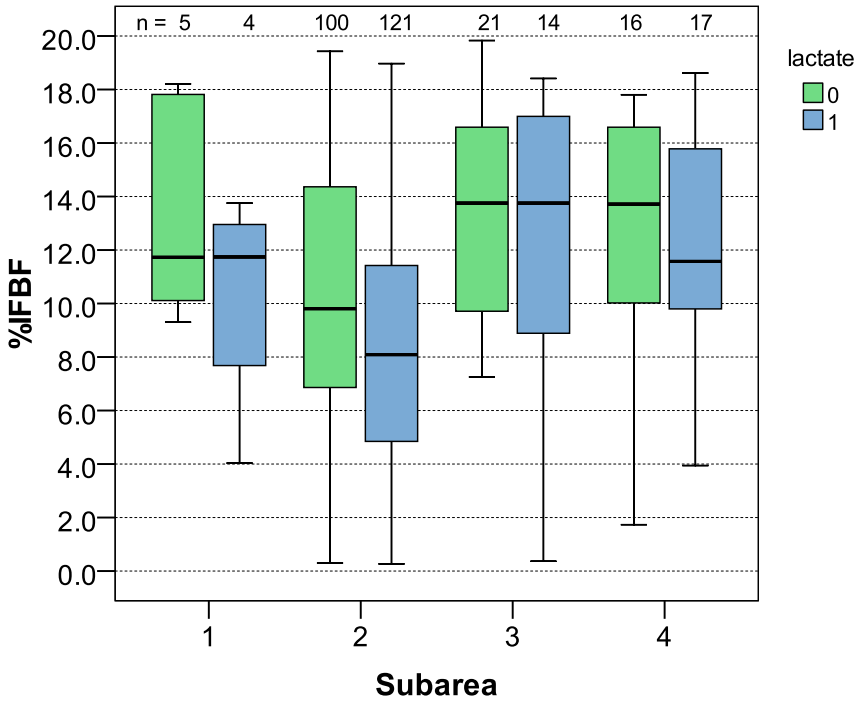

Figure 20. Boxplots for fall %IFBF from hunter-killed elk across subareas (1 = GMU 522, 2 = GMUs 520, 524, 550, 556, 3 = GMU 560, 4 = Columbia Gorge GMUs) by lactation status, Mount St. Helens, WA, 2009-2011.

Sightability Modeling

We collected sighting trial data for 331 groups containing at least 1 radiomarked elk during 2009-2011. Overall, we saw 174 groups (52.6%) without aid of telemetry and missed 157 groups (47.4%) that we later located via telemetry. We saw a higher proportion of radiomarked cow groups (146 of 261 groups; 55.9%) than of radiomarked bull groups (28 of 70 groups; 40.0%; Table 1). Elk were more easily seen when in larger groups, when active, and when in open (*i.e*., low canopy cover) cover types (Table 1). Relative snow cover and light conditions, as we measured them, did not seem to systematically affect elk sightability on this landscape.

The covariates CAN, GRP, LG2GRP, and SEX were all related to the probability that an elk group was sighted in univariate tests (Table 2). Because one of the outcomes (*i.e*., sighted or missed) was not observed for at least 1 level of the categorical covariates ACT and COV, MLEs did not exist for these covariates. We recoded ACT into a new covariate (ACT2) with 2 levels: 0 = bedded; 1 = active, and we recoded COV into a new covariate (COV2) with 4 levels: 1 = clearcut; 2 = regeneration stand, conifer, or alder; 3 = meadow, wetland, field, or mudflow. These new covariates were related to the probability that an elk group was sighted (Table 2).

Preliminary modeling indicated that LG2GRP was a better predictor of sightability than was the untransformed GRP covariate, so we subsequently used LG2GRP in all multivariate models. An analysis of variance (ANOVA) suggested that the covariate CAN (% canopy) was collinear with the recoded cover type covariate (COV2) (r^2 = 0.51), so we chose to use only the CAN covariate in subsequent multivariate logistic models. In a large number of cases where we missed a group and subsequently located it via telemetry we could not confidently determine the group's initial activity level, which resulted in a large number of missing values for ACT2. We were not comfortable attempting to impute data for all of these missing values, and to preclude eliminating a large number of cases from our multivariable models because of the missing activity data, we elected to drop the activity covariate from further consideration.

Table 1. Summary of univariate association of independent variable levels and sightability of elk groups during helicopter surveys, Mount St. Helens, 2009-2011.

Variable	Total Groups	Groups Seen	%Seen
Canopy (%)			
0-15	116	111	95.7
20-35	43	37	86.0
40-55	32	20	62.5
60-75	36	6	16.7
>75	101	0	0.0
Snow (%)			
< 50	278	150	54.0
≥ 50	50	24	48.0
Group Size			
1-2	68	21	30.9
3-4	20	13	65.0
5-6	23	15	65.2
7-8	28	19	67.9
9-10	81	15	18.5
>10	98	91	92.9
Group Type			
cow-calf	261	146	55.9
bull	70	28	22.0
Activity			
bedded	60	23	38.3
standing	150	142	94.7
moving	9	9	100.0
Cover Type			
clear cut	69	67	97.1
regeneration	91	52	57.1
conifer	67	2	3.0
alder	24	18	75.0
field/meadow/wetland	34	32	94.1
river or road	2	2	100.0
Light			
bright	55	31	56.4
flat	273	143	52.4

Table 2. Results of univariate significance tests (logistic regression) for predictor variables potentially affecting sightability of elk groups during spring helicopter surveys, Mount St. Helens, 2009-2011. Bold text delineates predictors significantly related to group sightability.

Variable	X^2	*P*-value
CAN	**296.44**	**<0.001**
SNOW	0.52	0.471
GRP	**62.28**	**<0.001**
LG2GRP	**40.69**	**<0.001**
SEX	**5.64**	**0.018**
ACT	***	***
ACT2	**79.16**	**<0.001**
COV	***	***
COV2	**131.67**	**<0.001**
LIGHT	0.29	0.589

*** model did not converge; MLE does not exist.

Among our candidate sightability models, 2 models accounted for 98% of the available model weight (Table 3). The best model had 3 predictor variables (LG2GRP, CAN, and SEX) and an intercept. The next best model, which was 1.70 AIC_c units from the best model, was similar except that it lacked the SEX variable. All of the remaining models were at least 7.36 AIC_c units from the best-supported model. Simple (*i.e.*, 1 predictor variable) models that predicted sightability based on group size (LG2GRP), canopy closure (CAN), or sex (SEX) alone had little support. The sign for the SEX

covariate differed between the single variable model (*i.e.*, SEX was the only predictor) and the best multivariable model, the β_i for SEX was erratic across models and was poorly estimated (*i.e.*, large SE) (Table 4), the sign for SEX in the best multivariable model was illogical, and the Wald statistic for SEX in the best multivariable model was marginally nonsignificant (P = 0.06). Collectively, these results made us skeptical of inclusion of SEX in the multivariable context. So, we subsequently selected the second best model in Table 3 as our best model. This model predicted larger elk groups were more likely to be seen, as were elk in more open habitat (Table 4). This model fit the data (Hosmer-Lemeshow statistic = 9.26; P = 0.32) and correctly classified 91.4% of the model building observations; 163 of 179 groups predicted to be seen were seen (91.0% correct), and 125 or 136 groups predicted to be missed were missed (91.9% correct).

Table 3. Model selection results for models predicting the sightability of elk groups from a helicopter, Mount St. Helens Elk Herd Area, 2009-2011.

Model	K[a]	-2*LL*	AIC_c	ΔAIC_c[b]	w_i[c]
LG2GRP, CAN, SEX	4	145.59	153.72	0.00	0.69
LG2GRP, CAN	3	149.34	155.42	1.70	0.29
CAN	2	157.04	161.08	7.36	0.02
CAN, SEX	3	157.01	163.09	9.37	0.006
LG2GRP	2	397.32	401.35	247.63	0.00
LG2GRP, SEX	3	396.41	402.49	248.77	0.00
SEX	2	452.35	456.39	302.67	0.00

[a]Number of unique parameters in model$_i$.
[b]Difference in AIC_c units between model$_i$ and the best model.
[c]Relative model weight in model$_i$.

Table 4. Parameter estimates (β_i and standard errors = SE) for the fitted sightability models from Table 3, Mount St. Helens Elk Herd, 2009-2011.

Model	LG2GRP	SE(LG2GRP)	CAN	SE(CAN)	SEX	SE(SEX)
LG2GRP, CAN, SEX	0.63	0.20	-0.09	0.010	1.24	0.65
LG2GRP, CAN	0.42	0.17	-0.09	0.009	–	–
CAN	–	–	-0.09	0.009	–	–
CAN, SEX	–	–	-0.09	0.009	0.09	0.53
LG2GRP	0.54	0.09	–	–	–	–
LG2GRP, SEX	0.60	0.12	–	–	0.34	0.36
SEX	–	–	–	–	-0.64	0.27

Fitting the 2-predictor multivariable model with effects of group size and canopy on predicted sightabilities yielded the following model:

$$y = 2.85 + 0.42(\text{LG2GRP}) - 0.09(\text{CAN})$$

Sightability-corrected estimates of total elk abundance and total cow elk abundance (2 estimates per year from replicated surveys), derived from the above sightability model, indicated relatively stable to slightly increasing numbers of elk within our 5-GMU study area from 2009 to 2011 and a subsequent substantial decline during 2012-2013 (Fig. 21). Peak point estimates for total elk and total cow elk were 5,132 elk and 2,803 cow elk in the spring of 2011; minimum point estimates were 2,717 elk and 1,608 cow elk in the spring of 2013.

GMU-specific estimates for total elk abundance, 2009-2013 (Figs. 22-26), indicated a relatively steady decline in elk abundance in GMUs 520 and 550, a modest decline in GMU 524, an initial increase followed by a substantial decline in GMU 556, and initially increasing then stabilizing numbers of elk in GMU 522.

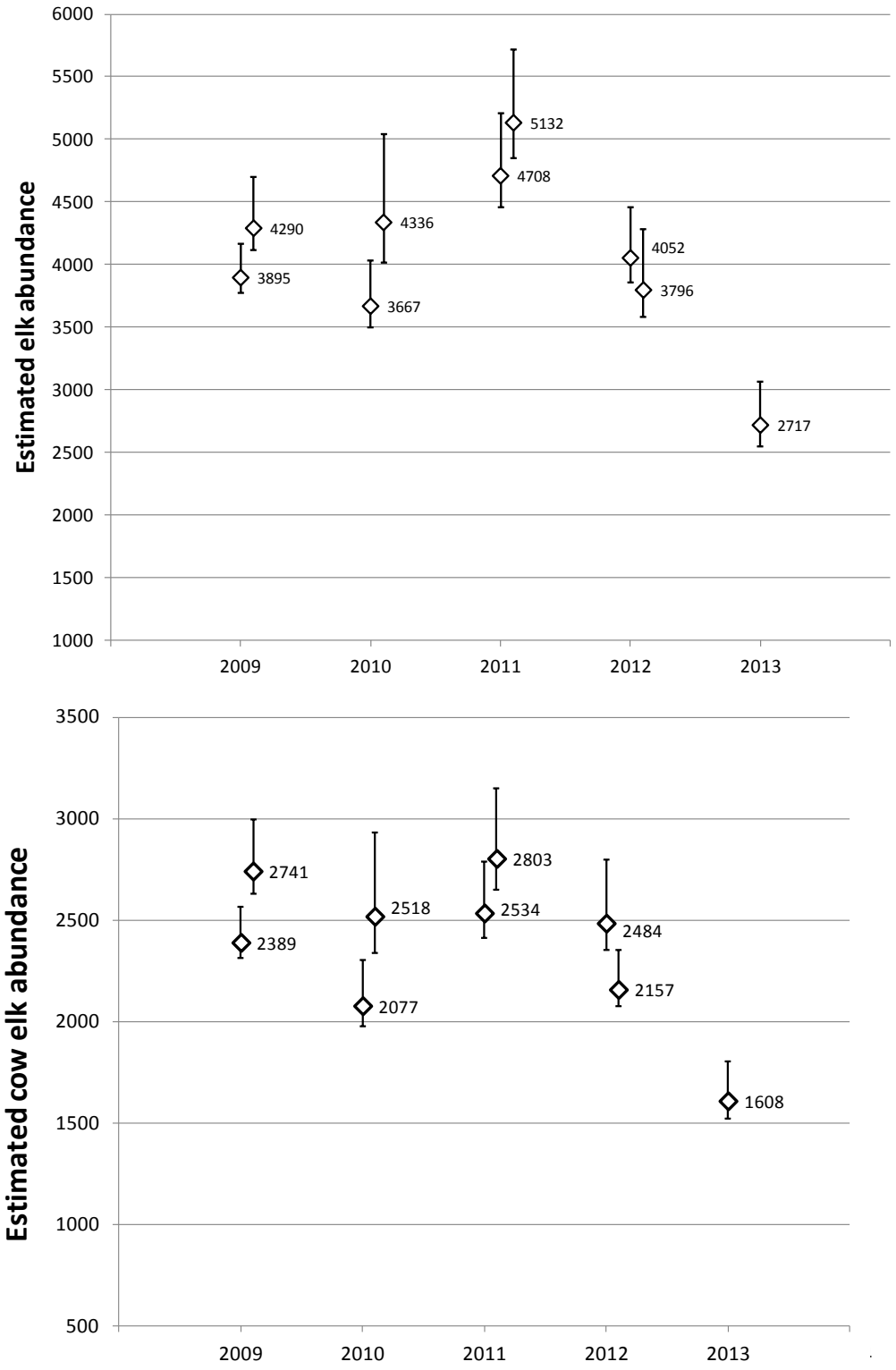

Figure 21. Sightability model estimates (± 95% CI) for total elk and total cow elk abundance in the study area, Mount St. Helens, 2009-2013.

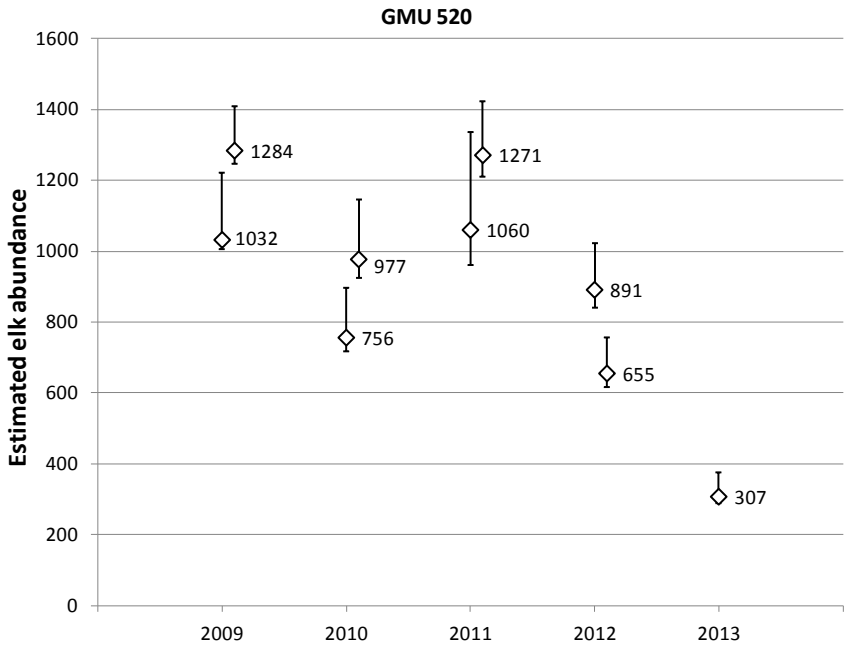

Figure 22. Sightability model estimates for total elk abundance (± 95% CI) in GMU 520, Mount St. Helens, 2009-2013.

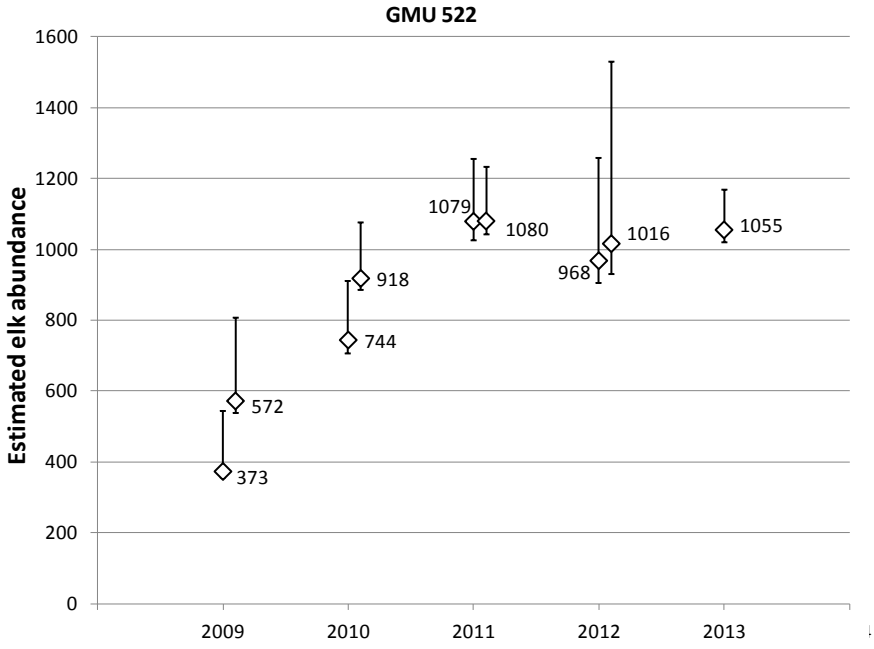

Figure 23. Sightability model estimates for total elk abundance (± 95% CI) in GMU 522, Mount St. Helens, 2009-2013.

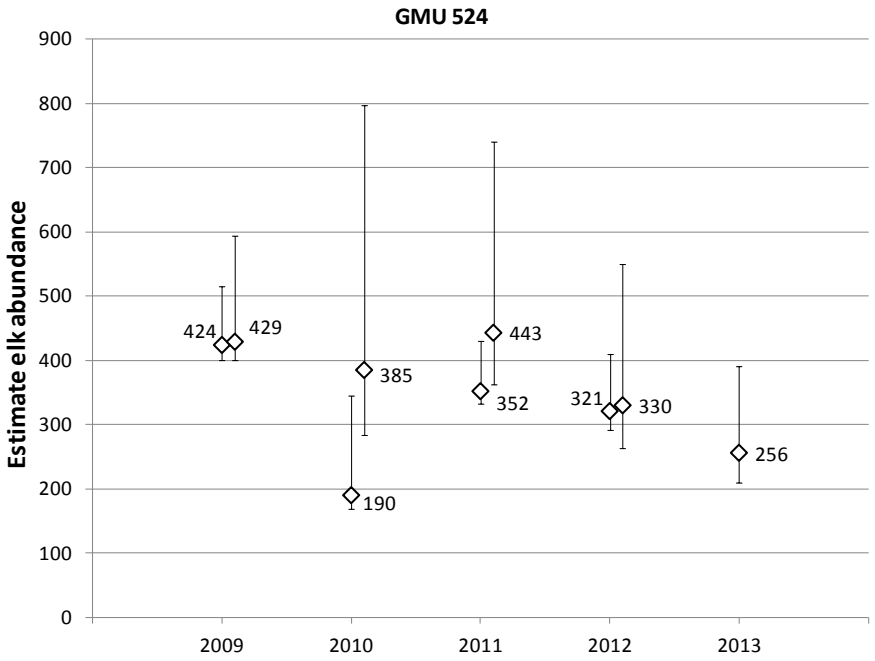

Figure 24. Sightability model estimates for total elk abundance (± 95% CI) in GMU 524, Mount St. Helens, 2009-2013.

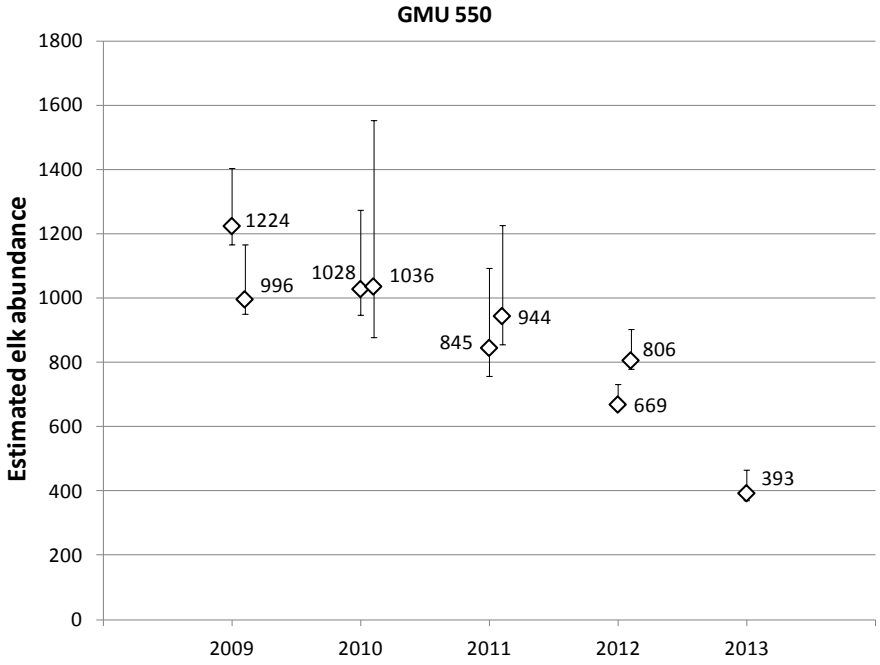

Figure 25. Sightability model estimates for total elk abundance (± 95% CI) in GMU 550, Mount St. Helens, 2009-2013.

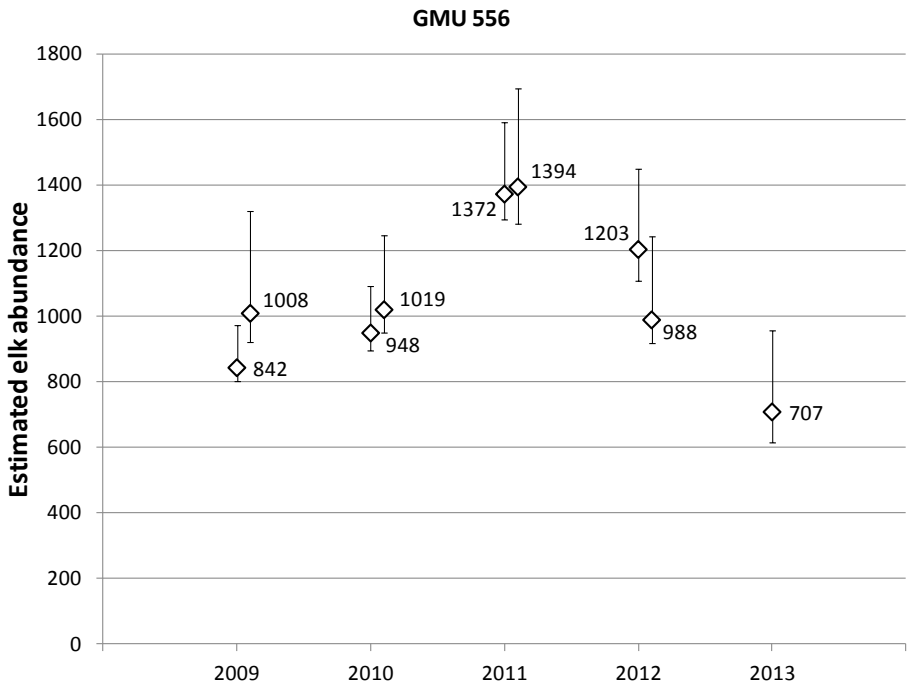

Figure 26. Sightability model estimates for total elk abundance (± 95% CI) in GMU 556, Mount St. Helens, 2009-2013.

GMU-specific estimates for total cow elk abundance, 2006-2013 (Figs. 27-31), also indicated a steady decline in the number of cow elk in GMUs 520 and 550, a modest decline in GMU 524, a slight increase followed by a decrease in GMU 556, and a relatively steady increase in cow numbers in GMU 522.

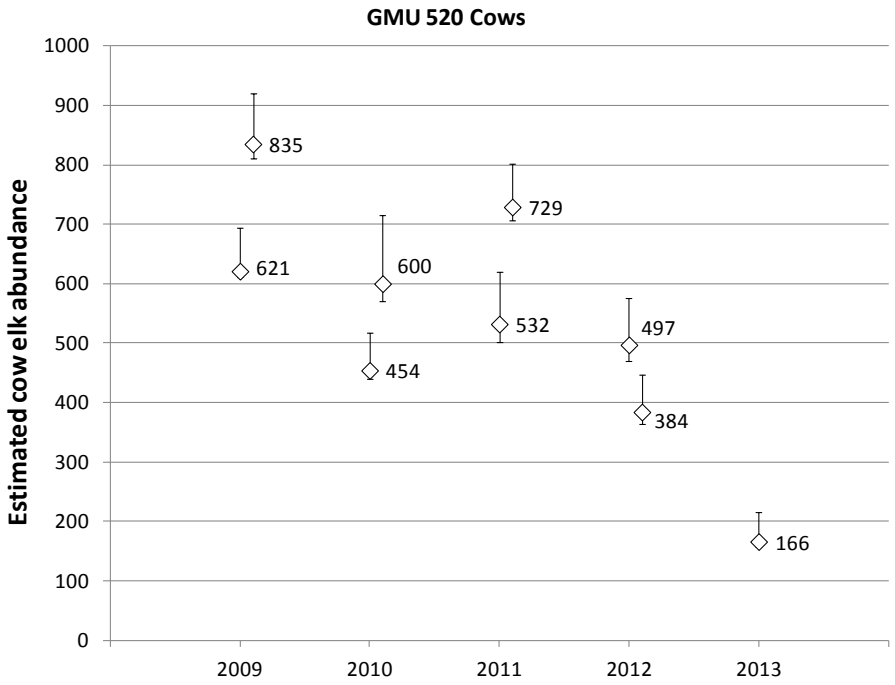

Figure 27. Sightability model estimates for cow elk abundance (± 95% CI) in GMU 520, Mount St. Helens, 2009-2013.

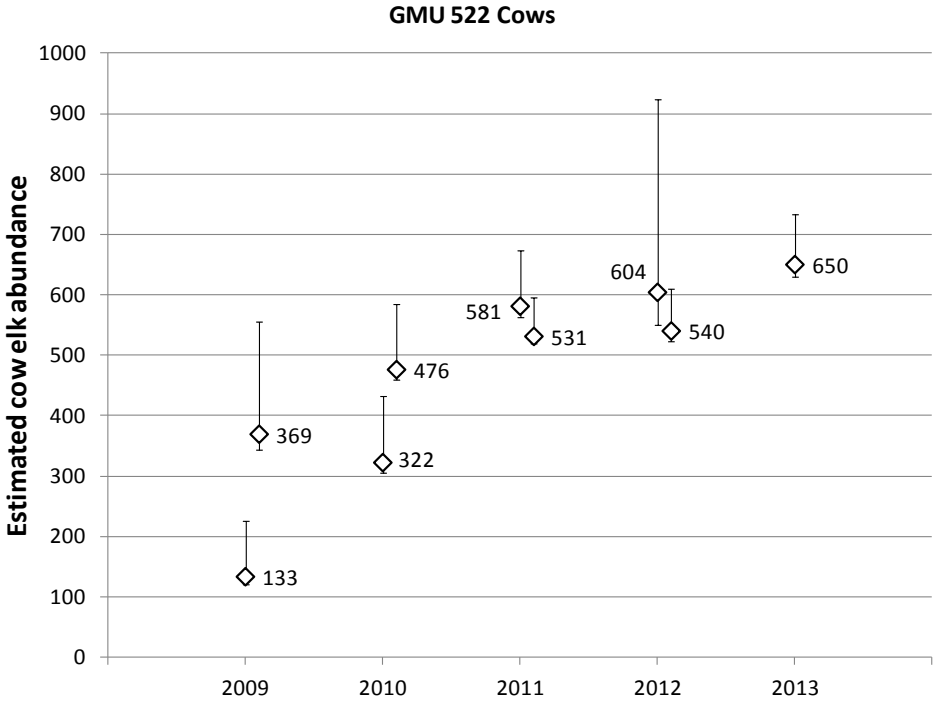

Figure 28. Sightability model estimates for cow elk abundance (± 95% CI) in GMU 522, Mount St. Helens, 2009-2013.

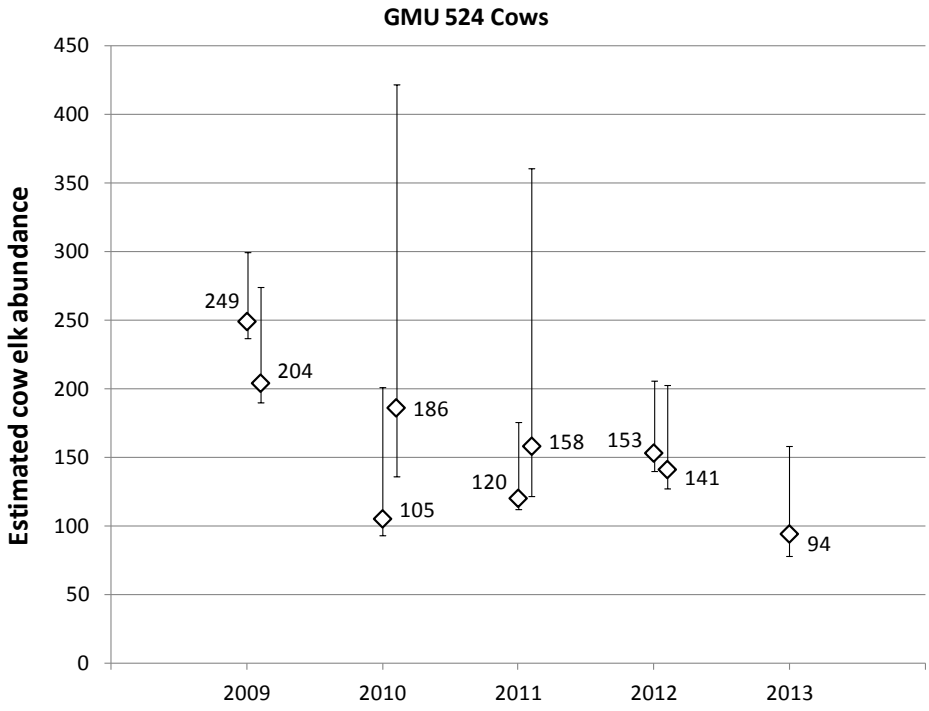

Figure 29. Sightability model estimates for cow elk abundance (± 95% CI) in GMU 524, Mount St. Helens, 2009-2013.

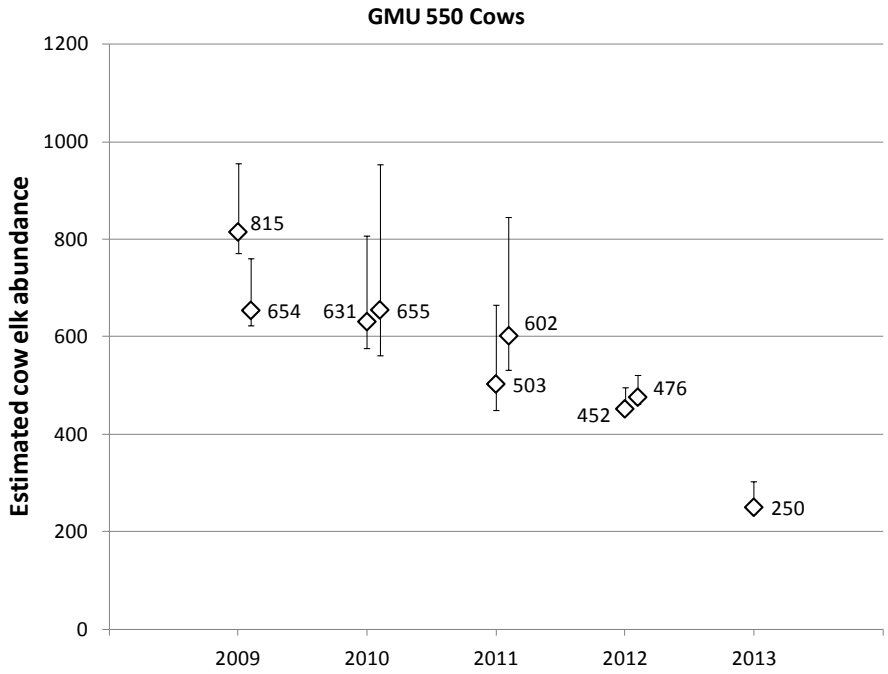

Figure 30. Sightability model estimates for cow elk abundance (± 95% CI) in GMU 550, Mount St. Helens, 2009-2013.

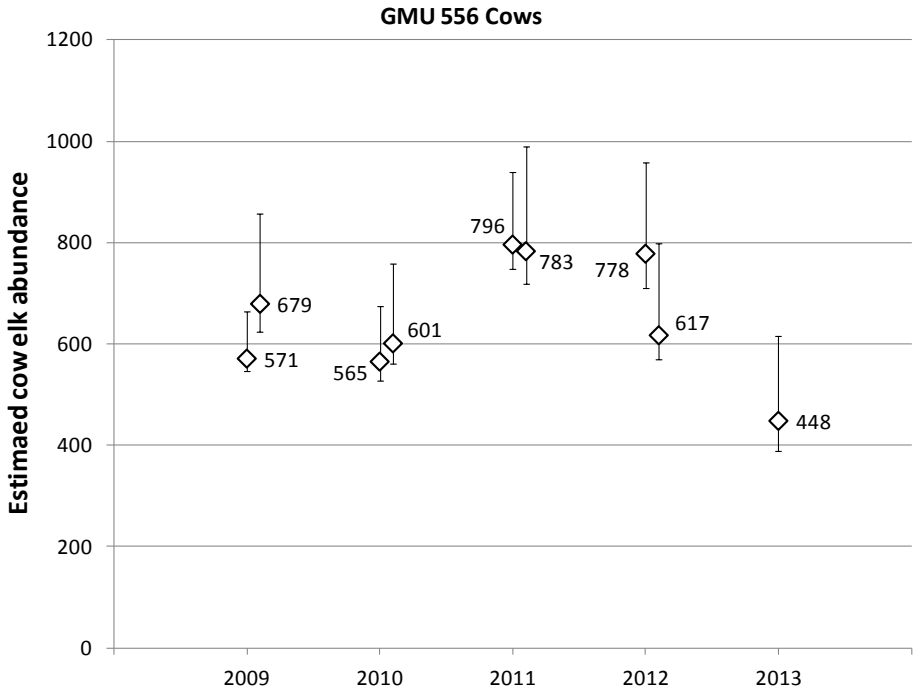

Figure 31. Sightability model estimates for cow elk abundance (± 95% CI) in GMU 556, Mount St. Helens, 2009-2013.

Mark-Resight

As per the Methods section (above), we generated mark-resight estimates 2009-2012 using the LNME model, a multi-sampling-occasion model, and using the Lincoln-Petersen (LP) model for 2013 (1 sampling occasion). Across the 11 LNME models for total elk in the area surveyed twice each year, 2009-2012, the best supported model had a constant detection parameter (p_i), 2 unique heterogeneity parameters (σ_i) (where 2009=2011 and 2010=2012), and annual variation in estimated total elk (Table 5). Two other models were within 2 AIC_c units of the best model. The second best-supported model had 2 unique detection parameters (1 for 2012 and 1 for all other years), a constant heterogeneity parameter, and annual variation in estimated total elk (Table 5). The last model within 2 AIC_c units of the best model was the simplest model, with a single estimated detection parameter across all sessions, a constant heterogeneity

estimate, and annual variation in estimated total elk (Table 5). The remaining models had limited support.

Table 5. Model selection results for LNME mark-resight estimates of total number of elk in the 5-GMU study area, 2009-2012, Mount St. Helens, WA.

Model[a]	K[b]	AIC_c[c]	ΔAIC_c[d]	w_i[e]	Dev[f]
p(.),σ^2(2009=2011≠2010=2012),N(yr)	7	829.28	0.00	0.32	814.88
p(2012≠else),σ^2(.),N(yr)	7	830.35	1.07	0.19	815.95
p(.),σ^2(.),N(yr)	6	830.72	1.43	0.16	818.41
p(2011≠else),σ^2(.),N(yr)	7	832.12	2.84	0.08	817.72
p(2009≠else),σ^2(.),N(yr)	7	832.50	3.22	0.06	818.10
p(sess1≠sess2),σ^2(.),N(yr)	7	832.52	3.23	0.06	818.11
p(.),σ^2(yr),N(yr)	9	833.35	4.06	0.04	814.70
p(2010≠else),σ^2(.),N(yr)	7	833.71	4.43	0.04	819.31
p(yr),σ^2(.),N(yr)	9	834.46	5.18	0.02	815.81
p(sess1≠sess2[g]),σ^2(yr),N(yr)	10	835.19	5.90	0.02	814.39
p(full),σ^2(yr),N(yr)	16	842.89	13.61	<0.001	808.87

[a] model structure (p = detection probability; σ^2 = heterogeneity parameter; N = abundance estimate).
[b] number of unique model parameters.
[c] Akaike's Information Criterion, adjusted for small samples.
[d] difference in AIC_c units between $model_i$ and the best model.
[e] Akaike model weight.
[f] model deviance.
[g] detection probability varied between first and second surveys, but no annual effect.

Model-averaged estimates of total elk abundance in the area we surveyed each year with replicated surveys, based on the LNME model weights in Table 5, suggested a modest decline in total elk during 2009-2012; using the LP estimate from the same area in 2013 suggested an overall substantial decline in total elk, 2009-2013 (Fig. 32).

Actual estimates ranged from a high of 8,238 elk in 2011 to a low of 4,987 in 2013. Estimates generally depicted a consistent pattern, except that the 2011 estimate was substantially higher than the estimates for the previous 2 years. We discuss possible explanations for this in the Discussion section, but note here that the 2009-2010 winter was by far the mildest winter of the study; the high estimate for the spring of 2011 occurred 1 year after the mild winter. The models in Table 5 and the estimates derived from those models in Fig. 32 also did not allow detection rates of cows and bulls to be sex-specific.

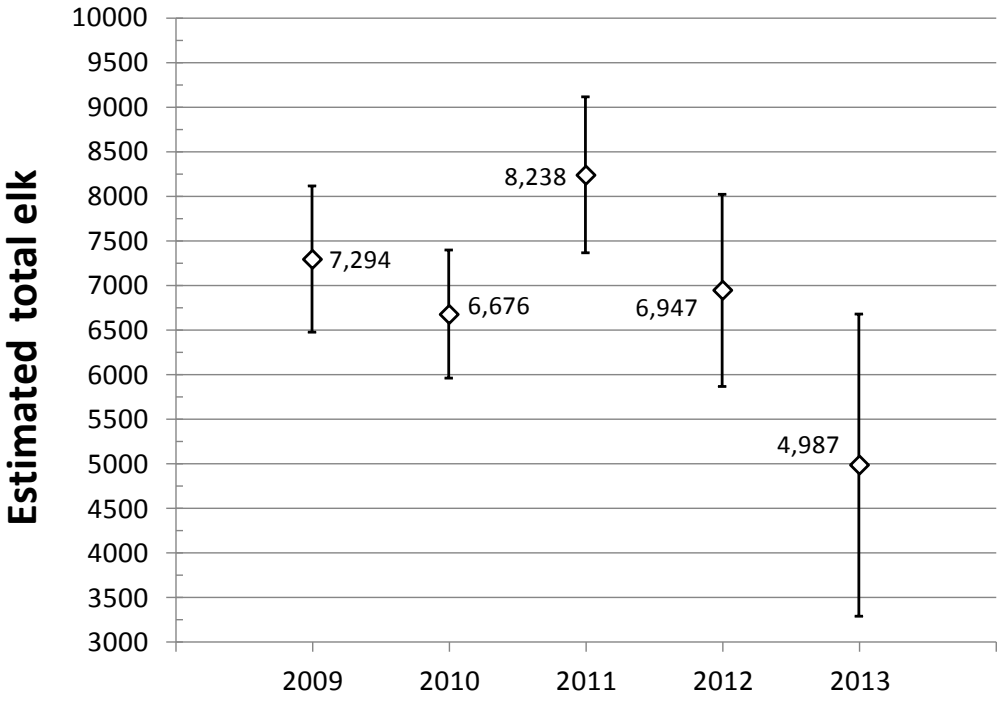

Figure 32. Mark-resight estimates (2009-2012 = LNME; 2013 = Lincoln-Petersen) for total elk (± 95% CI) in the 5-GMU study area, 2009-2013, Mount St. Helens, WA.

Among the 10 LNME models we evaluated for estimating the total number of cow elk and the total number of branch-antlered bull elk in the area we surveyed twice each year, 2009-2012, only 2 models were well-supported. Collectively, these 2 models

accounted for 99% of the available model weight. The best model had 12 unique parameters: 2 year-invariant, but sex-specific detection parameters, 2 year-invariant, but sex-specific heterogeneity parameters, and sex and year-specific estimates of abundance (Table 6). The next best model was 0.81 AIC*c* units from the best model and differed from the best model only in that it had a single unique detection parameter that was equal for both sexes (Table 6). The remaining models in the candidate model set, including those with the least and most unique parameters were not supported.

Table 6. Model selection results for LNME mark-resight estimates of total number of cow elk and branch-antlered bull elk in the 5-GMU study area, 2009-2012, Mount St. Helens, WA.

Model[a]	**k**[b]	**AIC$_c$**[c]	**ΔAIC$_c$**[d]	**w$_i$**[e]	**Dev**[f]
p(sex),σ^2(sex),N(sex × yr)	12	869.31	0.00	0.59	844.19
p(.),σ^2(sex),N(sex × yr)	11	870.11	0.81	0.40	847.17
p(sex × yr),σ^2(sex),N(sex × yr)	18	877.22	7.91	0.01	838.71
p(yr),σ^2(sex × yr),N(sex × yr)	24	885.94	16.63	<0.001	833.43
p(sex × yr),σ^2(sex × yr),N(sex × yr)	32	901.08	31.77	0.00	828.89
p(sex),σ^2(sex),N($F_{1=2\neq3\neq4}$[g], M[.])	8	980.79	111.48	0.00	964.28
p(.),σ^2(sex),N($F_{1=2=3\neq4}$, M[.])	7	1000.94	131.63	0.00	986.54
p(sex),σ^2(sex),N(sex)	6	1022.40	153.09	0.00	1010.10
p(sex),σ^2(sex),N($F_{1=2\neq3=4}$, M[.])	7	1023.15	153.84	0.00	1008.75
p(.),σ^2(.),N(sex × yr)	10	3596.29	2726.90	0.00	3575.51

[a] model structure (p = detection probability; σ^2 = heterogeneity parameter; N = abundance estimate).
[b] number of unique model parameters.
[c] Akaike's Information Criterion, adjusted for small samples.
[d] difference in AIC$_c$ units between model$_i$ and the best model.
[e] Akaike model weight.
[f] model deviance.
[g] cow elk abundance constrained [number subscripts 1-4 = spring 2009-2012].

Model-averaged estimates of total cow elk abundance in the area we surveyed each year with replicated surveys, based on the LNME model weights in Table 6, suggested a pattern similar to the pattern for the total elk abundance estimates, 2009-2012 (Fig. 33). The LNME estimates for total cows declined from spring 2009 to spring 2010, increased again in spring 2011, and declined in spring 2012. Estimates ranged from a high of 4,444 cows in 2011 to a low of 3,758 cows in 2010. Including the LP estimate from the 2013 mark-resight survey, the overall pattern indicated a decline in the number of cow elk, 2009-2013 (Fig. 33). The LNME estimates for total branch-antlered bull abundance, 2009-2012, and the 2013 LP estimate for branch-antlered bull abundance in the area we surveyed each year suggested a relatively stable branch-antlered bull subpopulation, 2009-2013 (Fig. 34). Estimated bull numbers ranged from 647 (2009) to 797 (2013); confidence intervals for the 2013 cow and bull estimates were broad.

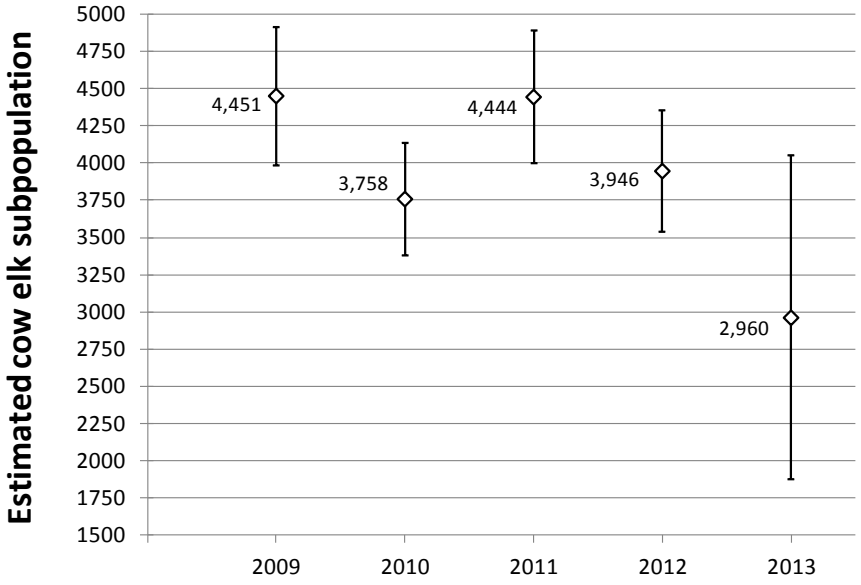

Figure 33. Mark-resight estimates (2009-2012 = LNME; 2013 = Lincoln-Petersen) for total cow elk (± 95% CI) in the 5-GMU study area, 2009-2013, Mount St. Helens, WA.

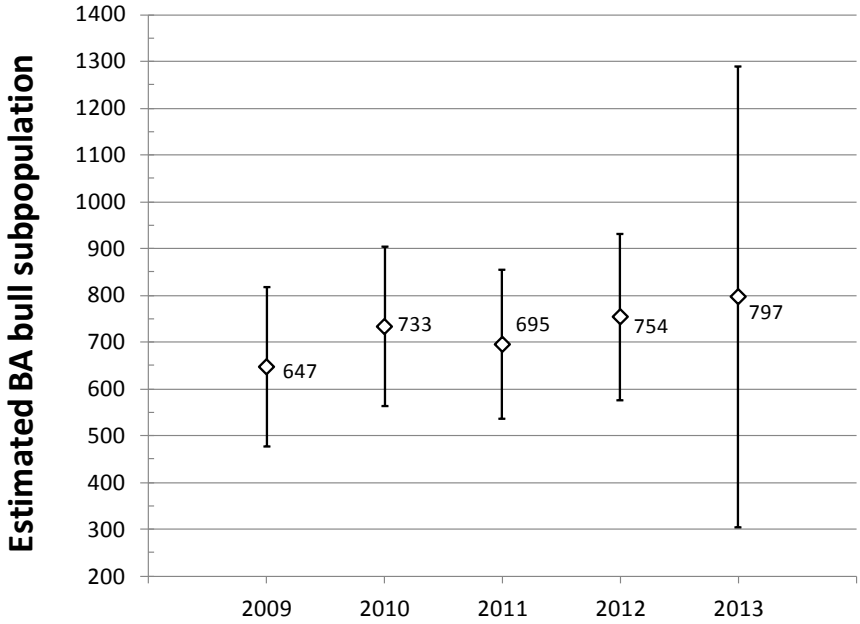

Figure 34. Mark-resight estimates (2009-2012 = LNME; 2013 = Lincoln-Petersen) for total branch-antlered bull elk (± 95% CI) in the 5-GMU study area, 2009-2013, Mount St. Helens, WA.

Detection rates for radiomarked elk, estimated as the derived parameter μ under the fully parameterized, sex-specific, LNME model (Table 6) were generally higher for radiomarked cows than for bulls (Table 7). Estimated detection for cows ranged 0.43-0.64 across surveys; 6 of 8 estimated detection rates for radiomarked cow elk were >0.50. Estimated detection for bulls ranged 0.28-0.56 across surveys; only 3 of 8 detection rate estimates for radiomarked bulls exceeded 0.50. Under the best sex-specific model, which had a single detection rate parameter for cows and a single parameter for bulls, μ = 0.54 (95% CI = 0.49-0.59) for radiomarked cows and μ = 0.44 (95% CI = 0.36-0.54) for radiomarked bulls.

Table 7. Estimated detection rates for radiomarked elk from the fully parameterized, sex-specific LNME mark-resight model, 2009-2012, Mount St. Helens, WA.

Year	Session	Sex	Estimated detection (μ_i)	95% CI_{low}	95% CI_{high}
2009	1	F	0.64	0.48	0.77
2009	2	F	0.56	0.41	0.71
2010	1	F	0.56	0.42	0.68
2010	2	F	0.52	0.39	0.65
2011	1	F	0.49	0.38	0.61
2011	2	F	0.60	0.48	0.71
2012	1	F	0.52	0.39	0.64
2012	2	F	0.43	0.32	0.56
2009	1	M	0.38	0.15	0.68
2009	2	M	0.28	0.09	0.60
2010	1	M	0.51	0.26	0.75
2010	2	M	0.44	0.21	0.69
2011	1	M	0.56	0.34	0.75
2011	2	M	0.51	0.30	0.71
2012	1	M	0.39	0.20	0.63
2012	2	M	0.39	0.20	0.63

Among the 15 models in the candidate model set for data coded to 7 groups (GMU-specific cows, branch-antlered bulls in GMU 522, branch-antlered bulls in the other 4 GMUs), 2 models garnered >80% of the model weight (Table 8). The best model had 4 detection parameters (*i.e*., cows in GMU 522, all other cows, bulls in GMU 522, and bulls in all other GMUs), a single heterogeneity parameter that applied to all groups across all years, and group and sex-specific abundance parameters. The second best model was similar, except that heterogeneity was modeled as sex-specific (Table 8). All the remaining models were at least 3.52 AIC_c units from the best-supported model.

Table 8. Model selection results for LNME mark-resight estimates of group-specific cow elk (5 groups = GMU) and branch-antlered bull elk (2 groups = mudflow and non-mudflow bulls), 2009-2012, Mount St. Helens, WA.

Model[a]	K[b]	AIC_c[c]	ΔAIC_c[d]	w_i[e]	Dev[f]
pF(522[g]), *pM*(grp), σ^2(.),*N*(grp × yr)	33	1041.28	0.00	0.58	967.18
pF(522), *pM*(grp), σ^2(sex),*N*(grp × yr)	34	1043.10	1.82	0.23	966.48
pF(.), *pM*(grp), σ^2(.),*N*(grp × yr)	32	1044.80	3.52	0.10	973.20
pF(.), *pM*(grp), σ^2(sex),*N*(grp × yr)	33	1046.45	5.18	0.04	972.35
pF(grp), *pM*(grp), σ^2(sex),*N*(grp × yr)	37	1047.24	5.97	0.03	962.94
pF(522), *pM*(grp), σ^2(.),*N*(grp × yr, M'[h])	30	1048.31	7.03	0.02	981.66
pF(.), *pM*(grp), σ^2(.),*N*(grp × yr, M')	29	1051.76	10.48	0.003	987.56
pF(522), *pM*(.), σ^2(sex),*N*(grp × yr)	33	1055.57	14.30	<0.001	981.47
pF(.), *pM*(.), σ^2(sex),*N*(grp × yr)	32	1058.94	17.67	<0.001	987.35
pF(522), *pM*(grp), σ^2(sex),*N*(grp × yr, F'[i])	31	1127.33	86.06	0.000	1058.22
pF(.), *pM*(grp), σ^2(sex),*N*(grp × yr, F')	30	1135.67	94.39	0.000	1069.03
pF(522), *pM*(grp), σ^2(.),*N*(grp × yr, F''[j])	27	1262.98	221.70	0.000	1203.63
pF(.), *pM*(grp), σ^2(.),*N*(grp × yr, F'')	26	1278.86	237.58	0.000	1221.92
pF(522), *pM*(grp), σ^2(.),*N*(grp)	12	1898.10	856.82	0.000	1873.05
pF(.), *pM*(grp), σ^2(.),*N*(grp)	11	1904.74	863.47	0.000	1881.86

[a] model structure (*pF* = cow detection probability; *pM* = bull detection probability; σ^2 = heterogeneity parameter; *N* = abundance estimate).

[b] number of unique model parameters.

[c] Akaike's Information Criterion, adjusted for small samples.

[d] difference in AIC_c units between $model_i$ and the best model.

[e] Akaike model weight.

[f] model deviance.

[g] unique cow detection parameter for GMU 522 cows.

[h] abundance for non-GMU 522 bulls constant across years.

[i] abundance for GMU 556 cows constant across years.

[j] abundance for GMU 556 and GMU 524 cows constant across years.

Model-averaged LNME estimates of cow elk abundance in the area we surveyed each year with replicated surveys, based on the model weights in Table 8, suggested a substantial decline in GMU 520 and 550 during 2009-2012 (Figure 35). In GMU 520, point estimates indicated a decline of more than 40% between spring 2009 and spring 2012. In GMU 550, the indicated decline over the same period was about 1/3. During 2009-2012, cow elk abundance estimates in GMU 522 (the mudflow) increased, then stabilized (Fig. 35). In GMU 524, cow elk abundance estimates declined substantially between spring 2009 and spring 2010, and then became relatively stable (Fig. 35). Model-averaged LNME estimates for GMU 556 followed the same qualitative pattern as we had seen for total elk and total cow elk (Figs. 32, 33); estimates declined from 2009 to 2010, increased in 2011, and declined again in 2012 (Fig. 36). Overall, in GMU 556, estimated cow elk abundance was slightly higher in the last spring we conducted replicated surveys (2012) than it had been in the first 2 springs of our work (2009, 2010). We did not attempt to generate Lincoln-Petersen estimates of abundance at the GMU scale for the single 2013 survey because the numbers of marked elk per GMU were too small by spring 2013 to justify this approach.

Under the best LNME model derived for the 7-group dataset, the derived detection rate estimates (μ_i) for radiomarked elk were higher for both cow elk and for branch-antlered bull elk in GMU 522 (and the other portions of the North Fork of the Toutle R. mudflow) than for the rest of the study area (Table 9). Estimated detectability for bulls in the managed forest was relatively low and less than half that of mudflow bulls. LNME estimates for bull abundance were relatively stable 2009-2012 for both mudflow bulls and the forested subarea bulls (Fig. 37).

Table 9. Estimated detection rates for radiomarked elk from the best-supported, group-specific LNME mark-resight model, 2009-2012, Mount St. Helens, WA.

Group	Estimated detection (μ_i)	95% CI_{low}	95% CI_{high}
Cows (GMU≠522)	0.52	0.46	0.57
Cows (GMU=522)	0.67	0.56	0.77
BA bulls (GMU≠522)	0.33	0.24	0.44
BA bulls (GMU=522)	0.71	0.55	0.84

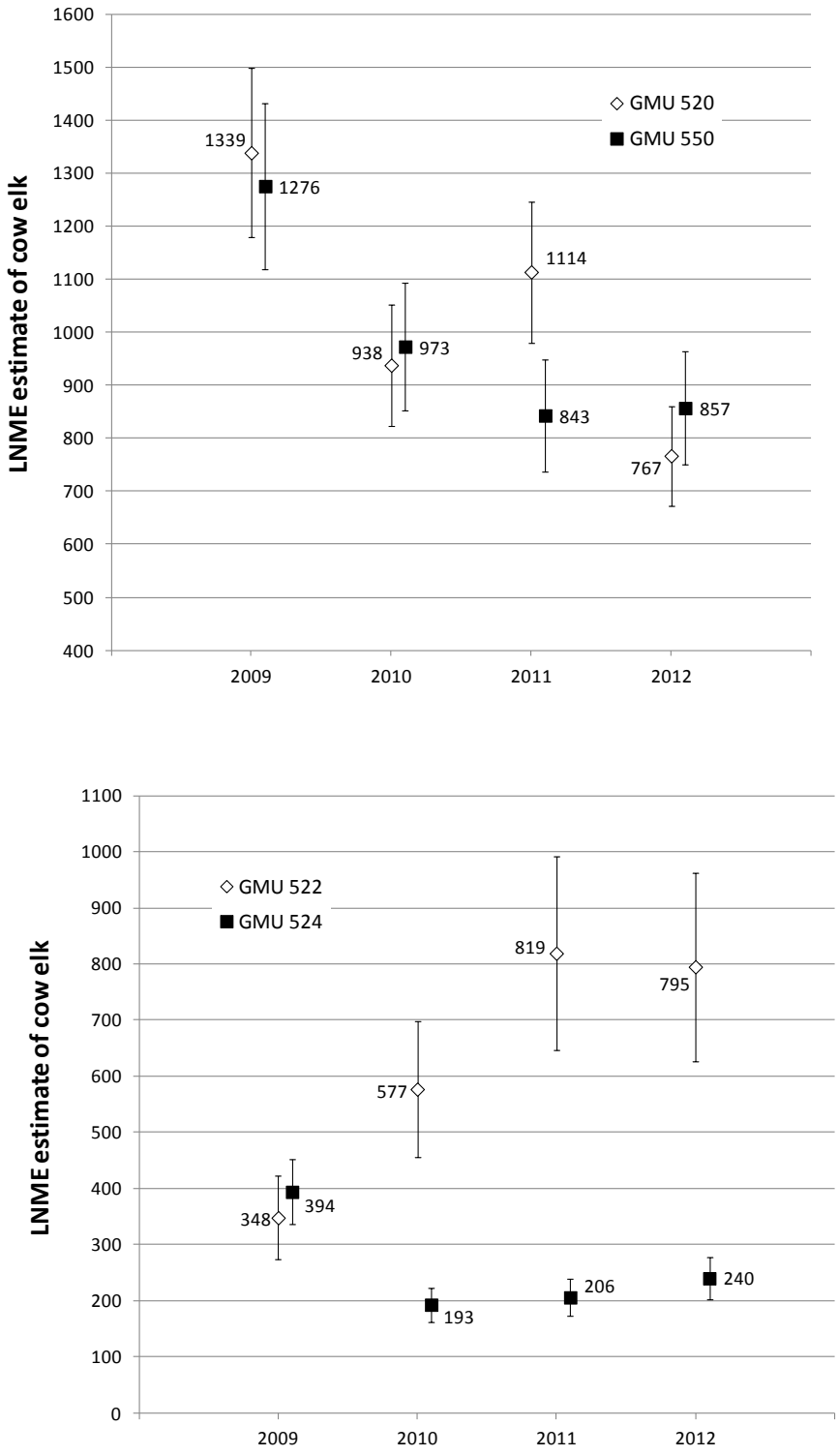

Figure 35. LNME Mark-resight estimates, 2009-2012, for total cow elk (± 95% CI) in GMUs 520 and 550 (top panel); 522 and 524 (bottom panel), Mount St. Helens, WA.

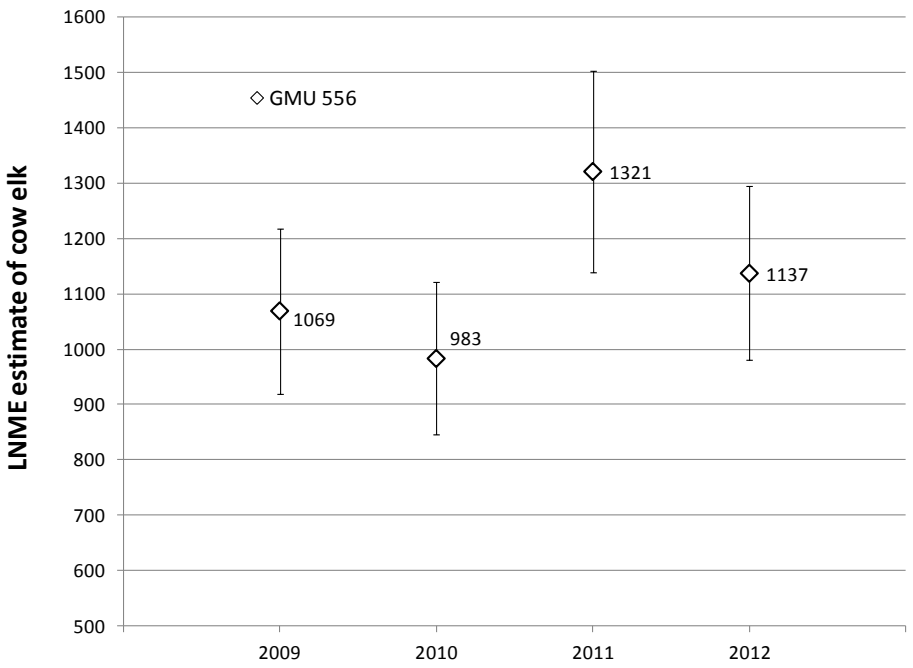

Figure 36. LNME Mark-resight estimates, 2009-2012, for total cow elk (± 95% CI) in GMU 556, Mount St. Helens, WA.

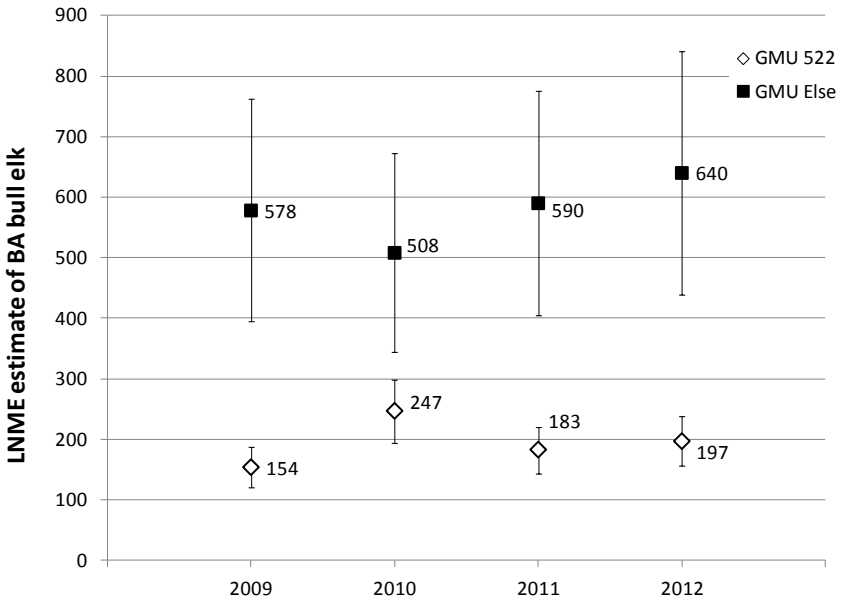

Figure 37. LNME Mark-resight estimates, 2009-2012, for total branch-antlered bull elk (± 95% CI), Mount St. Helens, WA.

Rate of Increase and Method Contrast

The series of annual estimates indicated a slight decline (negative rate of increase) for total elk abundance and total cow elk abundance using sightability model estimates, 2009-2013 (Table 10). By GMU, cow elk numbers declined substantially (≈ -20%) in GMUs 520, 524, and 550 using sightability model estimates. Cow elk abundance increased in GMU 522 and appeared relatively stable in GMU 556 using the sightability model estimates. For the mark-resight estimates, 2009-2012, total elk abundance trend was relatively flat and slightly negative for all cow elk (Table 10). For GMU 520, 524, and 550 cow elk, the mark-resight estimates indicated a substantive decline (≈-15%); the trend for GMU 522 mark-resight cow estimates was substantially positive and for GMU 556 cows was modestly positive (Table 10).

Table 10. Estimated group-specific, exponential rate of increase (r), Mount St. Helens, WA. Sightability model estimates (2009-2013); LNME mark-resight estimates (2009-2012).

Abundance	r	95% CI_{low}	95% CI_{high}
Sightability model			
All elk	-0.04	-0.13	0.04
All cow elk	-0.06	-0.13	0.01
GMU 520 cows	-0.21	-0.36	-0.05
GMU 522 cows	0.19	0.06	0.33
GMU 524 cows	-0.18	-0.28	-0.08
GMU 550 cows	-0.20	-0.27	-0.12
GMU 556 cows	0.01	-0.09	0.11
LNME mark-resight			
All elk	0.01	-0.09	0.12
All cow elk	-0.02	-0.11	0.07
All cow elk (2009-2013)	-0.08	-0.21	0.06
GMU 520 cows	-0.15	-0.30	-0.001
GMU 522 cows	0.28	0.11	0.45
GMU 524 cows	-0.15	-0.43	0.14
GMU 550 cows	-0.13	-0.22	-0.05
GMU 556 cows	0.05	-0.07	0.16

The mark-resight estimates for GMU-specific cow abundance across years, 2009-2012, were highly correlated (Pearson's $r \geq 0.94$; $P < 0.001$) with sightability model estimates (from first and second session replicates, and means of the 2) (Fig. 38).

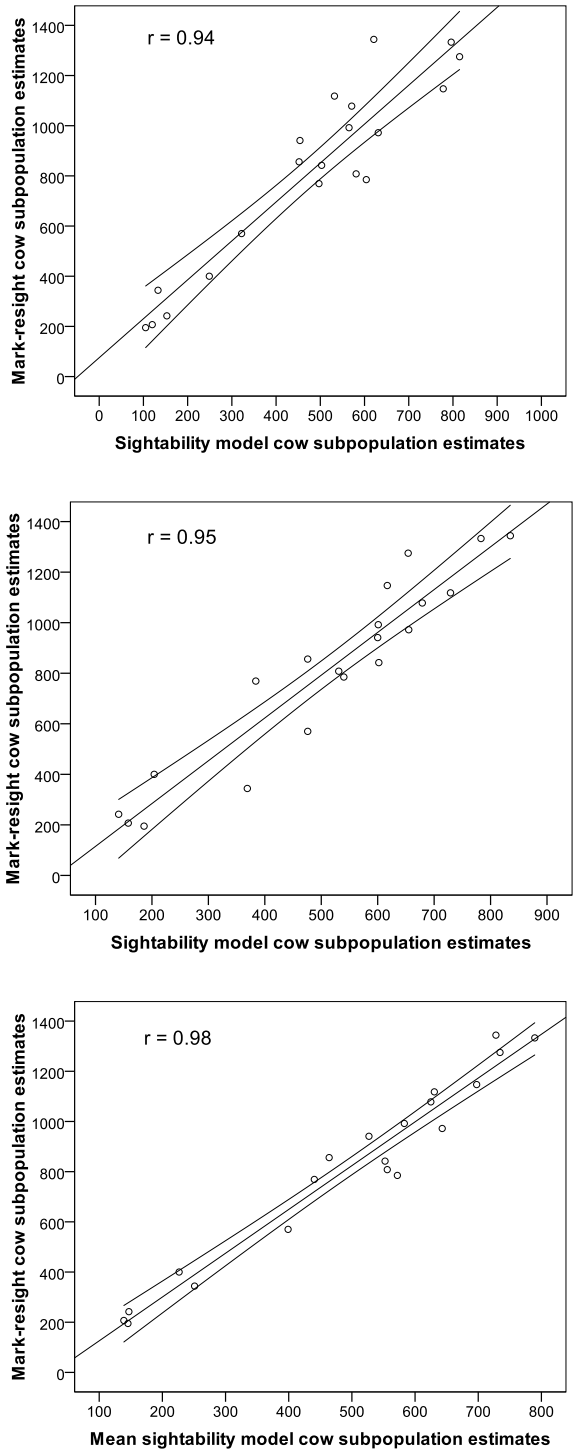

Figure 38. Correlation between Sightability Model (SM) estimates and LNME mark-resight estimates for cow elk abundance, 2009-2012 (panels are, top to bottom: for first survey replicate SM estimate, second survey SM estimate, and the means of the 2 annual SM estimates).

Recruitment

Annual observed spring calf recruitment across the entire 5-GMU study area varied considerably during 2009-2013, with estimates exceeding 40 calves per 100 cows in 2010 and 2011 and an estimate < 25 calves per 100 cows in 2013 (Fig. 39).

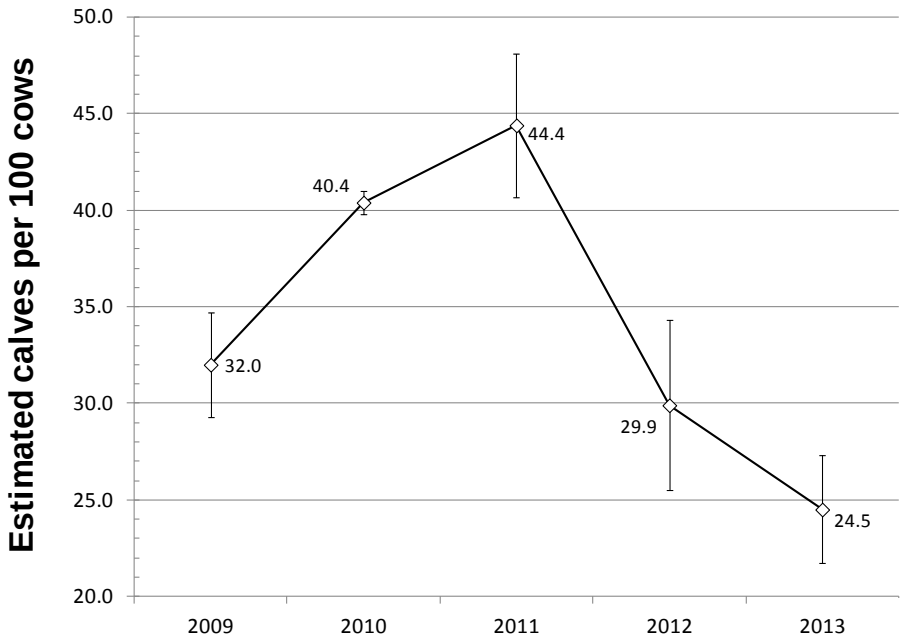

Figure 39. Elk calf-cow spring ratio estimates (plus 95% CI), 2009-2013, for the 5-GMU survey area, from aerial surveys, Mount St. Helens, WA.

In most of the 5 GMUs, the observed pattern was qualitatively similar to the landscape-level pattern. In 2011, the highest calf ratio estimates across the time series occurred in GMUs 520, 522, 524, and 550 (Fig. 40). The highest estimate in GMU 556 occurred in 2010. In all GMUs except 520, the observed ratios were relatively high in 2010 and 2011 and relatively low in 2009, 2012, and 2013 (Fig. 40). After adjusting the observed GMU-specific spring calf ratios for antlerless elk harvest the previous fall, the derived calf recruitment indices followed a relatively consistent pattern across all 5 GMUs (Fig. 41). Adjusting for antlerless harvest mostly had the effect of aligning the GMU 520 pattern to those of the other 4 GMUs, and aligning the indices for 2012 and 2013 across GMUs.

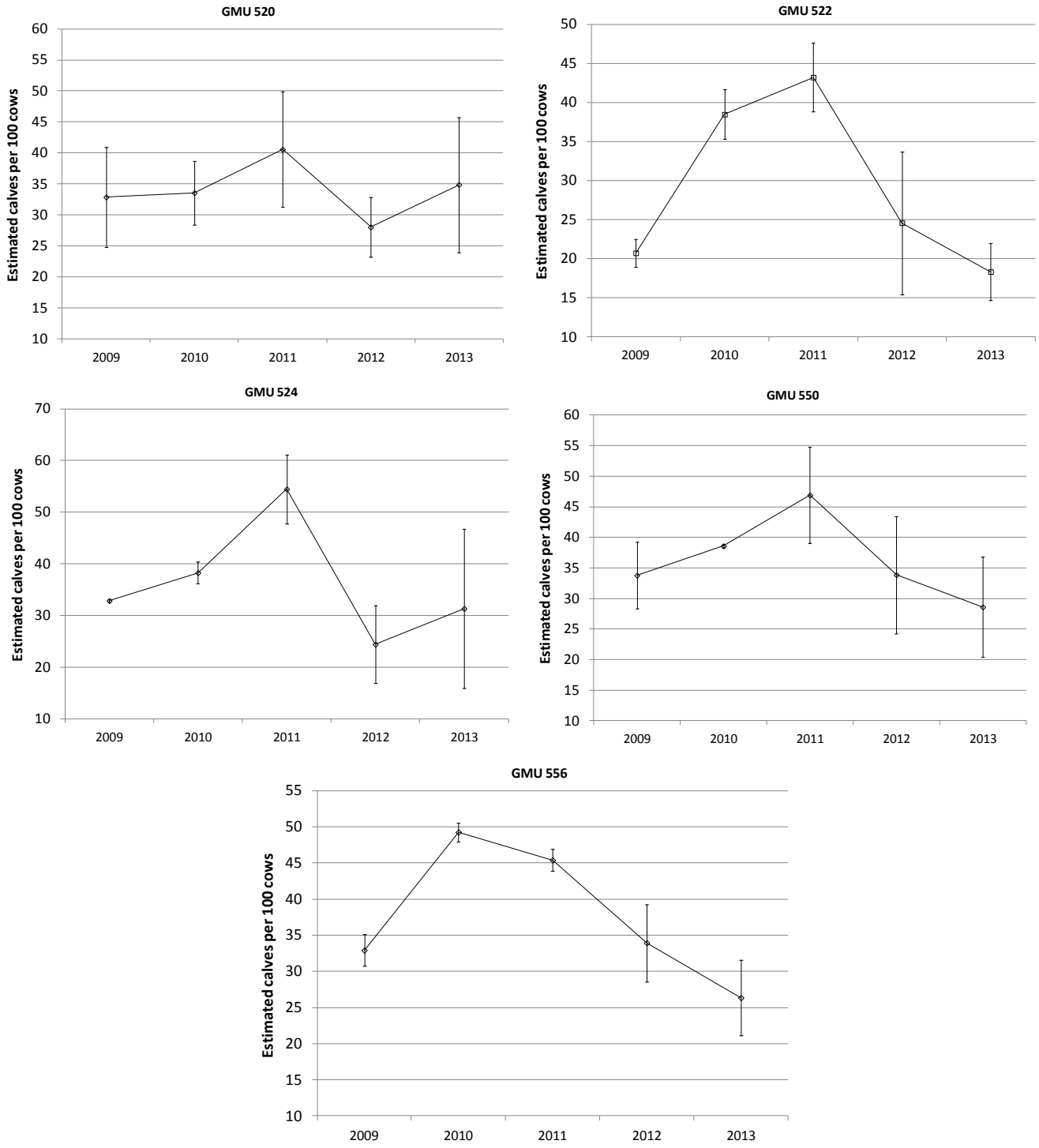

Figure 40. GMU-specific elk calf-cow spring ratio estimates (plus 95% CI), 2009-2013, from aerial surveys, Mount St. Helens, WA.

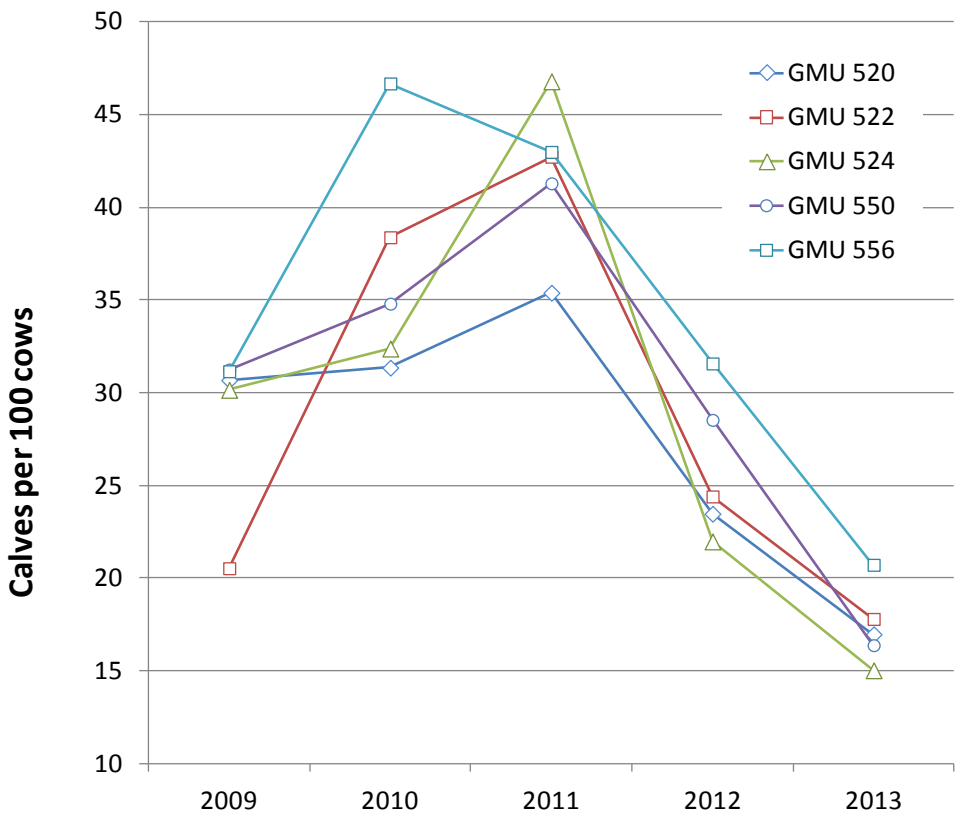

Figure 41. GMU-specific elk calf-cow spring ratio index (observed ratio adjusted for fall antlerless harvest), 2009-2013, Mount St. Helens, WA.

Survival

Over the course of the study, the sample sizes of elk at risk were relatively similar during the last 3 survival years; the sample of radiomarked elk was smaller in the first survival year in our analysis. We documented the deaths of 79 radiomarked elk (Fig. 42). Deaths per year ranged from 14 (2009-2010) to 31 (2012-2013). The numbers of elk killed by hunters were relatively stable (*n* = 9-13) across years, but the number of elk dying of natural causes was much higher in the last year of the study than in the first 3 years (Fig. 42). The results suggested that the final survival year (2012-2013) was typified by a particularly high loss of radiomarked elk, relative to other years. The

natural mortalities during 2012-2013 were spread across all 5 GMUs (*i.e.*, were not limited to mudflow elk).

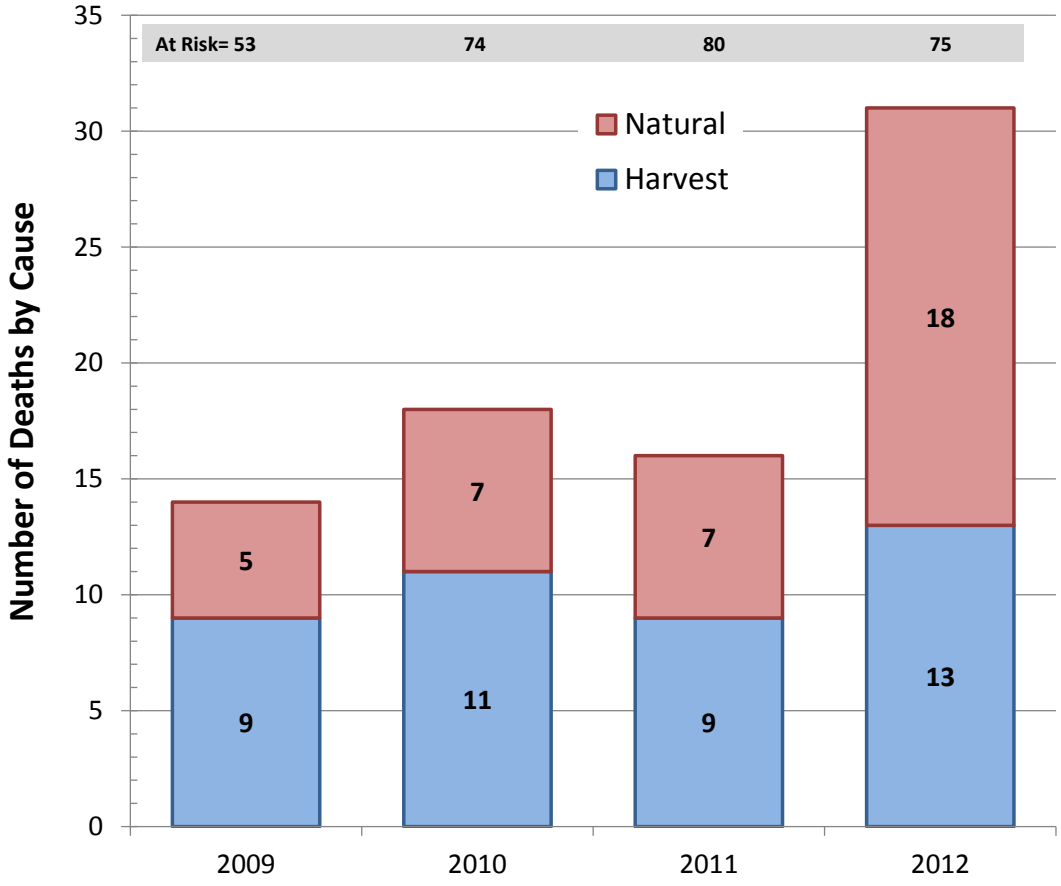

Figure 42. Total radiomarked elk deaths by cause, Mount St. Helens, Washington, survival years 2009-2012. Sample size of collared elk at risk at the beginning of each survival year is shown at the top of the panel.

Among the candidate models in our survival model set, 2 models accounted for 68% of the available model weight; the best model accounted for 50% of the weight and the next best model garnered 18% of the model weight (Table 11). The best model had a common cow survival parameter for GMUs 520, 522, 524, and 556 that was constant during 2009-2011, a common cow survival parameter for all GMUs during the last survival year (2012), a unique survival parameter for GMU 550 cows during 2009-2011, and constant bull survival across years. The second-best model differed only in that it

had a unique 2012 survival parameter for GMU 550 cows. All of the remaining models were at least 2.88 AIC*c* units from the best supported model and were not competitive with the best-supported model.

Table 11. Model selection results for radiomarked elk survival, Mount St. Helens, 2009-2013.

Model	k^a	ΔAIC_c^b	w_i^c	Deviance
Ad F (year,GMU $model_1^d$), Ad M (.)	4	0.00	0.50	26.63
Ad F (year,GMU $model_2^e$), Ad M (.)	5	2.07	0.18	26.61
Ad F (year,GMU $model_3^f$), Ad M (.)	7	2.88	0.12	23.22
Ad F (year,GMU $model_2$), Ad M (2012≠else)	6	4.10	0.06	26.55
Ad F (year,GMU $model_3$), Ad M (2012≠else)	8	4.95	0.04	23.16
Ad F (2012≠else), Ad M (.)	3	4.96	0.04	33.66
Ad F (year,GMU $model_4^g$), Ad M (.)	5	6.02	0.02	30.57
Ad F (2012≠else), Ad M (2012≠else)	4	6.96	0.02	33.59
Ad F (year,GMU $model_5^h$), Ad M (.)	4	7.01	0.01	33.64
Ad F (year,GMU $model_6^i$), Ad M (.)	5	8.21	0.01	32.76
Ad F (year), Ad M (year)	8	13.80	0.001	32.01
Ad F (year,GMU $model_7^j$), Ad M (.)	5	14.87	<0.001	39.42
Ad F (.), Ad M (.)	2	17.65	<0.001	48.39
Ad F (GMU), Ad M (.)	6	20.65	<0.001	43.10
Ad F (year,GMU), Ad M (year)	24	27.32	<0.001	08.96

[a]Number of unique parameters in model.

[b]AIC_c difference between best model and $model_i$.

[c]Akaike model weight.

[d]GMU_{all} 2012≠$GMU_{520,522,524,556}$ 2009-2011≠GMU_{550} 2009-2011.

[e]GMU_{550} 2012≠GMU_{else} 2012≠$GMU_{520,522,524,556}$ 2009-2011≠GMU_{550} 2009-2011.

[f]GMU_{550} 2009≠2012≠2010=2011≠GMU_{else} 2009≠2012≠2010=2011.

[g]GMU_{520} 2012≠GMU_{else} 2012≠$GMU_{522,524,550,556}$ 2009-2011≠GMU_{520} 2009-2011.

[h]GMU_{550} 2012≠GMU_{else} 2012≠GMU_{all} 2009-2011.

[i]$GMU_{520,550}$ 2012≠ GMU_{else} 2012≠$GMU_{520,550}$ 2009-2011≠GMU_{else} 2009-2011.

[j]GMU_{550} 2011=2012≠ GMU_{else} 2011=2012≠GMU_{550} 2009-2011≠GMU_{else} 2009-2011.

Model-averaged annual survival estimates were modest (0.84-0.86) for adult cows in GMUs 520, 522, 524, and 556 for the 3 survival years beginning in 2009-2011 (Table 12). Estimated cow survival was substantially lower (0.52) across those GMUs in the survival year beginning in 2012, and was relatively low (0.51- 0.66) in all 4 years for GMU 550 cows (Table 12). Estimated annual survival for branch-antlered bulls was 0.55-0.56 across years. Most survival estimates were relatively precise, but estimated cow survival for the last survival year and estimates across years for GMU 550 cows had relatively wide confidence intervals. Under the best supported model from Table 11, annual cow survival was estimated to be 0.85 (95% CI = 0.78-0.91) during 2009-2011 in GMUs 520, 522, 524, and 556. During the same years, cow survival was estimated at 0.64 (95% CI = 0.48-0.78) in GMU 550. Under the best model, cow survival in the final survival year (2012-2013) was estimated to be 0.52 (95% CI = 0.38-0.65) across all 5 GMUs. Branch-antlered bull survival under the best model was estimated to be 0.56 (95% CI = 0.43-0.67) across years.

Table 12. Model-averaged annual survival estimates (*S*-hat) and associated unconditional 95% confidence intervals for radiomarked Mount St. Helens elk for 4 survival years using the models and Akaike model weights from Table 11. All estimates are for radiomarked adult cow elk, unless specified otherwise.

Year	GMU	*S*-hat	95% CI for *S*-hat
2009	520	0.86	0.73-0.93
2010	520	0.84	0.75-0.91
2011	520	0.84	0.75-0.91
2012	520	0.52	0.38-0.66
2009	522	0.86	0.73-0.93
2010	522	0.84	0.75-0.90
2011	522	0.84	0.75-0.90
2012	522	0.52	0.38-0.66
2009	524	0.86	0.73-0.93
2010	524	0.84	0.75-0.90
2011	524	0.84	0.75-0.90
2012	524	0.52	0.38-0.66
2009	550	0.64	0.41-0.82
2010	550	0.66	0.47-0.82
2011	550	0.66	0.47-0.82
2012	550	0.51	0.28-0.74
2009	556	0.86	0.73-0.93
2010	556	0.84	0.75-0.90
2011	556	0.84	0.75-0.90
2012	556	0.52	0.38-0.66
2009	BA bulls[a]	0.56	0.43-0.68
2010	BA bulls	0.56	0.43-0.68
2011	BA bulls	0.56	0.43-0.68
2012	BA bulls	0.55	0.41-0.69

[a] Branch-antlered bulls.

Hoof Disease Observations

Although elk hoof disease remains an extremely important management issue in southwest Washington, our study's scope did not include evaluating the condition's etiology, prevalence, or distribution. As described in the Methods section, the elk marking and monitoring design also was not intended to quantify the condition's specific effects on elk population dynamics nor its long-term implications for elk management. Limited information, however, was obtained regarding the short-term fates of elk that had various presentations of hoof pathology when we captured them for radiomarking (inadvertently). During 2009-2012, we handled 16 elk with some hoof irregularity (Table 13). The hoof issues we observed ranged from minor overgrowth of the keratinized portion of the hoof (often colloquially called "elf slipper" or "scissor hooves") to substantial ulceration (typically between the toes). Most of the elk we handled with hoof issues did not die in the very near-term, typically surviving for at least a year or more; several survived for the duration of the study or the duration of the time we were able to monitor their fates (*i.e*., until collar drop for GPS-instrumented elk) (Table 13).

Because of increasing concerns about the prevalence of hoof disease during the latter portion of our study and because we detected a substantial number of previously unreported mortalities of radiomarked elk just prior to our last surveys associated with this study (spring 2013), we attempted to locate the carcasses of all radiomarked elk transmitting mortality signals as of April 2013, following our survey flights. Of the 19 elk transmitting mortality signals, 1 was located at a residence (*i.e*., unreported harvest) and 6 had been dead too long to reliably determine cause of death (*e.g*., could not rule out wounding loss from fall 2012 hunting seasons). Of the remaining 12, a minimum of 9 showed physical evidence of malnutrition, and malnutrition was suspected as the cause of death for the other 3 based on time-of-death and location; 3 of the 9 elk known to have succumbed to malnutrition had moderate-to-severe hoof disease (2 had 2 foot involvement, 1 had a single affected hoof), and 2 had a minor hoof deformity on 1 foot. Thus, among the mortalities of radiomarked elk we investigated in April 2013, most appeared to be linked to malnutrition. A small number of these instances may have

involved hoof disease as a contributing factor, but most apparently were unrelated to any hoof affliction.

Table 13. Fates of elk with any visible hoof issue at capture among those elk radiomarked 2009-2012, Mount St. Helens, WA.

Marked	Condition	Fate
Feb 2009	Moderate hoof disease	Hunter-kill fall 2009
Feb 2009	Moderate hoof disease	Survived winter ‘09-‘10; dead by spring 2011
Feb 2009	Scissor hooves	Survived until winter ’12-‘13
Feb 2009	Scissor hooves	Contact lost winter ’11-’12; alive until then
Feb 2009	Scissor hooves	Still alive as of spring 2013
Feb 2009	Scissor hooves	Hunter-kill fall 2009
Feb 2009	Scissor hoof	Hunter-kill fall 2009
Feb 2009	Clubbed hoof	Hunter-kill fall 2009
Feb 2009	Scissor hoof	Hunter-kill fall 2010
Feb 2011	Moderate hoof disease	Alive at GPS collar drop May 2012
Feb 2011	Moderate hoof disease	Alive at GPS collar drop May 2012
Feb 2011	Moderate hoof disease	Alive at GPS collar drop May 2012
Feb 2012	Severe hoof disease	Still alive as of spring 2013
Feb 2012	Moderate hoof disease	Still alive as of spring 2013
Feb 2012	Moderate hoof disease	Still alive as of spring 2013
Feb 2012	Severe hoof disease	Survived winter ’11-’12; missing by spring 2013

Environmental Effects

Among potential response variables, we found significant correlations between observed calf ratio and the harvest-corrected calf ratio index (r = 0.99, P = 0.001), between the overwinter mortality index and both the observed calf ratio (r = -0.81, P = 0.10) and the calf ratio index (r = -0.82, P = 0.09), and between fall IFBF estimated from harvested cow elk organ sets and both the observed calf ratio (r = 1.0, P = 0.001) and the calf ratio index (r = 1.0, P = 0.03). We did not find significant correlations between

the overwinter mortality index and either fall IFBF from the organ sets (r = -0.60, P = 0.59) or mid-winter IFBF estimated for live-captured elk (r = 0.62, P = 0.38); mid-winter IFBF for live elk was also not correlated with observed calf ratios (r = -0.03, P = 0.97), the corrected calf ratio index (r = 0.03, P = 0.98), or the fall IFBF estimates from harvested elk organs (r = 0.25, P = 0.84). Among these response variables, the organ-based fall estimates of IFBF represented only 3 data years, so the correlations involving those data derived from only 3 bivariate data points.

Live elk IFBF estimates were not significantly correlated with any of the spring-summer-fall precipitation metrics (r = -0.35-0.68, P = 0.33-0.96). Live elk IFBF, was also not correlated with early winter SWEs (r = 0.80, P = 0.20) and the sign of this nonsignificant correlation coefficient for the relationship was nonsensical (*i.e*., as early winter snowfall increased, mid-winter body fat estimates increased). Based on only 3 data points (*i.e*., years), fall IFBF derived from harvested elk organ sets was correlated with the slope of a fitted regression line to late summer-fall precipitation (r = 1.0, P = 0.07, and the sign of the relationship was sensible), but was not significantly correlated with early summer precipitation (r = 0.62, P = 0.58), total late summer-fall precipitation (r = 0.90, P = 0.29), or total spring-summer-fall precipitation (r = 0.85, P = 0.35).

The observed calf ratios and the calf recruitment indices were strongly related to late summer-fall precipitation; annual calf recruitment was higher in springs with greater precipitation (and the rate of daily precipitation accumulation) occurring during the previous late summer and early fall (Fig. 43). More than 90% of the variation in the annual calf recruitment indices was explained by the late summer-fall precipitation metrics. The spring calf recruitment metrics were not correlated with early summer precipitation (r = 0.21-0.25, P = 0.69-0.74) or with total spring-summer-fall precipitation (r = 0.65-0.69, P = 0.20-0.23). Likewise, calf recruitment was weakly correlated with SWEs for the early winter (r = -0.33 to -0.37, P = 0.54-0.59), late winter (r = -0.37 to -0.43, P = 0.47-0.54), and full winter periods (r = -0.33 to -0.38, P = 0.52-0.59).

The overwinter mortality index was poorly correlated with the previous early summer (r = -0.49, P = 0.33), late-summer fall (r = -0.30, P = 0.57) and total spring-summer-fall precipitation (r = -0.53, P = 0.28). Overwinter mortality was, however,

correlated with late winter and full winter SWEs (r = 0.87, 0.81; P = 0.02, 0.05). Overwinter mortality was not as strongly correlated with early winter SWEs (r = 0.66, P = 0.16). Overwinter mortality appeared to be related (P = 0.03) to late winter snowfall nonlinearly (Fig. 44), although a linear fit was also significant (r^2 = 0.86, P = 0.008).

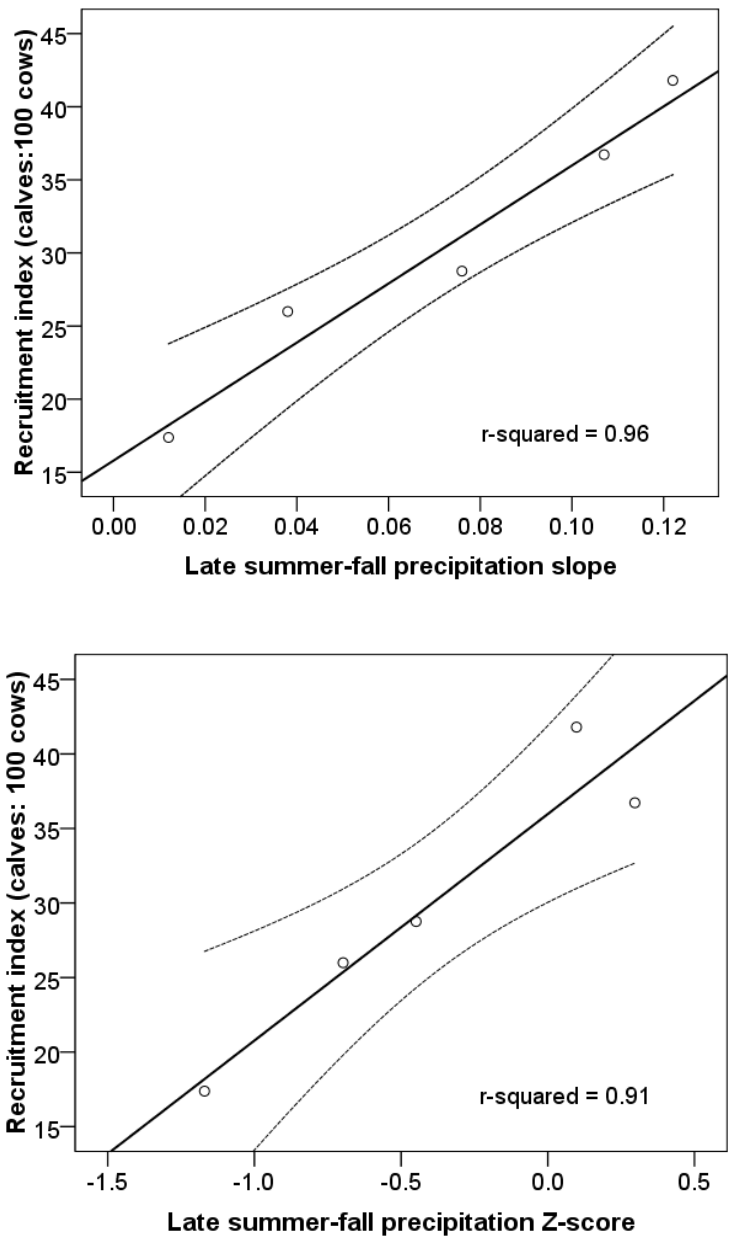

Figure 43. Linear fits of indexed spring calf-cow ratio to late summer-fall precipitation metrics, Mount St. Helens elk herd, 2009-2013.

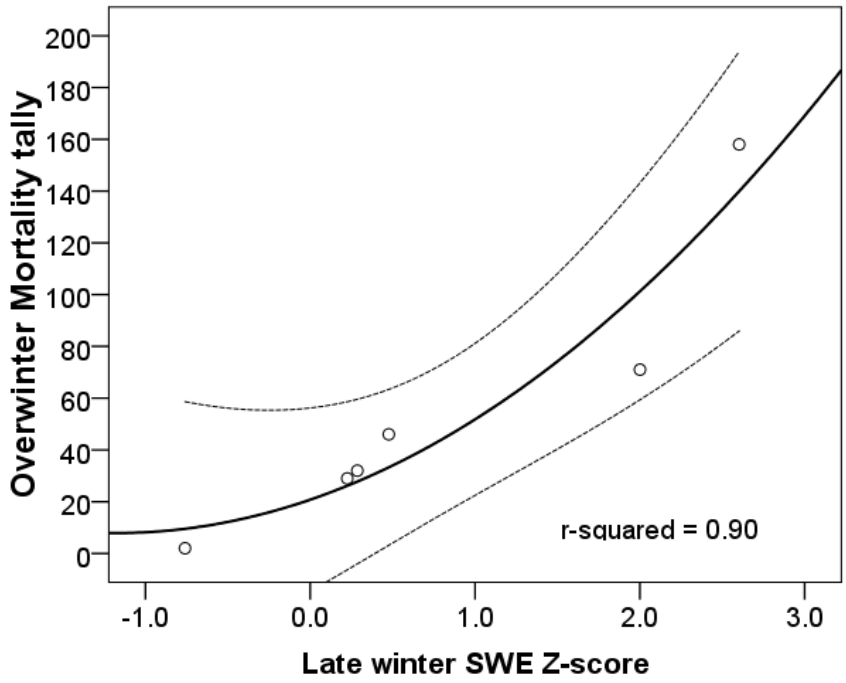

Figure 44. Non-linear fit of a spring overwinter mortality index to Z-scores for late winter snow water equivalents (SWE) measured at Spirit Lake, 2008-2013.

Combining the Z-scores for winter and previous late summer-fall weather severity (*i.e.*, relative winter snowfall and late summer-fall droughtiness) into a cumulative weather severity index did not improve the fit (*i.e.*, did not increase the r^2) to spring calf recruitment or overwinter mortality indexed in the spring (Fig. 45). Assuming the linear model, the residuals for the calf ratio index in 2011 and the mortality indices in 2008 and 2013 were larger than expected (Fig. 45). Because spring calf:cow ratios were unavailable prior to survey modifications made under this study, no data were available prior to the spring of 2009. The overwinter mortality survey predated our study, so an additional year of data (*i.e.*, spring 2008) was available for overwinter mortality relative to calf recruitment (Fig. 45).

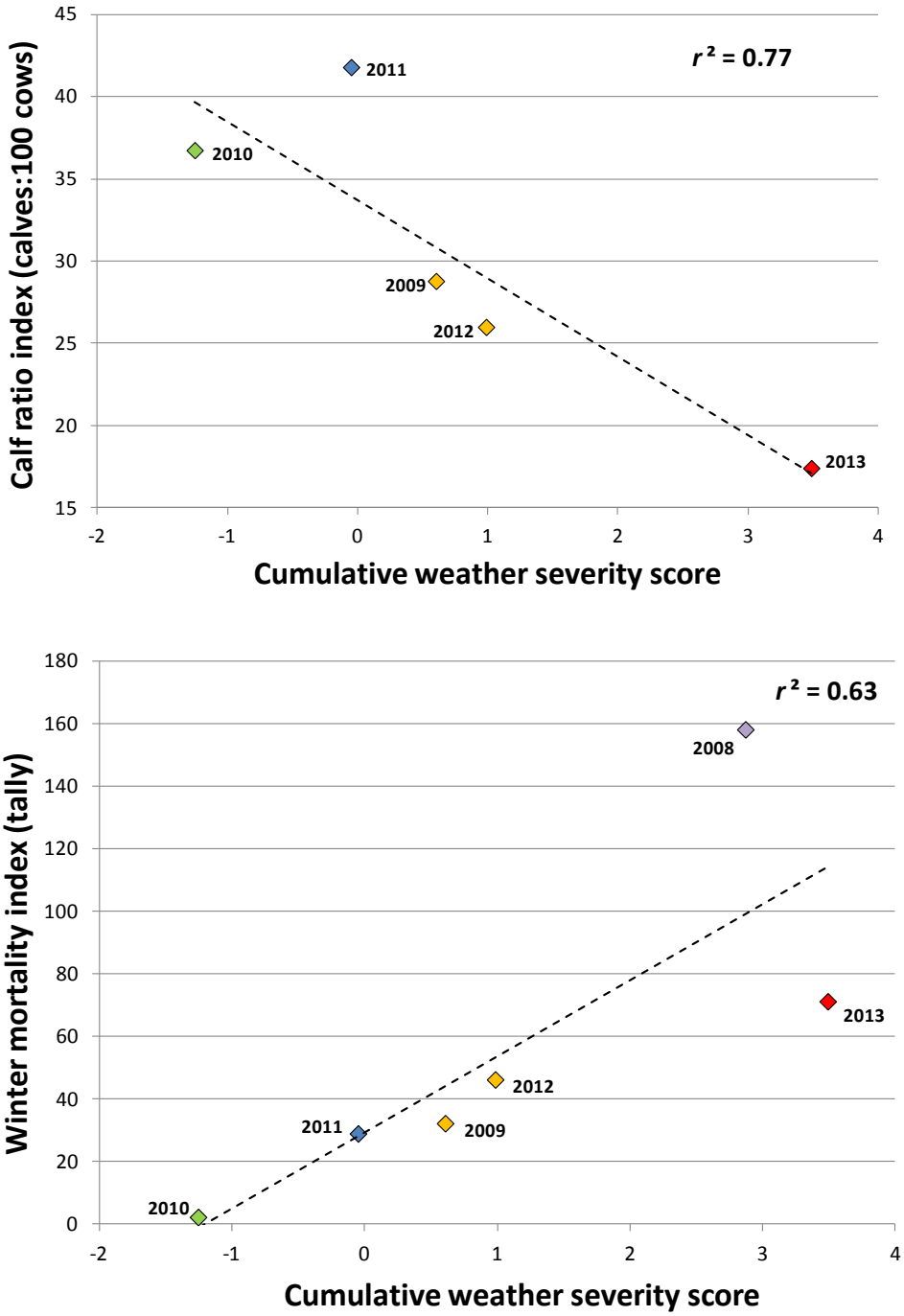

Figure 45. Linear fit of spring calf recruitment and overwinter mortality tallies to a combined index of current winter and previous late summer-fall weather severity. Marker colors: green = mild winter following normal summer; blue = normal winter and summer; yellow = normal winter and wet summer; purple = severe winter and normal summer; red = severe winter and droughty summer.

DISCUSSION

Our work was initially motivated by a need to better quantify elk abundance and demographics in the Mount St. Helens elk herd. Prior to our work, abundance estimates were attempted using the Sex-Age-Kill (SAK) model, a population reconstruction approach originally derived for white-tailed deer (*Odocoileus virginianus*) monitoring in the upper mid-west decades ago. The SAK model employs harvest data and additional demographic information (*e.g*., sex and age ratios) to reconstruct pre-harvest population size (Bender and Spencer 1999). Unfortunately, model outputs are very sensitive to assumption violations and parameter inputs that are rarely estimated well (*e.g*., the bull harvest mortality rate), often resulting in erratic performance and poor precision in the final abundance estimates (Millspaugh et al. 2009). Attempts to use the SAK model to estimate elk abundance at Mount St. Helens frequently produced biologically implausible results, and its use was eventually abandoned. (P. Miller, WDFW, personal communication).

As we initiated our work, it was apparent that the scale of the herd area made it infeasible to attempt to estimate total elk population size for the herd. Because these elk share a contiguous distribution with other elk in southwest Washington (*e.g*., Willapa Hills and South Rainier elk), the absence of a clearly defined biological population also rendered estimating total population size for the Mount St. Helens elk herd an indefensible goal. Therefore, we selected a 5-GMU subarea as our focal study area, with the intent of deriving estimates of population size or relative population size (*i.e*., an index) for this area. The 5-GMU study area represented an important core area for the Mount St. Helens elk herd that geographically captured most of the important elk management challenges for this herd (*e.g*., overwinter mortality, potentially excessive elk density, elk herbivory impacts, hoof disease). Despite that our study area was a limited subarea of the overall herd range, it was still a very large area that presented substantial challenges for quantifying elk abundance and for developing a long-term monitoring strategy.

In selecting a limited core subarea of the overall herd range, we recognized that estimates across years would be subject not only to demographic processes (*i.e*.,

natality and survival), but also movement (see Kendall 1999). Elk that were alive and present outside of our surveyed area in one year, might well be within the surveyed area boundary on a different year (see also Gould et al. 2005). Given that we surveyed elk each year in late winter / early spring, we expected movement to potentially influence our sampling year-to-year to some degree based on winter severity. This potentially added additional complexity to making inference about elk population trend, but alternatives were untenable. However, we believe the relatively large size of the area we sampled each winter reduced the effects of year-to-year movement and distribution on abundance inference, but did not eliminate these effects (see more on this below).

It was impractical, both fiscally and from the perspective of getting enough consecutive flyable weather days, to survey the entire study area with tightly spaced linear transects to obtain full, uniform coverage. Such an approach would have wasted a lot of resources flying large, heavily forested tracts where elk would be almost impossible to detect and where elk densities would be predictably very low (Starkey at al. 1982, Witmer et al. 1985, Jenkins and Starkey 1996). So, we adopted an approach wherein we attempted to fly most of the winter-occupied habitat with predictably moderate to high elk use and where elk would be at least modestly detectable. The use of an in-flight computer-based mapping system that allowed us to keep track of where we had flown and where the targeted habitat patches (*e.g.*, clearcuts, meadows/wetlands, young second-growth, hardwood stands) were located allowed us to effectively move through our counting units with good coverage of areas that met our criteria. Clearly, we missed elk that were in densely forested conifer stands, but such stands far from more open habitat with high elk forage values were presumed to harbor low numbers of elk. Conifer stands that were in close proximity to more open habitats would also hide elk, but our assumption was that these elk regularly used nearby openings for foraging (confirmed by our radio-tracking data; see also Hanley 1983); on any given set of flights, these elk were assumed to have real, non-zero probabilities of being detectable in the open habitat components adjacent to the heavier cover patches.

We explored monitoring approaches that were oriented towards large extent surveys (*i.e*., data-based) rather than modeling approaches with less emphasis on actual field sampling (see Schwarz and Seber 1999 for a good general discussion of alternative designs). Both approaches we used—sightability-correction modeling and mark-resight—assumed elk groups often had detection rates <1.0. Imperfect detectability is common in aerial surveys of wildlife, including those of elk (Caughley 1974, Bartmann et al. 1986, Pollock and Kendall 1987, Samuel et al. 1987, Steinhorst and Samuel 1989, Gould et al. 2005, Barker 2008). Ignoring detectability predictably leads to biased estimates of abundance and other demographics, and good population monitoring programs must address the detection problem (Gardner and Mangel 1996, Pollock et al. 2002, Barker 2008, Tracey et al. 2008). Both sightability-correction and mark-resight models (an adaptation of mark-recapture methods; see White et al. 1982, Pollock et al. 1990) have been used previously in conjunction with aerial surveys of large ungulates (Samuel and Pollock 1981, Bartmann et al. 1987, Bear et al. 1989, Neal et al. 1993, Bowden and Kufeld 1995, Bleich et al. 2001, White and Shenk 2001, McCorquodale et al. 2013).

Regression-based sightability correction models are appealing because they require marked animals only during model development and usually require only slight modifications to data collection methods used in traditional composition surveys. The sightability correction model we derived is structurally similar to several other previously published models for elk (Samuel et al. 1987, Anderson et al. 1998, McCorquodale 2001, Gilbert and Moeller 2008, Jarding 2010, McCorquodale et al. 2013), wherein group size positively affected detectability of elk groups and canopy cover negatively influenced detectability. These are intuitive effects and suggest elk groups are missed more often when they are small and/or are shielded from view by trees and other concealing vegetation. Previous work in western Washington indicated that sightability model estimates were substantially lower than LNME mark-resight estimates (McCorquodale et al. 2013), and we had the same result at Mount St. Helens. Underestimation seems to be a predictable result with sightability models (Freddy 1998, Barker 2008), and appears to stem from the effect of low sightability groups; the method

does not account effectively for such groups (McCorquodale et al. 2013), but sightability models have validated well where most elk have reasonably high detection probabilities (Unsworth et al. 1990).

Mark-resight modeling represents a fundamentally different approach to imperfect detectability and is based on a well-developed body of literature (Otis et al. 1978, White et al. 1982, Pollock et al. 1990, Schwarz and Seber 1999, Barker 2008). Traditional sightability models assume the probability of detecting a group is constant over time (under specific levels of predictor variables) and the probability of sighting is estimated once, during model development; whereas, in mark-resight models, the probability of detection is potentially re-estimated during each resighting occasion. Mark-resight has proven to be a relatively robust and useful method for estimating abundance of large ungulate herbivores (Gardner and Mangel 1996, White and Shenk 2001,Gould 2005, McCorquodale et al. 2013), and the LNME model has been shown to well-suited for applications such as aerial elk surveys. However, at large spatial scales, models such as the LNME tend to be very impractical. The LNME model requires replicated surveys, physically marked animals (such as radiomarked individuals) perpetually, and the effort to individually identify marked animals observed during surveys. We believe the LNME model provided reasonable estimates of elk abundance during our work, and the detection rates we estimated were sufficient to expect a mark-resight application to perform acceptably (Neal et al. 1993). We do not believe, however, that mark-resight is a practical alternative for long-term monitoring of elk abundance on this landscape for the aforementioned reasons.

Our aerial survey data and abundance estimates derived from those data (both sightability model and mark-resight estimates) suggested a decline in total elk and total cow elk abundance during our 2009-2013 study. Trends appeared to vary spatially across our study landscape. Estimated abundance clearly declined substantially for GMUs 520 and 550, the west-most GMUs in our study area. Raw counts within counting units in GMUs 520 and 550 also suggested declines in total elk and total cow elk abundance within these GMUs were most pronounced in counting units furthest west. A declining trend was also suggested by counts and abundance estimates for

GMU 524. Across these units, declining abundance was most pronounced the last 2 years of the study, and data from spring 2013 were very important in defining the trend for several estimates. Estimated rates-of-increase were more strongly negative for GMUs 520, 524, and 550 using sightability model abundance estimates relative to mark-resight estimates, but this was largely because GMU-specific mark-resight estimates were only available for 2009-2012. By the spring of 2013, attrition of radiomarked elk left too few collared individuals available to support GMU-specific mark-resight estimates; the last collaring effort had been in February 2012.

Our data did not clearly indicate a decline in elk abundance, 2009-2013, in GMU 556, although raw counts and the sightability model point estimates for total elk and total cow elk abundance in the spring of 2013 were the lowest we observed for this GMU across the years of our study. Estimated rates-of-increase for total elk and total cow elk in GMU 556 were slightly above zero, and confidence intervals on these estimates included positive values, which would not support a conclusion that elk in GMU 556 had declined during our study. In GMU 556, estimated elk abundance rose in spring 2011 and 2012 relative to 2009 and 2010, then it declined in 2013. In fitting the rate-of-increase estimate to the data, the increase in 2011 from 2010 was largely responsible for the non-negative indicated trend. Raw counts for counting units west-most in GMU 556 suggested declines across the years of our study, whereas in the other counting units within GMU 556, only 2013 data suggested a decline.

Our data implied elk abundance was stable-to-increasing in GMU 522 during our study, in contrast to other parts of the landscape. Our 2009 estimates in GMU 522 were likely artificially low relative to 2010-2013 estimates because we adjusted the boundaries of our counting unit to include areas further upstream on the North Fork of the Toutle River between the 2009 and 2010 surveys. We consistently counted slightly less or more than 1,000 elk in GMU 522, during 2010-2013. In most winters, we observed elk groups upstream on the North Fork of the Toutle River all the way to the edge of the pumice plain near the volcano. Elk were typically fewer this far upstream, but they were consistently there, even during moderate-to-severe winters. Radiomarked elk movements did indicate some elk moved into GMU 522 from adjacent

GMUs, particularly from GMUs 524 and 556, to winter on the mudflow. It was apparent that our late winter counts of elk in GMU 522 were likely more affected by immigration of elk from other GMUs, than were counts in other GMUs. Nonetheless, we had no indication that wintering elk density in GMU 522 declined during our 5-year study.

Overall, our results suggested a substantive decline in elk abundance in our 5-GMU study area, 2009-2013. However, it was apparent that most of this decline occurred on the western half of the study area (particularly GMU 550 and the western 1/2 of GMU 520). For virtually every geographic scale of abundance estimates for total elk and total cow elk, the 2013 point estimate was the lowest estimate obtained 2009-2013, except for GMU 522 estimates. For total elk and total cow elk across the 4-GMU landscape (excluding GMU 522), 2013 estimated abundance was on the order of 30-35% lower than the 2009 estimates. GMU-specific sightability model estimates of total elk and total cow elk abundance were on the order of 60-70% lower in 2013 than in 2009 for GMUs 520 and 550, were ~40-60% lower for GMU 524, and were ~20-25% lower for GMU 556.

Relative to estimating absolute abundance, it was apparent that our sightability model routinely underestimated the numbers of elk at all geographic scales, compared to mark-resight estimates. Our sightability model estimates generally were about 50-70% of comparable mark-resight estimates. It was, however, encouraging to see that estimates from both methods supported very similar inference regarding trend. There was a very high correlation between corresponding sightability model and mark-resight estimates. There were data common to both estimates in the correlation analysis, although mark-resight estimates were a function of data from both replicate surveys and sightability model estimates were replicate-specific (*i.e*., half of the data reflected in the mark-resight estimates were missing from each sightability model estimate). The way detectability was modeled in each method was also fundamentally independent; mark-resight modeled the detectability of individuals and mark-resight modeled detectability of elk groups as a function of what caused some groups to be missed. Mark-resight modeled detectability apart from any causative factor. Also, rate of increase estimates

were reasonably congruent between the 2 methods when the data times series were the same.

All of this suggested that although sightability model estimates were consistently underestimates of *absolute* abundance, the estimates supported apparently reliable trend inference. Essentially, sightability model estimates appeared to be a good index of *relative* abundance. It seems unlikely that management decisions based on a sightability model-derived index of abundance would be much different than decisions based on mark-resight estimates of absolute abundance, based on our data and analyses. Previously, sightability modeling appeared to perform erratically in northwestern Washington and was judged inferior to mark-resight (McCorquodale et al. 2013). However, the Nooksack elk population—the population that was the focus of the McCorquodale et al. (2013) work—was very small compared to the Mount St. Helens herd, and annual surveys of the Nooksack herd were characterized by only a few groups (<40 typically) being observed. When few groups are observed, the occasional detection of a group or 2 with low predicted sighting probabilities (*i.e*., supporting large model corrections) dramatically affects overall estimates of abundance derived from a sightability correction model. At Mount St. Helens, a large number of elk groups (an order of magnitude more groups than typical of Nooksack herd surveys) are observed during each survey replicate, and this reduces the influence of a small number of low sightability groups being seen, should that occasionally occur. That is, the contribution of what are essentially *outlier* groups to the overall abundance estimates are dampened when many groups are typically observed.

Estimated annual survival rates for cow elk on our study area from our best-supported survival model and model-averaged GMU- and year-specific rates across the full model set were relatively high (c. $\hat{S}$ = 0.84-0.86) except for the last survival year (2012-2013) for all GMUs and cow elk in GMU 550 in all years. Annual adult cow survival of roughly $\hat{S}$ = 0.85 would potentially support a stable to increasing population if annual recruitment of calves to yearlings was at least 30 calves per 100 cows, assuming 50% of the recruited calves were females. In a previous study (1988-1993), annual survival for radiomarked cow elk at Mount St. Helens was estimated at $\hat{S}$ = 0.82

(Smith et al. 1994). During the same study, radiomarked cow elk survival was estimated at $\hat{S}$ = 0.86 on an Olympic peninsula study area. These rates are all lower than the $\hat{S}$ = 0.93 annual survival estimated for radiomarked cow elk in northwest Washington (McCorquodale et al. 2013) for an increasing population with limited antlerless harvest and lower than estimates of $\hat{S}$ = 0.89-0.96 for Roosevelt elk in western Oregon (Cole et al. 1997). Brodie et al. (2013) explored annual survival in a meta-analysis of 2,746 radiomarked Rocky Mountain elk (*C. e. nelsoni*) across 45 populations in western North America and derived estimates ranging $\hat{S}$ = 0.85-0.91, depending on the richness of carnivore assemblages across landscapes.

Our best-supported survival models indicated substantially lower annual survival among radiomarked adult cows in GMU 550 in all years and in all GMUs during 2012-2013. These rates ($\hat{S}$ = 0.51-0.66) would be associated with a declining population under even the best calf recruitment scenarios. This analysis indicated that during the last year of our study (2012-2013), adult cow mortality was high across the entire landscape. That this effect was likely real was further evidenced by the results of the spring overwinter mortality survey; the 2013 tally was the second highest in the last decade. The low survival estimate during 2012-2013 was also congruent with declines in raw elk counts and estimates of abundance stemming from the annual aerial survey in the spring of 2013. The last year of our study (2012-2013) was associated with a relatively high snowfall winter, a droughty summer-fall prior to winter, and a relatively high antlerless elk harvest in the fall of 2012.

Our tally of losses of radiomarked elk to non-hunting mortality was much higher the last year of our study relative to other years. This was congruent with the relatively high tally of unmarked elk deaths documented during the annual mortality survey and observations of a number of recently dead unmarked elk across the larger landscape during the aerial survey in spring 2013. As noted above, the environmental conditions—poor for both summer-fall and winter conditions—were predisposing for a challenging energetics scenario for elk. Based on post-mortem examinations of both radiomarked and unmarked elk, almost all of the winter-spring deaths were due to malnutrition. Some of these elk had clinical hoof disease of varying severity, but most

did not. Our data were not suitable for definitively addressing whether the presence of hoof disease substantively raises the risk of overwinter mortality for affected elk or not; our study design was not intended to address this question. Clearly, some elk are severely debilitated by the condition—others less so—leading to a seemingly logical assumption that some additional mortality risk is likely associated with advanced disease. The only information we have, however, derived from the fates of radiomarked elk, indicated that most of the small number of these elk known to have a hoof affliction survived for an extended time.

Annual survival among branch-antlered bulls, estimated from our models, was $\hat{S}$ = 0.56. This rate was similar to an annual survival estimate ($\hat{S}$ = 0.59) for bull elk managed under *limited entry* regulations in western Washington, a harvest strategy designed to yield modest bull mortality (Bender and Miller 1999) and was higher than bull elk survival estimated during a previous telemetry study at Mount St. Helens ($\hat{S}$ = 0.49) (Smith et al. 1994). In a western Oregon study, bull survival was estimated at 0.54-0.58—very similar to our estimated survival rate—under point-restricted and any bull general season hunting regulations across 3 GMUs (Biederbeck et al. 2001). In that study, most bulls were killed before their 4th birthday. During our study, branch-antlered bull abundance appeared relatively stable across years; bull harvest regulations and permit levels were relatively static during our study, in contrast with antlerless elk permitting that was increased substantially to reduce the density of antlerless elk.

IFBF levels in late fall, estimated from hunter-harvested elk, were about 8.0% body fat for lactating elk and about 10% for non-lactating elk for most of our study area. Elk on high quality diets are capable of much higher fat accretion (Cook et al. 2004a, Bender et al. 2006, Piasecke and Bender 2009, Cook et al. 2013). On high quality summer-fall diets, even lactating elk are capable of IFBF levels in the 15-18% range in fall (Cook et al. 2004a). However, elk in western Washington and Oregon—presumably mostly Roosevelt elk or a mixed lineage of Roosevelt elk/ Rocky Mountain elk—are often strongly nutritionally limited (Bender et al. 2008, Cook et al. 2013). Among the *west-slope* elk populations for which condition data have been collected, elk at Mount

St. Helens appear to be relatively typical, based on our data from hunter-harvested elk and data in Cook et al. (2013) derived from live elk sampling via ultrasound in the fall. Fall data for live Mount St. Helens elk included in Cook et al.'s (2013) work indicate a bit lower condition than what we estimated from harvested elk, but derive from sampling only elk on the mudflow of the North Fork of the Toutle River in 2003 and 2005. In comparison to our fall estimates of ~8.0% and ~10.0% IFBF for lactaters and non-lactaters, Trainer's (1971) elk condition data, based on kidney fat indices (KFI) for a large sample of hunter-harvested elk in western Oregon, suggested mean values of about 8.50% and 13.50% IFBF (converting KFI to IFBF using the transformation in Cook et al. [2001a]). Similarly, earlier work by Merrill et al. (1985) at Mount St. Helens early in the elk recolonization phase, post-eruption indicated fall IFBF levels of ~8.0% and ~10.5% derived from KFI data for lactaters and non-lactaters. These estimates are very similar to our fall estimates, the methodological differences notwithstanding. Note, however, that Cook et al. (2001a, 2001b) have demonstrated that condition assessments derived only from KFI can be problematic because of a strongly nonlinear relationship between KFI and actual IFBF. KFI estimates appear to work reasonably well at moderate levels of IFBF, but are less reliable as an index to IFBF at both high and low IFBF levels (Cook et al. 2001b). Our mean IFBF estimates for fall, derived from hunter-harvested elk, suggested modest, but not poor condition typified elk on our study area. However, the interquartile range for fall IFBF estimates included values of ~7.0% and ~5.0% for nonlactaters and lactaters, indicating strong nutritional limitation for a substantive number of elk within our samples.

Our late winter (Feb) estimates of IFBF from live-handled elk indicated mean body fat levels of a little less than 5.0% to a little more than 6.0% for nonlactaters and a little less than 3.0% to a little more than 4.0% for lactaters. Using mean IFBF values from the fall-harvested elk and the late winter live-handled elk would suggest that Mount St. Helens elk on our study area lose about half of their fall fat stores by the end of winter. By late winter, these elk are quite lean. Based on the data from Cook et al. (2013) for wild elk populations across the western U.S., nonlactating Mount St. Helens elk are fairly typical, condition-wise, of western Washington and western Oregon elk; elk with

evidence of late-season lactation at Mount St. Helens were among the leanest relative to other coastal and west-slope elk, but sample sizes for late-season lactaters at Mount St. Helens were small (Cook et al. 2013).

We estimated the overall pregnancy rate among elk we handled in Feb, 2009-2012, at just under 70%. That is clearly a suboptimal rate for elk on a good nutritional plane (Cook et al. 2004a). Prime-aged elk with access to quality forage during summer-fall typically have pregnancy rates in the mid-to-high 90% range (Cook et al. 2001c, Cook et al. 2004a, 2013). However, coastal and west-slope elk populations in Washington and Oregon are often nutritionally limited and display suboptimal pregnancy rates. Using a large sample of reproductive tracts from harvested Roosevelt elk in western Oregon in the 1960s, Trainer (1971) estimated the pregnancy rate across cow age classes at 50%, with the highest rate (59%) for prime-aged cows (ages 4-10 yrs.). Later, Harper (1985) reported a pregnancy rate of 57% for a larger sample of reproductive tracts from western Oregon elk (included the data from Trainer 1971) ≥ 2-yrs-old and a rate of 63% for prime-aged (ages 4-10 yrs.) elk. Collectively, the data in Harper (1985) represented sampling spanning 3 decades (1960-1980s) in western Oregon. Using reproductive tracts from elk harvested in southwest Washington (Willapa Hills) during the early 1970s, Kuttel (1975) estimated a pregnancy rate of 70.3% across all cows ≥1 year-old, and a rate of 74.1% if yearling cows were excluded. Smith et al. (1980) measured pregnancy rates from harvested cow elk on Washington's Olympic peninsula and reported rates of 61.3% excluding yearlings and 53.5% across all age classes for data collected in the late 1970s. Cook et al. (2013), using ultrasound data from live-captured elk, documented pregnancy rates of 68.6-100.0% across 4 coastal elk herds in Washington and 76.9-100.0% for 8 west-slope Cascades herds in Washington and Oregon. Merrill et al. (1987) previously measured pregnancy rates for Mount St. Helens cow elk during 1982-1985 from a mixed sample of harvested and live-captured elk and reported a rate of 69% for 2-yr-olds and 87% for cows aged ≥3-yrs-old. In context, our pregnancy rate data for 2009-2012 indicated productivity on par—if not slightly better—with historic western Oregon and Washington elk data, but slightly lower than recent data for most western Washington and western Oregon Cascades elk

herds. Our data also indicated slightly depressed productivity for cow elk at Mount St. Helens in recent history, relative to the lower density elk population on the same landscape during the post-eruption, elk recolonization phase in the early to mid-1980s.

Spring calf recruitment during 2009-2013 was highly variable, according to our survey-based estimates. Calf recruitment—standardized by the abundance of adult cows—is the result of 2 demographic processes: cow elk fecundity (productivity) and 1st year calf survival. Large herbivore populations, including elk populations, are typically characterized by relatively high and consistent adult survival, but substantial annual variation in juvenile survival (Coughenour and Singer 1996, Gaillard et al. 1998, 2000, Bonenfant et al. 2002, Lubow et al. 2002, Garrott et al. 2003). Demographically, population change is most affected by adult female survival in theory, but because of relative stability in adult female survival rates, realized population fluctuations are usually associated with dynamic juvenile survival (Coughenour and Singer 1996, Lubow and Smith 2004, Raithel et al. 2007, Harris et al. 2008). Eberhardt (1977) hypothesized that declining per capita resource availability (driven either by environmental fluctuation or increasing animal density) would affect demographics of large mammal populations following a predictable pattern: 1) declining juvenile survival, 2) increasing age of primiparity (female sexual maturity), 3) declining reproductive rates of adult females, and lastly 4) declining survival of adults. This ordering reflects the expected relative sensitivity of each demographic parameter to increasing food limitation, and empirical data have largely supported this hypothesis for large herbivores (Gaillard et al. 1998, Bonenfant et al. 2002).

Our data indicated very good recruitment in the spring of 2010 and 2011, even after attempting to correct for antlerless elk harvest. During these years, we commonly estimated recruitment exceeding 35 calves per 100 cows, and for some GMU-specific estimates during 2010-2011, >40:100. Calf recruitment this high—under the pregnancy rates we documented for radiomarked cow elk—seems exceptional. During our work, we consistently tried to guard against misclassification of calves and yearlings. When large herbivores are food limited, early body growth is typically impacted (Albon et al. 1987, Loison and Langvatn 1998, Mysterud et al. 2001, Cook et al. 2004a). Variation in

calf birth mass, calf gender, maternal nutrition, and first-year growth effects combine to yield a range of calf sizes by later winter. This and nutritional effects that carry over to yearling body sizes can result in substantial overlap in the sizes of large calves and small yearlings. We attempted to avoid misclassification of calves by continually trying to calibrate our perception of yearling cow size using the sizes of yearling bulls present in the elk groups we observed. We believe we were fairly conservative to avoid overestimating the numbers of calves, but it is still likely that some misclassification error occurred. That said, post-season calf:cow ratios exceeding 35:100 have also been previously documented for other western Washington and western Oregon elk populations that had pregnancy rates ≤70% (Kuttel 1975, Smith 1980, Raedeke et al. 1982, Harper 1985). Early in the post-eruption, elk recolonization phase, Merrill et al. (1987) estimated Aug-Oct calf recruitment in the range of 40-57 calves per 100 cows at Mount St. Helens when corresponding pregnancy rates were 31% for yearlings, 69% for 2-yr-olds, and 87% for ≥3 yr-olds.

The high calf recruitment we estimated for spring 2010 and 2011 was associated with favorable annual conditions. The winter of 2009-2010 was extremely mild, nearly snow-free, and the winter of 2010-2011 was modest relative to snowfall and mild relative to early snowfall. The summer-fall of 2010 was the wettest among all of our study years, with substantial late-summer, fall precipitation. The summer-fall of 2009 was not as wet overall, but had significant late-summer, fall moisture. Thus, our highest estimates of recruitment did occur under conditions that intuitively would favor good summer foraging conditions and minimal overwinter mortality, presumably conditions favoring higher than average calf recruitment.

In contrast with the 2010 and 2011 estimates, elk calf recruitment was lower in the spring of 2009 and much lower in 2012, 2013. Overall, observed estimates were in the 25-30:100 range for the study area and in the 25-35:100 range for all GMU-specific estimates except for GMU 522 during these years. Estimates for GMU 522 during these years were slightly lower than for the other GMUs. After attempting to correct the observed ratios for removals of antlerless elk via hunter harvest—removals that were substantial in fall 2011 and 2012—calf recruitment was indexed mostly in the high teens

to 100 cows range for 2012, 2013 and in the 20-30-ish calves per 100 cows in 2009. Indexed recruitment in spring 2013 was the lowest—compared to other study years—for all GMUs except GMU 556; recruitment in 556 appeared similarly low in 2013 and 2009. Depressed calf recruitment in the spring of 2013 corresponded to high mortality among radiomarked elk that same year, high observed overwinter mortality of unmarked elk, and elk counts and abundance estimates that were also low. Weather-wise, the winters of 2008-2009 and 2012-2013 had relatively deep snow at mid-elevations, whereas the winter of 2011-2012 was relatively moderate for snow accumulation. The summer-fall of 2012 was characterized by almost no precipitation from July through September, and in 2011 overall growing season precipitation was even lower, with a droughty summer and fall rain only after mid-September. In 2009, the early summer period was very dry, but rainfall did occur throughout August and September.

We found statistical associations among several performance metrics (*e.g.*, overwinter mortality, spring calf recruitment, fall body condition of adult females) and strong associations between landscape environmental metrics and some performance metrics (notably, overwinter mortality and spring calf recruitment). The environmental metrics we used (growing season precipitation and winter snow water equivalents with various temporal constraints) were selected as proxies for summer-fall forage production/quality and winter severity with intuitive implications for elk nutrition, energetics, and survival. We detected a particularly strong association of spring calf recruitment and late summer-fall precipitation across years. When droughty conditions prevailed during this timeframe, calf recruitment was depressed relative to years with a good precipitation pulse during Aug-Sept. Elk calves increasingly consume forage by late July, as they become less dependent on nursing for nutrient and energy intake (Robbins et al. 1981, Cook et al. 1994, 1996, 2004). By September they are obtaining a substantial portion of their calories from forage (Robbins et al. 1981, Cook et al. 1996, 2004). A finding that late summer-fall precipitation—a harbinger of fall forage greenup—affects spring calf recruitment, presumably by enhancing overwinter calf survival, is intuitive. Empirical evidence from tame elk feeding trials has also clearly implied that deficient summer-fall nutrition (potentially affecting both calves and their

lactating dams) reduces overwinter survival probabilities for elk calves (Cook et al. 2004a).

We also found a striking association between winter snow water equivalents, particularly from mid-winter through early spring, and the recent historic overwinter mortality index derived from carcass counts on a portion of the N. Fork of the Toutle River mudflow. A link between winter severity and overwinter elk mortality is intuitive; however, elk often tolerate deep snow conditions and/or winter nutritional deprivation elsewhere (Leege and Hickey 1977, DelGuidice et al. 2001, Garrott et al. 2003, Cook et al. 2004b); winter survival probabilities can be robust if elk store adequate fat reserves prior to winter onset (Cook et al. 2004a, 2004b). However, at Mount St. Helens, and possibly in other mountainous areas of western Washington and Oregon, strong nutritional constraints on summer-fall range may predispose some individual elk—particularly lactaters—to substantial overwinter mortality risks during severe winters (Bender et al. 2008). It would be expected that high elk densities would exacerbate the risk (DelGuidice et al. 1991). Overwinter mortality data we used came from a limited area in a low elevation valley bottom. The strong correspondence we found between a winter severity metric and mortality likely reflected not only the effect of winter severity on survival, but also the effect of winter severity on elk distribution. During heavy snowfall years, more elk are typically observed on the mudflow (P. Miller, personal communication), presumably having moved in from surrounding higher elevation forested areas, such as from GMU 524. Movements of radiomarked elk somewhat corroborate this. In severe winters, more elk deaths are indexed on the mudflow both because the sampled area holds many elk and because certain nutritionally stressed individuals succumb.

We did not find strong associations relative to the estimates of cow elk body condition derived from live elk handling in February and other performance or weather metrics. This was not surprising, because we had relatively small samples (110 total samples across 4 years), because of unknown lactation histories by February, and because condition assessed in late winter is subject to variable overwinter condition loss, depending on an elk's fall body condition. Elk that are in better body condition in

the fall typically lose more body fat overwinter than elk in poorer condition (Cook et al. 2013, S. McCorquodale, unpublished data). Overwinter, some equilibration of body condition tends to occur for cows entering the winter at different condition levels, but this compensation is not absolute (*i.e*., does not typically erase all differences in fall condition) (Cook et al. 2004a).

Elk abundance (and density) has evolved considerably over the last century on the core landscape occupied by the modern Mount St. Helens herd. As late as the 1930s, the number of elk believed to occupy the Green, Toutle, and Kalama River drainages was less than 500 elk (Pautzke et al. 1939); only about 2,000 elk were approximated for that portion of southwest Washington roughly corresponding to the current Willapa elk herd area (Pautzke et al. 1939). Methods for estimating elk abundance were admittedly rudimentary 70 years ago, but presumably we can conclude that elk densities in this part of Washington were relatively low in the early part of the 20th century. Historic evidence of elk abundance on this landscape is sketchy, stemming from the lack of suitable methods to support valid estimates for many years, but it appears that the combination of fairly conservative elk management and active forestry across ownerships that created considerable early seral habitat (Starkey et al. 1982, Witmer et al. 1985) facilitated growth in elk distribution and density during the latter part of the 20th century. The eruption of the volcano in 1980 set the stage for a large area of forested habitat to revert to early seral habitat that was both highly preferred by elk and supported high fitness (Merrill et al. 1987). For a time, the post-eruption plant successional pattern across a portion of this landscape appeared to support both increasing elk habitat values and elk numbers, but eventually elk habitat potential and elk population trajectories diverged (Miller and McCorquodale 2006).

High elk density and declining habitat capability led to strong herbivory-driven modification to plant communities used by elk (see Riggs et al. 2000) and predictable declines in per capita forage availability and forage quality. Strong nutritional constraints for some elk on this landscape were eventually manifested as sub-par fat accretion patterns (Cook et al. 2013) and episodic overwinter mortality (Miller and McCorquodale 2006). This led to some of the management changes described earlier

in this report designed to reduce elk density. Reducing elk density was intended to decrease intraspecific food competition, increase average elk condition, and reduce overwinter mortality.

As described in this report, elk abundance did apparently decline over our 5-GMU study area during 2009-2013, and on parts of the landscape, quite substantially. We did not have data to thoroughly evaluate whether the density reduction had any appreciable effect on individual elk condition. Much of the density reduction was apparently effected during the last 2 years of our work, and we did not collect samples from harvested elk after the fall of 2011 and only handled a few cow elk for radiocollaring in Feb 2012. Clearly, a substantive winterkill during the last winter we report on (2012-2013), indicated that reducing elk density did not eliminate overwinter mortality risks, at least in the short-term. As previously noted, the droughty summer-fall of 2012 and the relatively severe 2012-2013 winter presented a poor energetic scenario for elk in this population, even at a reduced elk density.

Density-dependence, potentially operating on fecundity (*i.e*., productivity; Taper and Gogan 2002, Stewart et al. 2005), but usually through effects on non-hunting mortality (Guiness et al. 1978, Coughenour and Singer 1996, Lubow et al. 2002, 2004, Taper and Gogan 2002), is linked to the concept of ecological carrying capacity for large mammals such as elk (Fowler 1981). At high population density, intraspecific competition (both scramble and contest competition) occurs as per capita resource availability declines with predictable impacts to the most vulnerable individuals in a population (*e.g*., juveniles, senescent individuals, the infirm, those with high costs associated with reproduction). Density-dependent effects on survival have been demonstrated for juveniles in elk populations many times (Sauer and Boyce 1983, Coughenour and Singer 1996, Singer et al. 1997, Lubow et al. 2002, 2004) and similarly in conspecific red deer populations (Guiness et al. 1978, Clutton-Brock et al. 1987, Coulson et al. 1997). Density-dependent survival in adult elk has also been documented (Taper and Gogan 2002, Eggeman 2012), but less commonly (see also Sauer and Boyce 1983, Coughenour and Singer 1996). Density-dependent effects on adult female red deer have been shown to influence body size (Loison and Langvatn

1998, Mysterud et al. 2001, Bonenfant et al. 2002), but not strongly survival (Clutton-Brock et al. 1985, Bonenfant et al. 2002, but see Forchhammer et al. 1998) or age of senescence (Mysterud et al. 2001).

Density-independent effects on survival, typically mediated through weather influences on energetics, have also been demonstrated for juvenile elk (Singer et al.1997, Garrott et al. 2003, Lubow et al. 2002, Lubow and Smith 2004, Eberhardt et al. 2007) and even adults (Sauer and Boyce 1983, Coughenour and Singer 1996, DelGuidice et al. 2001, Garrott et al. 2003). Irrespective of population density, the effects of poor forage years and/or severe winters can apparently often reduce survival of juveniles and, sometimes, that of adults.

Our work implied logical causal links between density-independent effects of extreme weather (both summer-fall and winter) and calf recruitment and adult survival. These effects may have been exacerbated by density-dependent influences, but we cannot unequivocally demonstrate this. Overwinter mortality during the last year of our work, although high under the combination of a droughty summer-fall and a severe winter, was substantially lower than in the spring before our work began (2008), also a year with a droughty summer and a relatively snowy winter. The much lower apparent overwinter mortality in spring 2013, relative to 2008, occurred after the documented reduction in elk population size. Whether or not the change in elk density had anything to do with the differences in the overwinter mortality index between spring 2013 and 2008 is unclear, due to the absence of relevant corroborating data prior to the initiation of our work in 2009.

Reducing the elk population within our core study area was a logical prescription, given evidence of strong food limitation effects on elk body condition, modest pregnancy rates, strong herbivory effects on plant communities, and episodically high overwinter mortality. The degree to which a lower elk density will yield the desired improvements across these parameters is likely yet to be seen. Although the elk population has been reduced, it is reasonable to expect there may be some time lag associated with subsequent changes to elk habitats, and ultimately, to the restructured elk population. Although the relatively wet southwest Washington climate produces substantial

herbaceous biomass, particularly in early seral habitats preferred by elk, the proportion of this biomass that represents nutritious and palatable elk forage is actually quite small (Cook 2002, Geary 2013, J. Cook, unpublished data). Herbivory strongly influences the structure and composition of plant communities used by foraging elk (Augustine and McNaughton 1998, Riggs et al. 2000, Geary 2013), typically by reducing the density and biomass of preferred forage species and increasing the proportion of the plant community represented by species elk do not consume, or consume only as forages of last resort. These plant community changes can be dramatic under high levels of herbivory sustained for long periods, such as has likely occurred in highly preferred elk habitats at Mount St. Helens. Recovery of the herbaceous component, which has been depressed by herbivory, typically takes some time even after the plant community has been released from excessive herbivory. This has clearly been demonstrated elsewhere for red deer (Tanentzap et al. 2009). How long substantive recovery of palatable elk forage species is likely to take in these impacted habitats is difficult to predict, but it is unlikely to be immediate or very short-term.

Forsyth and Caley (2006) recently discussed what they termed "*the irruptive paradigm*" relative to large herbivores; this paradigm postulates that when released from harvest control, large herbivore populations characteristically grow past ecological carrying capacity, subsequently decline to a much reduced density, and then recover to a relatively stable density somewhat lower than the pre-crash high density. It is not clear if the Mount St. Helens elk herd actually exceeded ecological carrying capacity, despite some evidence of density-dependent effects on elk condition, and possibly, mortality. The density reduction that has recently occurred was also directed by management actions, not imposed solely by environmental constraints.

Other high-density elk populations have been associated with strong apparent herbivory-mediated habitat modification and have been surmised to be at or above ecological carrying capacity. For decades, the northern Yellowstone elk herd was managed within Yellowstone National Park under a *natural regulation* paradigm (Coughenour and Singer 1996); elk abundance rose substantially (Houston 1982, Eberhardt et al. 2007), herbivory modification to plant communities was apparent

(Houston 1982, Frank and McNaughton 1992), and population demographics were shown to be influenced by both density-dependent and density-independent processes (Houston 1982, Coughenour and Singer 1996, Singer et al. 1997, Taper and Gogan 2002). Occasional winterkills have historically occurred, mostly affecting juvenile elk (Houston 1982, Eberhardt et al. 2007); despite these observations, the evidence that these elk exceeded ecological carrying capacity prior to wolf (*Canis lupus*) reintroduction was considered equivocal, perhaps except for the short-term right after the large-scale fires of 1988 (Houston 1982, Frank and McNaughton 1992, Coughenour and Singer 1996b, DelGuidice et al. 2001, Taper and Gogan 2002).

Similarly, a high density elk population in and around Rocky Mountain National Park was previously surmised to exceed ecological carrying capacity, as evidenced by a strong herbivory signature on some plant communities, occasional winter losses of elk, and density-correlated variability in population growth rates (Lubow et al. 2002, Singer et al. 2002). However, Bender and Cook (2005) found considerable variability in individual elk condition, the population consisting of some elk at very high condition levels, some at low levels, and the average condition modest. This would seem to be similar to the recent situation at Mount St. Helens, in light of our data from hunter-harvested and live captured elk. Bender and Cook (2005) argued that the presence of elk at very high levels of condition, even if that did not typify most elk, did not support a conclusion that the population was above ecological carrying capacity at a landscape level.

A prudent near-term goal at Mount St. Helens would seem to be to continue to manage the elk population at a lower density with the objectives of promoting improved habitat condition, higher average elk condition, and reduced overwinter mortality. Again, such outcomes may operate with a time lag reflecting an evolving plant community response to reduced herbivory. Such management may well dampen the influence of density-independent effects—such as weather—on calf recruitment and overwinter mortality, but it is unlikely to completely eliminate sub-par recruitment and overwinter mortality in years with very unfavorable conditions. The degree to which the presence of hoof disease in this elk herd will complicate meeting management

objectives is unclear, pending additional research to disentangle the effects of the condition on elk energetics and population processes such as age-specific mortality and fecundity.

MANAGEMENT IMPLICATIONS

Our results indicated that sightability correction modeling yielded a useful elk abundance index that should perform acceptably to support management decisions about elk in the west-central portion of the herd area. This approach will undoubtedly underestimate true elk numbers, but applied at a relatively large geographic scale, the index appears to correlate well with actual elk numbers across a range of abundance. Emerging approaches, such as integrated population models (Buckland et al. 2000, White and Lubow 2002, Newman et al. 2006), may provide potential future direction that would facilitate the use of sightability model estimates as inputs to a modeling approach supporting inference about actual elk densities. Sightability modeling, applied to aerial survey data, is both practical and cost-effective.

Our work confirmed that the Mount St. Helens elk herd, at least that portion inhabiting our 5-GMU study area, has been food limited in recent time. Although this is consistent with data for other elk herds in western Washington and Oregon, under certain environmental conditions and elk densities encountered during 2009-2013, food limitation in this herd yielded occasionally substantial overwinter mortality. Reducing elk density was a logical management response, and was achieved via liberalized antlerless elk hunting. It is unclear to what degree reducing elk density will affect elk survival in years with poor weather conditions in the immediate short-term. It is anticipated that plant community recovery in habitats exploited heavily by elk in the past will likely evolve at an unknown, but longer time scale. Periodic sampling of organ sets from hunter-harvested elk would provide a mechanism to monitor for habitat-mediated changes in elk condition levels through time.

Population dynamics in the Mount St. Helens elk herd appear to have been influenced both by density-dependent and density-independent mechanisms in recent time. There is also presumed to be an interaction between these effects (i.e., density-

independent effects should be magnified at higher elk densities). Managing for a lower density elk herd is expected to modify the population level effects of elk density on intraspecific competition for food, but is unlikely to completely mitigate for density-independent effects of poor forage years (i.e., droughts) and/or severe winters.

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ASSESSING THE POTENTIAL EFFECTS OF TREPONEME ASSOCIATED HOOF DISEASE (TAHD) ON ELK POPULATION DYNAMICS IN SOUTHWEST WASHINGTON

PROJECT UPDATE
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INTRODUCTION

Various hoof diseases have been reported worldwide in numerous free-ranging ungulates, including elk (*Cervus elaphus*; Murie 1930, Gray et al. 2001, Thorne et al. 2002), mule deer (*Odocoileus hemionus*; Wobeser et al. 1975), white-tailed deer (*O. virginianus;* Sleeman et al. 2009), moose (*Alces;* Flynn et al. 1977, Clauss et al. 2009), fallow deer (*Dama*; Lavin et al. 2004), reindeer (*Rangifer tarandus*; Handeland et al. 2010), roe deer (*Capreolus*; Handeland and Vikøren 2005), and mouflon (*Ovis gmelini musimon*; Volmer et al. 2008). Reports of elk in southwestern Washington with evidence of lameness or various hoof abnormalities were historically sporadic and infrequent. In early 2008, however, the number and geographic extent of elk displaying evidence of an apparently novel hoof disease significantly increased (Mansfield et al. 2011, WDFW unpublished data).

The emergence of this disease in southwest Washington elk herds is unique in that bacteria in the genus *Treponema*, (aka "treponemes"), never previously associated with hoof diseases in any free-ranging ungulate, have been identified as causal (Clegg et al. 2015). Treponemes are strongly associated with similar diseases of domestic livestock: bovine digital dermatitis of cattle (Evans et al. 2009), contagious ovine digital dermatitis (CODD) of domestic sheep (Sayers 2009), and a CODD-like disease of domestic goats (Sullivan et al. 2015).

Elk affected by treponeme-associated hoof disease (TAHD) often have severely overgrown and deformed hooves with sole ulcers and sloughed hoof walls (Han and Mansfield 2014). TAHD can occur in multiple limbs and can affect all age and sex classes (Clegg et al. 2015). The severity of clinical signs, coupled with the seemingly rapid expansion of impacted areas, have generated a great deal of concern for the Washington Department of Fish and Wildlife (WDFW), other resource management agencies, hunters, tribes, and local citizens. In response to these concerns, WDFW continues to work with several specialists to better understand the etiology of TAHD. In addition, WDFW established a Hoof Disease Technical Advisory Group (HDTAG) and a Hoof Disease Public Working Group (HDPWG). The HDTAG has guided the diagnostic effort, identified research needs, and provided review and input to management options. The HDPWG has provided input to management and research options and serves as a venue for WDFW to share information with the public. However, it is difficult to assess what implications TAHD will have for the management of affected elk herds because the effects of TAHD on elk vital rates (e.g., survival, reproduction, etc.) are unknown.

It is reasonable to assume that elk with advanced stages of TAHD have a decreased probability of survival because their infirmities may predispose them to predation, harvest, severe weather events, or other types of disease (Bender et al. 2008). For example, mule deer with chronic wasting disease (CWD), prior to developing obvious clinical signs, have been shown to be more vulnerable to predation (Miller et al. 2008, Krumm et al. 2009), vehicle collisions (Krumm et al. 2005), and possibly harvest (Conner et al. 2000). This is an important consideration because the growth rate of large ungulate populations, such as elk, is highly sensitive to changes in adult female survival (Nelson and Peek 1982, Eberhardt 2002) and strongly correlated with the production and survival of juveniles (Gaillard et al. 2000; *see also* Smith and Anderson 1998, Raithel et al. 2007). When adult female and juvenile survival are concurrently reduced, populations would be expected to decline (Gaillard et al. 2000; *see also* Bender et al. 2007, McCorquodale et al. 2014). Consequently, if TAHD reduces the survival of adult females and calves, it has the potential to have a negative effect on the population dynamics of impacted elk herds.

Although McCorquodale et al. (2014) monitored 16 adult female elk that had varying degrees of presumed TAHD (i.e., they had varying degrees of hoof deformities, but no lab samples were collected and tested) inferences from their work are limited. Twelve of 16 affected elk they monitored survived ≥ 1 year and of those that did not survive ≥ 1 year, all were harvest-related mortalities. In addition, 3 of 4 elk that were fitted with VHF collars that had a battery life of several years survived until radio contact was lost 3-4 years after they were captured. Anecdotally, this indicates that if TAHD negatively affects the natural survival of elk, it may take several years before it does so. We need to improve our understanding of how quickly TAHD progresses and if, and when, it may begin to predispose affected elk to mortality.

TAHD may also have the potential to affect the population dynamics of impacted elk herds because of its effect on the energy dynamics of female elk. The nutritional condition of female ungulates can influence age at first breeding (Cook et al. 2004), timing of estrus and subsequent birth date (Andersen and Linnell 1998, Cook et al. 2004, Bishop et al. 2009), probability of conception (Cook et al. 2004, Cook et al. 2013), fetal development and survival (Verme 1969, Ozoga and Verme 1982), birth weight (Verme and Ullrey 1984, Keech et al. 2000, Lomas and Bender 2007), milk yield or composition (Landete-Castillejos et al. 2003, Tollefson 2007), and subsequent growth and survival of juveniles (Clutton-Brock et al. 1982, Bishop et al. 2009). For example, elk from the Mount St. Helens elk herd area (MSH) and other coastal regions of Washington are

characterized by pregnancy rates for prime-aged females that are consistently depressed [Kuttel 1975 (74%), Smith 1980 (61%), Cook et al. 2013 (68-100%), McCorquodale et al. 2014 (71%)] because marginal nutrition limits the level of condition female elk are able to achieve during the summer-autumn period (Cook et al. 2013). Due to the additional energetic requirements for mounting an immune response and for tissue repair (Deming 2009), TAHD may further limit the ability of affected elk to improve their condition during the summer-autumn period and therefore has the potential to reduce overall pregnancy rates even further, which could reduce demographic vigor.

Some have attributed recent declines in the MSH elk herd to TAHD because the monitored portions of the MSH herd declined by 30-35% over a 4-year period (2009–2013; McCorquodale et al. 2014) that coincided with an increase in the prevalence and distribution of the disease (WDFW, unpublished data). However, this period of population decline also occurred concurrently with a directed effort by WDFW to reduce the elk population through substantial increases in antlerless harvest because of evidence that the MSH elk herd was above ecological carrying capacity (WDFW 2006, McCorquodale et al. 2014). Moreover, density independent severe winter weather that occurred in 2012 likely contributed to the documented decline (McCorquodale et al. 2014). Because these three events overlapped temporally and elk with presumed TAHD represented <15% of the adult females that were monitored, McCorquodale et al. (2014) were not able to conclude whether or not TAHD was a contributing factor in observed declines.

The number of elk that have TAHD and the effects of TAHD on elk vital rates, collectively, will determine what the long-term implications of TAHD are for the viability, and subsequent management, of impacted elk herds (Wobeser 2007). Consequently, our primary research goals are to quantify how TAHD may affect the survival, pregnancy rates, productivity, and nutritional condition of adult female elk. Our specific study objectives include:

1. *Estimate the effects of TAHD on survival of adult (≥ 2 years old) female elk.*
2. *Determine cause-specific mortality rates for adult female elk that have TAHD.*
3. *Estimate the effects of TAHD on the pregnancy rates of adult female elk.*
4. *Estimate the effects of TAHD on elk productivity (i.e., survivorship of calves).*

5. *Estimate the effects of TAHD on the level of condition (i.e., IFBF) adult female elk are able to achieve in autumn.*

6. *Increase our understanding of how TAHD progresses in individual elk, and whether affected elk may recover from the disease.*

STUDY AREA

Our study area consists of 5 Game Management Units (GMUs) that, collectively, represent the core range of the MSH herd (Figure 1). The primary reasons we focused our work in this area are: 1) it occurs within the TAHD endemic area; 2) it decreases the probability of stochastic variation in the data independent of TAHD; and 3) it is the same study area of McCorquodale et al. (2014). Having the same study area as McCorquodale et al. (2014) afforded us the opportunity to put more emphasis on monitoring elk affected by TAHD because we could potentially use their findings for non-affected elk, 2009–2012, as baseline estimates of survival for elk independent of the disease.

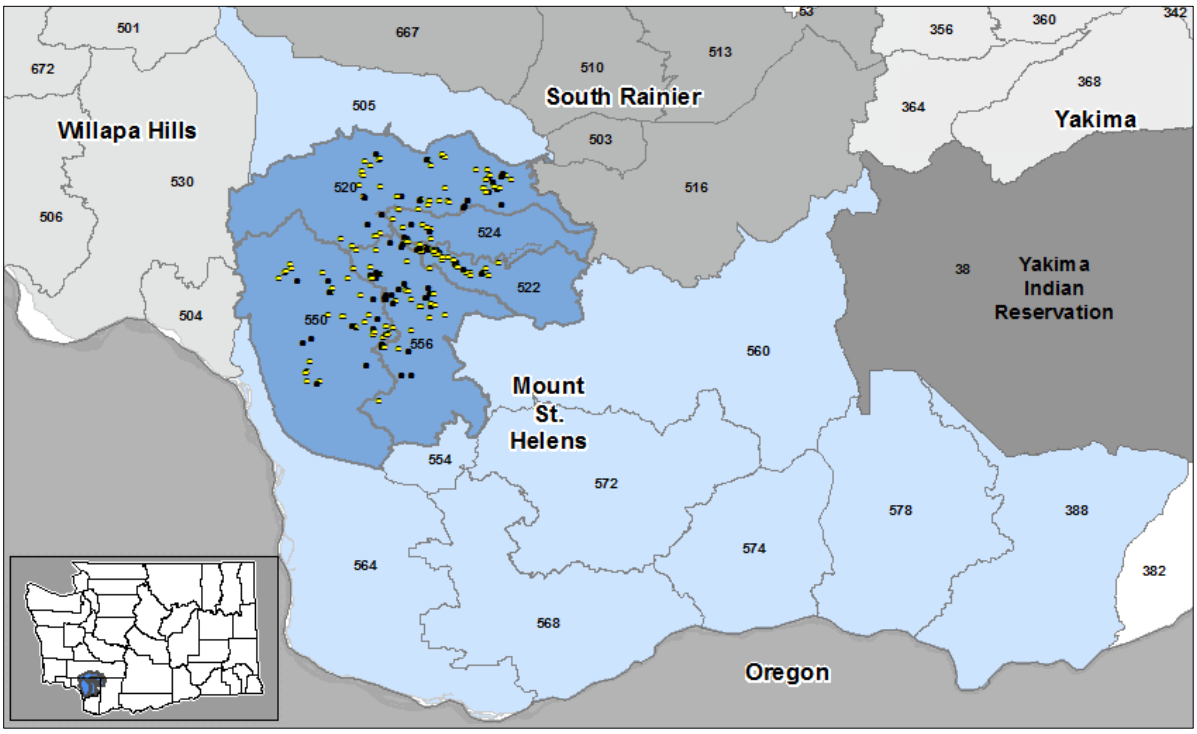

Figure 1. Map depicting the Game Management Units (GMUs) that comprise the Mount St. Helens elk herd area (light blue), the 5 GMUs that represent the core range of the herd and our study area (dark blue), and the locations where we have captured elk affected (yellow) or seemingly unaffected (black) by treponeme-associated hoof disease, February 2015–December 2017. Also included for spatial reference are GMUs associated with the Willapa Hills, South Rainier, and Yakima elk herds.

METHODS AND RESULTS

Capture and Marking

We initiated captures February 17–27, 2015 with the goal of capturing and marking 80 adult female elk at a ratio of 3 elk affected by TAHD (hereafter, diseased group) to every 1 elk that was unaffected (hereafter, control group). We conducted subsequent captures December 2015–2017, with the primary goal of maintaining our desired sample size and 3:1 ratio within each GMU. We conducted captures December 16–22 in all 3 years. When attempting to mark elk for inclusion in our diseased group, we only targeted individuals that were visibly limping, which, in most instances, was indicative of an elk having advanced stages of TAHD–of the elk we captured that were limping, only 3 were unaffected by TAHD. However, subsequent to us capturing them, we determined some elk we had captured for inclusion in our control group (i.e., not limping) had early stages of the disease. Although we were primarily interested in marking elk most severely affected by TAHD, we made the decision to include these elk in the diseased group because it afforded us the opportunity to increase our understanding of disease progression. Lastly, in order to increase the likelihood that our sample of diseased elk was an unbiased sample, we attempted to capture the first limping elk we detected within a group, regardless of their apparent condition (i.e., some elk were visibly emaciated at time of capture).

We captured female elk via aerial darting from a Bell 206B Jet Ranger helicopter using recommended immobilizing and reversal agents (Kreeger and Armeno, 2007). We blindfold elk to minimize stress during handling, administered clostridium vaccine (the first time the animal was captured), vitamin E and analgesic (flunixin meglumine) injections, and treated the dart wound. We marked each elk using a colored and numbered ear-tag and a mortality-sensitive, GPS (Global Positioning System)-equipped radio-collar. We determined disease status by having a veterinarian, knowledgeable of hoof deformities commonly associated with TAHD and other hoof diseases, examine each hoof after we had used a saline solution to remove mud and debris from the hoof. We also removed an upper canine tooth to determine age using microhistological analysis of cementum annuli (Hamlin et al. 2000; Matson's Laboratory, Milltown, MT).

We captured 80, 46, 43, and 42 female elk February 2015, December 2015, December 2016, and December 2017, respectively (Table 1). A subset of the elk we captured in December 2015 (n = 20 diseased, 10 control), December 2016 (n = 15 diseased, 8 control), and December 2017 (n = 6 diseased, 4 control) represented elk we had originally marked during previous capture events.

We recaptured these elk to accomplish three objectives: 1) to confirm disease status of elk in our control group; 2) to increase our understanding of disease progression; and 3) to index the proportion of elk known to be pregnant within each group that successfully raised a calf through late-autumn. Collectively, we captured 148 individuals during 211 capture events.

Table 1. The number of female elk we captured in each Game Management Unit (GMU) by capture event and the number of those elk that had visible signs of being affected by treponeme-associated hoof disease (Diseased Group), or appeared to be unaffected by the disease (Control Group).

	Diseased Group					**Control Group**				
GMU	**Feb 2015**	**Dec 2015**	**Dec 2016**	**Dec 2017**	**Total**	**Feb 2015**	**Dec 2015**	**Dec 2016**	**Dec 2017**	**Total**
520	24	10	10	3	47	6	5	4	2	17
522	11	6	5	9	31	1	2	3	5	11
524	1	4	2	0	7	3	0	0	1	4
550	15	6	4	5	30	5	0	2	5	12
556	9	5	9	6	29	5	8	4	6	23
Total	**60**	**31**	**30**	**23**	**144**	**20**	**15**	**13**	**19**	**67**

We did not mark two of the elk we captured in February 2015 because they died during the capture process (1 yearling and 1 adult; both had TAHD). In addition, we had 1 diseased elk we captured in December 2016 and 1 control elk in December 2017 that died within 1 day of being captured. In both instances, we immediately retrieved the radio-collar and redeployed it on a different elk. We included data from these elk in all analyses, except for survival.

Ages of female elk at time of initial capture that we assigned to our diseased group (n = 101) ranged 1-16 years and averaged 6 years old (95% CI = 5-7), while ages of female elk we assigned to our control group (n = 45) ranged 1-13 years and averaged 7 years old (95% CI = 6-8) (Figure 2). We were not able to collect a tooth for age determination from 2 elk in our diseased group.

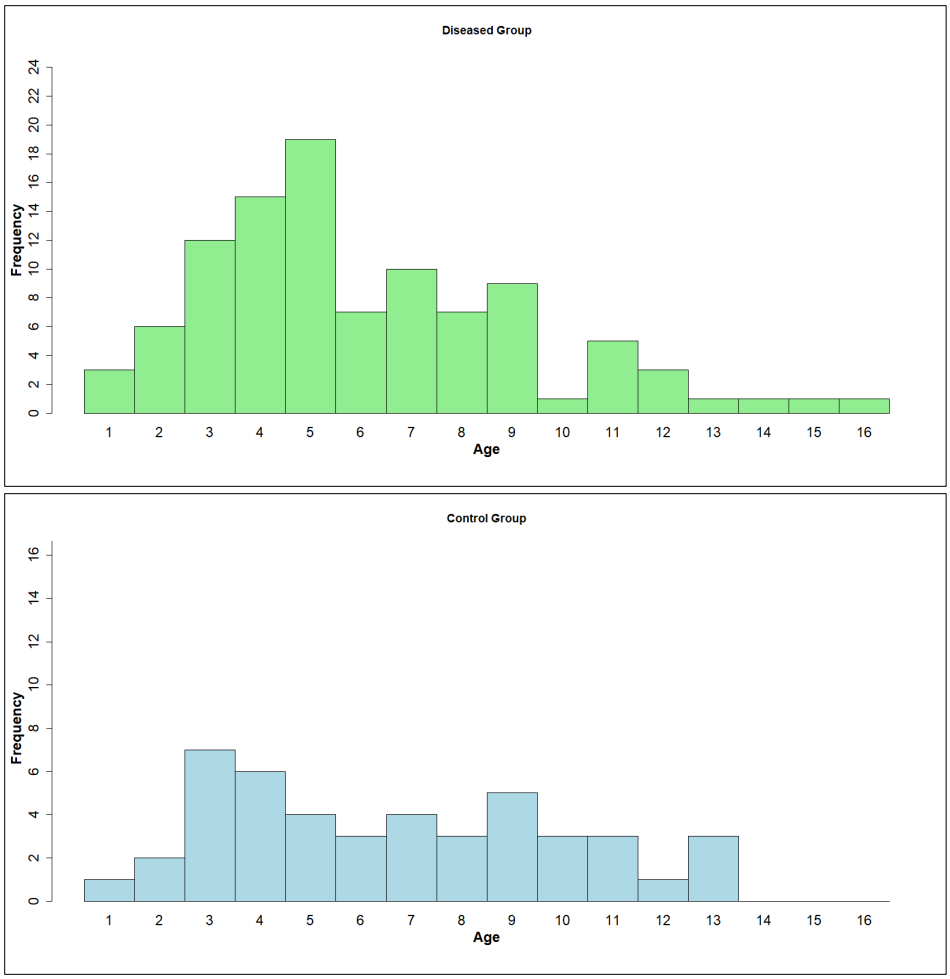

Figure 2. Distribution of ages at time of initial capture for female elk we captured, 2015–2017, that were affected by treponeme-associated hoof disease (Diseased Group) or had no visible signs of being affected by the disease (Control Group).

Disease Occurrence within Control Group

To date, we have marked and assigned 44 elk to our control group, of which, 14 are new study animals we captured for the first time in December 2017 (does not include the control elk that died during capture in December 2017). We have confirmed disease status for 25 of 30 elk we captured prior to December 2017, of which 0.48 (12/25) have contracted TAHD after we initially marked them. For elk within our control group that we captured during subsequent capture events, 0.25 (3/12), 0.22 (2/9), and 0.50 (3/6) in December 2015, 2016, and 2017, respectively, had contracted TAHD between capture events.

Disease Severity, Progression, and Recovery

We have continued to observe wide variation in hoof disease severity subsequent to our initial capture in February 2015. We initially developed grades of the disease that were related to a visual characterization of hoof deformities (Figure 3), but recognize our scoring system is subjective and may not exactly correlate with the effects of TAHD on the energy dynamics of elk. For example, we have preliminarily defined Grade IV of the disease to include any elk that is missing 1 or more hoof capsules, which would include an elk that recently sloughed its hoof capsule and is dealing with a painful, badly infected foot, and likely using a lot of energy fighting that infection. However, elk classified as having Grade IV may also include an animal that sloughed its hoof capsule several years prior and has, relatively speaking, healed and is no longer expending the same amount of energy it was when the hoof initially sloughed. Although we anticipate incorporating some measure of disease severity will strengthen the inferences we can make, our grading system is still evolving as we continue to increase our understanding of the disease during subsequent examinations of recaptured elk, from histology and microbiology examinations of hooves from study animals and hunter-harvested elk, and from evaluations of individual elk health status via clinical pathology of blood samples.

Severity.—We captured 103 elk that were affected by TAHD at the time of initial capture and we completed a full examination of all 4 hooves for 98 of them. The back hooves were involved in all 98 cases, only 1 back hoof was involved in 0.66 (65/98) of the cases, and both back hooves were involved in 0.26 (25/98) of the cases. It does not appear the rate at which TAHD involves the back right (57/98 = 0.58) or back left (66/98 = 0.67) hooves is disproportionate. The front hooves were involved in only 0.10 (10/98) of the elk we examined. The majority of elk within our diseased group either had TAHD on a single hoof with characteristics we have preliminarily associated with advanced stages of the disease (i.e., Grade 3 or Grade 4; 53/98 = 0.54) or had the disease on multiple hooves (33/98 = 0.34) (Figure 4).

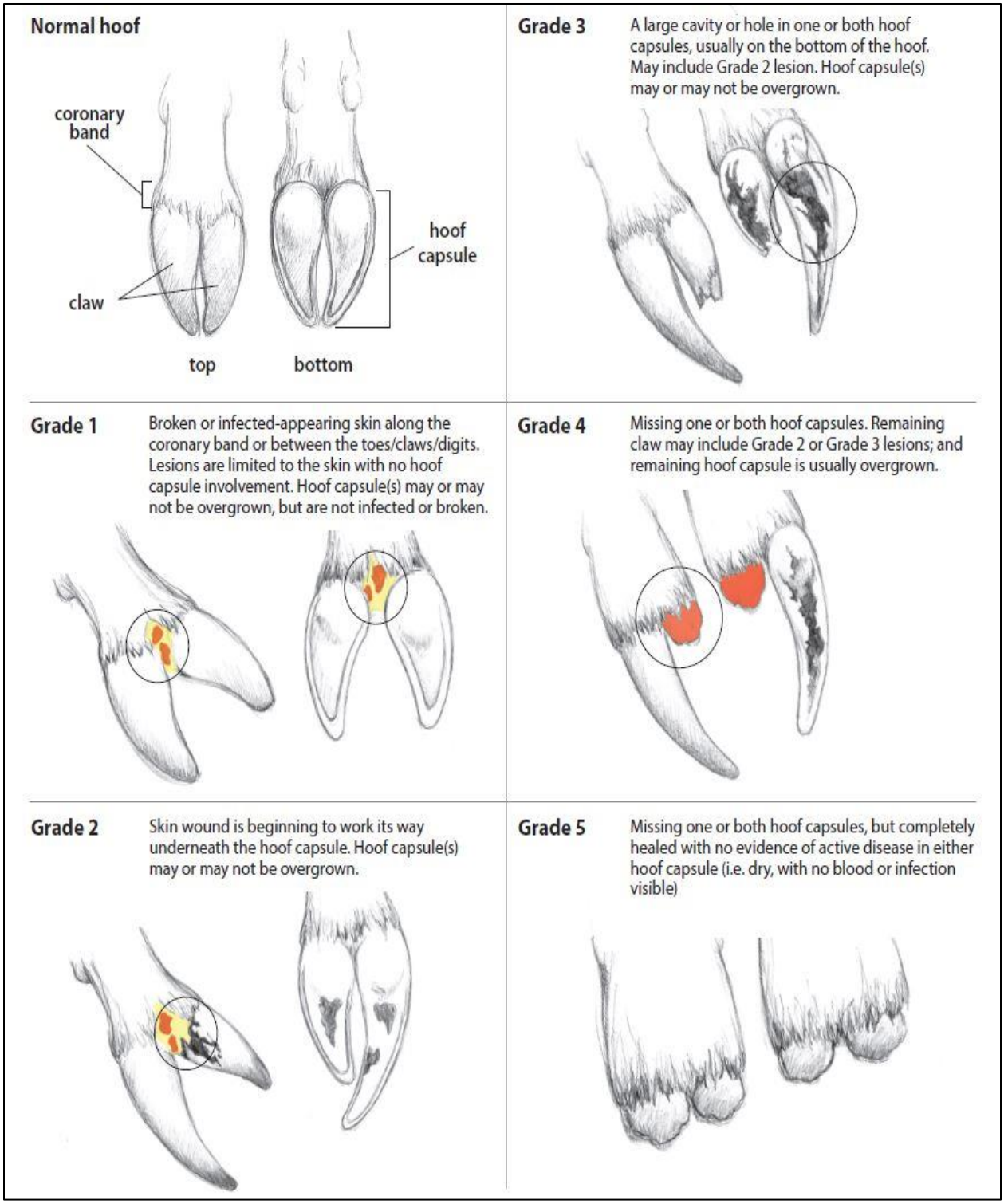

Figure 3. Diagram depicting characteristics we preliminarily associated with the 5 grades of treponeme-associated hoof disease we defined after capturing 60 female elk in February 2015, showing widely variable manifestation of the disease.

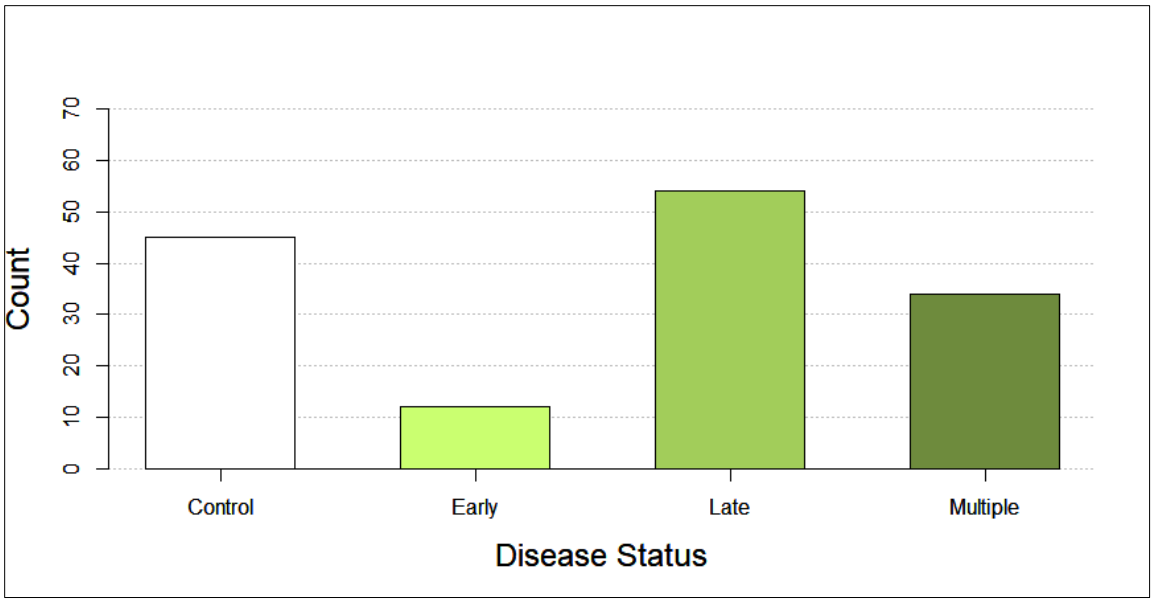

Figure 4. Distribution of hoof condition scores [Control, Early (Grade I or II), Late (Grade III or IV on a single hoof), and Multiple (present on multiple hooves)] at time of initial capture for female elk we captured February 2015–December 2017.

Progression.—We have recaptured 28 elk from our diseased group during subsequent capture events, which represented 36 hooves that were affected by TAHD during the previous capture. Of those 36 hooves, the disease progressed in 14, stayed the same in 16 (14 were Grade IV), had resolved in 6 (all were Grade I or Grade II), and 6 additional hooves had become involved. Five elk had progressed from having TAHD on a single hoof to multiple hooves, 13 had a single hoof involved during both captures, 4 transitioned from having multiple hooves involved to a single hoof, 4 had multiple hooves involved during both captures, and the disease had potentially resolved in 2 elk (Elk 161 and 162 both had Grade I on a single hoof the previous year; see below). In addition, 8 of the 27 elk from our control group had developed TAHD, with one of them having developed Grade IV on a single rear hoof between February 2015 and December 2015. Collectively, this information indicates that in many cases TAHD progresses quite rapidly and most individuals likely develop advanced stages of the disease within the first year of becoming infected.

Recovery.—We have only observed 1 case where an elk affected by TAHD had definitively recovered from the disease. We originally captured Elk 315 in December 2016, at which time we determined she had Grade II on her right hind hoof (Figure 5). She was subsequently legally harvested in November 2017 and formal examinations indicated all four hooves were grossly and

histologically normal, in addition to silver stains being negative for any spiral bacteria with typical *Treponema* morphology. We are not able to definitively claim the disease resolved in Elk 161 and Elk 162 because we only made that assessment during a gross examination of the hooves in a field setting.

Figure 5. Photos of the right hind hoof from Elk 315 at time of initial capture on December 16, 2016 (left image) and photos of both rear hooves at time of histological examination at the Colorado State University Veterinary Diagnostic Laboratory, Fort Collins, Colorado, USA in 2017. The elk was legally harvested on November 5, 2017.

Body Condition

We determined body condition [i.e., percent ingesta-free body fat (IFBF)] at time of capture by having an experienced observer use a portable ultrasound to measure maximum subcutaneous rump fat thickness (MAXFAT) and determine a rump body condition score (rBCS) following the procedures of Cook et al. (2001*a*). We then used estimates of MAXFAT and rBCS to estimate IFBF at time of capture following the procedures of Cook et al. (2010). We also measured each elk's chest girth to estimate body mass following the procedures of Cook et al. (2003). Lastly, because lactation status has consistently been shown to be a primary determinant of the level of condition female elk are able to achieve in autumn (Cook et al. 2004, Cook et al. 2013), we classified elk as lactating (milk could be extracted from the udder) or non-lactating (milk was not present). The presence of milk indicated the female had been nursing a calf sometime within the previous 11 days (Flook 1970). Our non-lactating group undoubtedly included a combination of females that were not bred the previous autumn (true non-lactators), females that lost their calf at or near parturition, females that lost their calf at various times between parturition and capture,

and females that successfully produced a calf, but ceased lactating prior to capture. We pooled data December 2015–2017 to increase sample sizes.

Mean estimates of IFBF were consistently lowest for elk that were affected by TAHD, albeit those differences were minimal and have a low probability of being statistically significant, except for non-lactating elk in December (Table 2 and Figure 6). However, our current estimates include all elk affected by TAHD, irrespective of disease severity, which as discussed we cannot confidently quantify at this time. For example, 12 (6 lactating, 6 non-lactating) of the elk in our diseased group that we captured in December represented elk that had early stages of the disease, and given that we have learned the disease progresses quickly, there is a reasonable likelihood these elk spent a majority of the summer-autumn period unaffected by TAHD. Although sample sizes are small, our preliminary observations indicate the condition of adult female elk with early stages of the disease may be more similar to the condition of adult female elk within our control group.

Table 2. Mean estimates and associated 95% confidence intervals (CI) of percent ingesta-free body fat (IFBF) by disease and lactation status for adult female elk we captured in February and December in the Mount St. Helens elk herd area, 2015–2017.

	Non-Lactating						**Lactating**					
	Diseased Group			**Control Group**			**Diseased Group**			**Control Group**		
Season	***n***	$\bar{x}$	**CI**	***n***	$\bar{x}$	**CI**	***n***	$\bar{x}$	**CI**	***n***	$\bar{x}$	**CI**
February	56	4.2	3.6-4.7	19	5.1	3.9-6.2	---	---	---	---	---	---
December	46	5.8	5.2-6.5	16	8.5	7.7-9.2	36	5.3	4.7-6.0	31	6.3	5.7-6.94

Pregnancy

We determined pregnancy status at time of capture via ultrasonography and analysis of Pregnancy–Specific Protein B (PSPB) in serum samples collected during capture (Noyes et al. 1997). None of the elk we classified as yearlings (n = 4) were pregnant. For adult female elk, pregnancy rates have consistently been higher for our control group (range = 0.69–0.84) than for our diseased group (range = 0.32–0.59) (Figure 7). Overall, 50% (95% CI = 41–58%) of elk within our diseased group (n = 139) and 79% (95% CI = 67–87%) of elk within our control group (n = 66) have been pregnant. For comparison, McCorquodale et al. (2014) reported an overall pregnancy rate of 67% for the 109 adult female elk they captured 2009–2012.

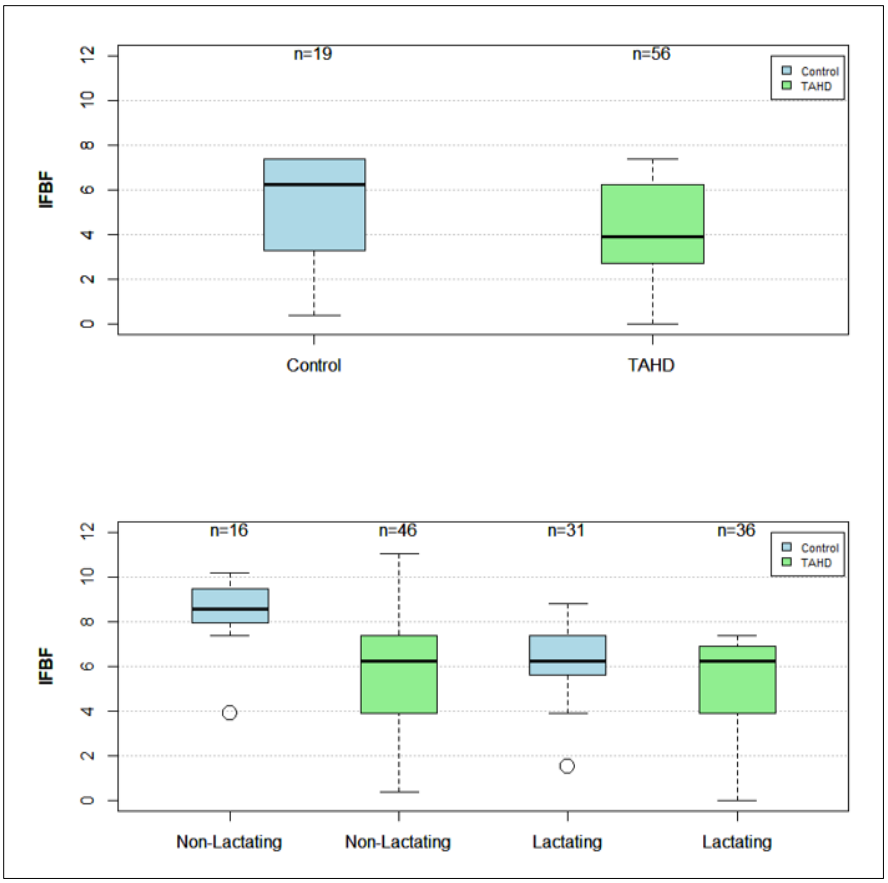

Figure 6. Boxplots of percent ingesta-free body fat (IFBF) by disease status for adult female elk we captured in the Mount St. Helens elk herd area February 2015 (top) and by disease and lactation status for adult female elk we captured December, 2015–2017 (bottom).

Productivity

In our original proposal, we defined productivity as the early survivorship of calves (e.g., to 6 months of age) and proposed we would estimate productivity using calf-at-heel ratios or lactation rates from hunter harvested elk. We have since abandoned those efforts and are only indexing calf survival using lactation rates observed in December and directly estimating calf survival from elk that we captured during subsequent capture events (i.e., we know what their pregnancy status was the previous year and assume a calf died if they were pregnant in $Year_t$, but not lactating in $Year_{t+1}$).

The proportion of adult female elk that were lactating at time of capture in December has ranged 0.63–0.69 for elk in our control group and 0.42–0.45 for elk within our diseased group (Figure 8). Overall, 0.66 (95% CI = 0.52–0.78) of elk within our control group (n = 47) and 0.44 (95% CI = 0.34–0.55) of elk within our diseased group (n = 82) have been lactating in December.

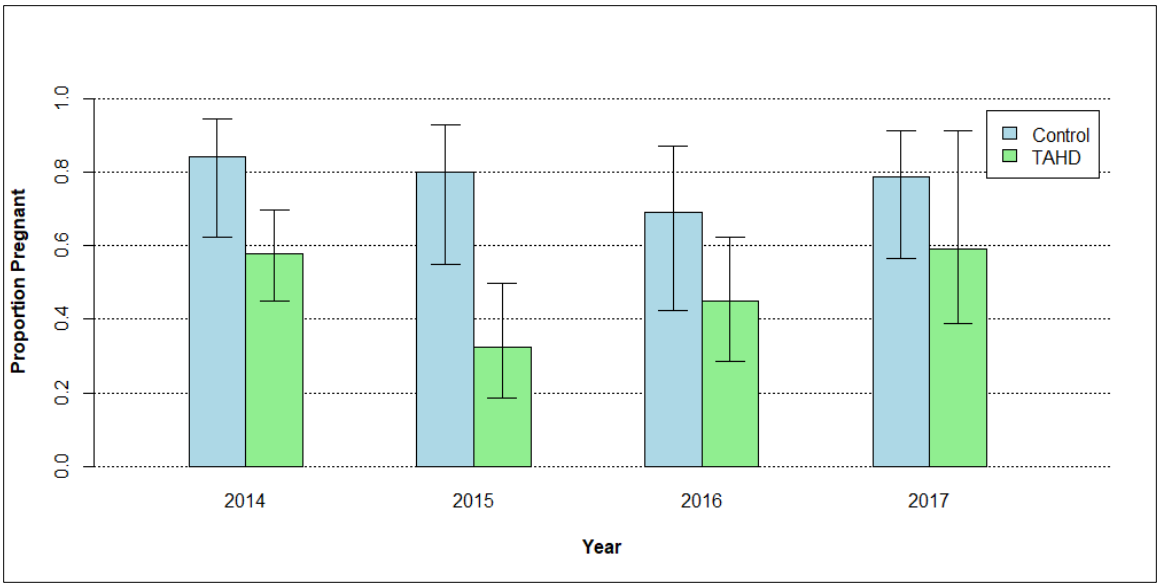

Figure 7. The proportion (and associated 95% confidence intervals) of adult female elk that were pregnant and affected by treponeme-associated hoof disease (TAHD) or had no visible signs of being affected by the disease (Control) at time of capture in the Mount St. Helens elk herd area, 2014–2017.

Although lactation rates were consistently lower for elk in our diseased group, they also had lower pregnancy rates, which indicates calf survival may not be substantially disparate between groups. Although inferences are limited by our small sample size, estimates of calf survival using pregnancy and lactation status of elk captured during subsequent capture events, also indicate calf survival to 6 months of age may be similar between groups. We estimated calf survival for our control group to be 0.60 (n = 10) in 2015, 0.75 (n = 8) in 2016, and 0.50 (n = 6) in 2017. Estimates of calf survival for our diseased group were 0.62 (n = 13) in 2015, 0.50 (n = 6) in 2016, and 0.67 (n = 3) in 2017. Overall, 0.63 of adult female elk within our control group where pregnancy status was known and 0.60 within our diseased group have successfully raised a calf through late-autumn.

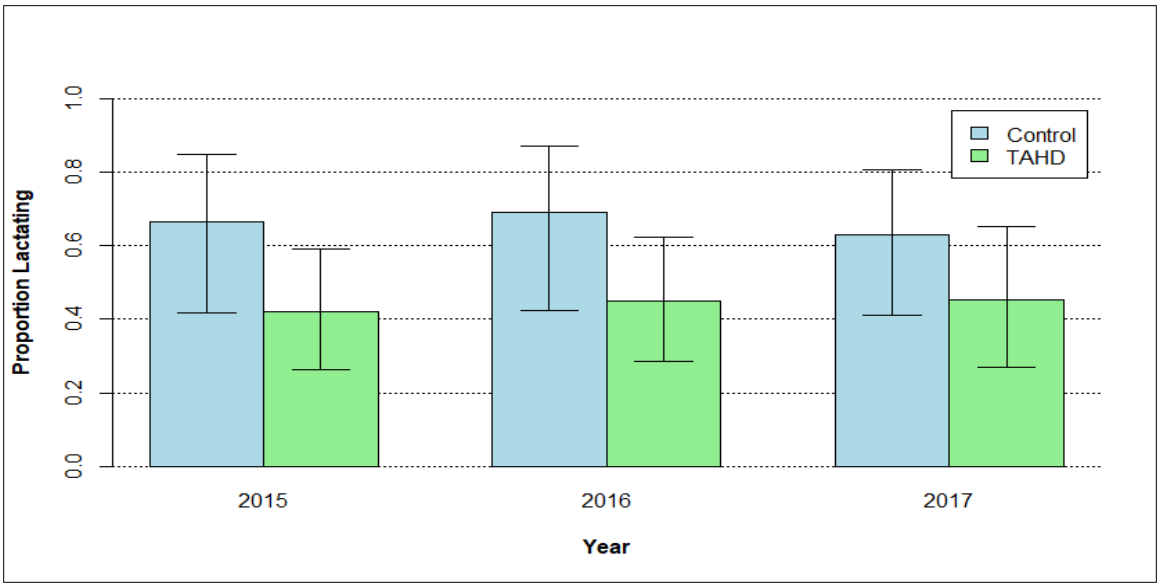

Figure 8. The proportion (and associated 95% confidence intervals) of adult female elk that were lactating in December and affected by treponeme-associated hoof disease (TAHD) or had no visible signs of being affected (Control), in the Mount St. Helens elk herd area, 2015–2017.

Survival

For our preliminary analysis, we estimated survival using the Kaplan-Meier estimator, modified for staggered-entry of individuals (Pollock et al. 1989). In addition to estimating survival since project initiation (i.e., March 2015–August 2018), we also estimated annual survival rates (i.e., May $1_{\text{Year t}}$–April $30_{\text{Year t+1}}$) and survival rates during 3 seasons that were biologically relevant to elk. These seasons included: 1) summer (May–August), the period of greatest nutritional demand for female elk supporting calves, 2) autumn (September–December), when the nutritional demands associated with lactation diminish and hunting seasons occur, and 3) winter (January–April), when elk primarily rely on fat reserves they accrued the previous summer-autumn period to meet their basic metabolic requirements.

In addition to censoring elk that died during or immediately following the capture process, we censored two mortalities from our survival analyses because, in both instances, the elk died within a couple weeks of their capture and we could not rule out capture-related stress as a contributing factor (e.g., Beringer et al. 1996). We also censored 1 elk from all analyses because she was originally captured in February 2015 as a control, missed in December 2015, and then her radio-collar quit transmitting in November 2016—thus, we have no way of knowing whether or not she had maintained her control status. In addition, we have had 5 radio-collars fail and subsequently

censored these elk from our analyses at the last point in time we received a GPS location transmission or determined the elk's status via VHF monitoring. Lastly, any elk within our control group that developed TAHD and had advanced stages of the disease was censored during the time period when disease status was unknown. For example, we censored the 3 elk confirmed to have lost their control status between February 2015 and December 2015 from our analysis during the period of February 2015–November 2015 and then brought them back into the analysis as a diseased elk in December 2015. We took this approach because we have no way of knowing when exactly they developed the disease. Lastly, we have had 2 control elk die within a few months of us capturing them (February and May, both captured the previous December) that had developed early stages of the disease by the time they died. In both instances, we kept them in the control group for this preliminary analysis. We believed this decision was justified given that disease progression appears to be quite rapid (i.e., they likely contracted the disease shortly before death) and they had spent the majority of the year as an elk unaffected by TAHD, which may have influenced their probability of survival during winter months. This decision will be considered more thoroughly as the project progresses.

Estimated survival since project initiation (i.e., March 2015–August 2018) has been 0.23 (95% CI = 0.16–0.29) for our diseased group and 0.37 (95% CI = 0.24–0.51) for our control group. Annual survival rates were similar between groups in 2017, but greater for elk in our control group in 2015 and 2016 (Table 3). Survival during summer has been similar between groups and among years within groups (Table 3). Substantial differences in estimates of survival between groups have primarily occurred during the winter season and survival of elk in both groups was lowest in winter 2016 when abnormally severe winter conditions persisted (Table 3). Although survival during autumn has not been markedly dissimilar between groups, and lower for elk in our control group 2 of 3 years, all 6 mortalities we have documented for elk in our control group during autumn have been human-caused (i.e., natural survival has been 1.00), compared to only 5 of 15 mortalities in our diseased group.

Table 3. Estimated survival rates (Ŝ) and associated 95% confidence intervals (CI) for elk affected by treponeme-associated hoof disease (Diseased Group) and for elk that were seemingly unaffected by the disease (Control Group) during 3 seasons of biological relevance to elk in the Mount St. Helens elk herd area, 2015–2017.

Diseased Group								
	Summer		**Autumn**		**Winter**		**Annual**	
Year	**Ŝ**	**CI**	**Ŝ**	**CI**	**Ŝ**	**CI**	**Ŝ**	**CI**
2015	0.93	0.86-0.99	0.92	0.85-0.99	0.80	0.70-0.90	0.68	0.57–0.79
2016	0.94	0.87-0.99	0.91	0.84-0.99	0.68	0.56-0.79	0.58	0.47–0.69
2017	1.00	–	0.86	0.76-0.96	0.75	0.65-0.86	0.65	0.54–0.76
Control Group								
	Summer		**Autumn**		**Winter**		**Annual**	
Year	**Ŝ**	**CI**	**Ŝ**	**CI**	**Ŝ**	**CI**	**Ŝ**	**CI**
2015	0.93	0.81-0.99	0.85	0.65-0.99	1.00	–	0.79	0.61–0.97
2016	0.94	0.81-0.99	1.00	–	0.83	0.66-0.99	0.78	0.60–0.97
2017	1.00	–	0.67	0.43-0.91	1.00	–	0.67	0.51–0.84

[1]Summer = May–August; Autumn = September–December; and Winter = January–April

Cause-specific Mortality

We have documented 86 mortalities (73 diseased group, 13 control group) since project initiation and attempted to investigate all deaths within 24 hours of receiving a message that a mortality event had occurred. In instances where the carcass was fully, or mostly, intact, we performed a field necropsy to determine proximate cause of death and to collect tissue samples that we submitted to the Colorado State University Veterinary Diagnostic Laboratory (CSU) for histological examination. Samples we collected and submitted to CSU included tissue samples from the heart, lungs, liver, kidney, spleen, pancreas, mammary gland, brain, popliteal and pre-scapular lymph nodes, any other tissues that seemed abnormal in appearance, and all 4 hooves. We also collected a femur and measured bone marrow fat content to estimate percent body fat at time of death (Neiland 1970). We were not able to collect all samples from every mortality event. We have received final histology reports from CSU for all but 3 mortalities to date, but have not completed bone marrow analysis for 8 elk that died April 2018–present.

To date, we have classified proximate causes of mortality as malnutrition (only applies to our control group), general debilitation (only applies to our diseased group), disease (non-TAHD),

human-caused (legal and illegal harvest), unknown, accident, and predation. Mortalities we classified as general debilitation were typically characterized by severe emaciation, the presence of advanced hoof disease, and no evidence of another primary disease based on histology of all major organs sampled. The emaciation observed in these animals indicates that they are in an extreme negative energy balance. However, we have no way of determining the relative contribution of the catabolic effects of a chronic severe disease such as TAHD (Demling 2009), compared to the catabolic effects resulting from nutritional limitations, such as those already known to occur in this herd (Cook et al. 2013, McCorquodale 2014), and how they may interact to affect the survival of elk. Mortalities we classified as disease (non-TAHD) have included cases where histological findings indicated the elk was afflicted by a severe case of pneumonia, severe renal disease, or septicemia. Lastly, mortalities we have classified as accidents have included 4 elk that have gotten stuck in bogs/mud, 1 elk that apparently drowned, and 1 elk that fell down an extremely steep and rocky slope—in all 6 cases the elk were in extremely poor condition, which we believe contributed to their plight.

Of the 13 mortalities we have documented for our control group, we have preliminarily classified 1 as unknown. Of the remaining 12, we have classified 6 (0.50) as human-caused (3 legal, 2 wounding loss, 1 illegal), which has been the leading cause of mortality (Figures 9 and 10). Of the 73 mortalities we have documented for our diseased group, we censored 3, 2 are pending histological findings, and have preliminarily classified 14 as unknown. Of the remaining 54, the leading causes of mortality have been general debilitation (0.44, n = 24) and predation (0.28, n =15). Most mortality events for our diseased group have occurred January–April (Figure 10). In instances where we have classified mortalities in our diseased group as general debilitation, predation, and unknown, 1.00, 0.83, and 0.89, respectively, have had bone marrow content levels indicative of severe negative energy balance.

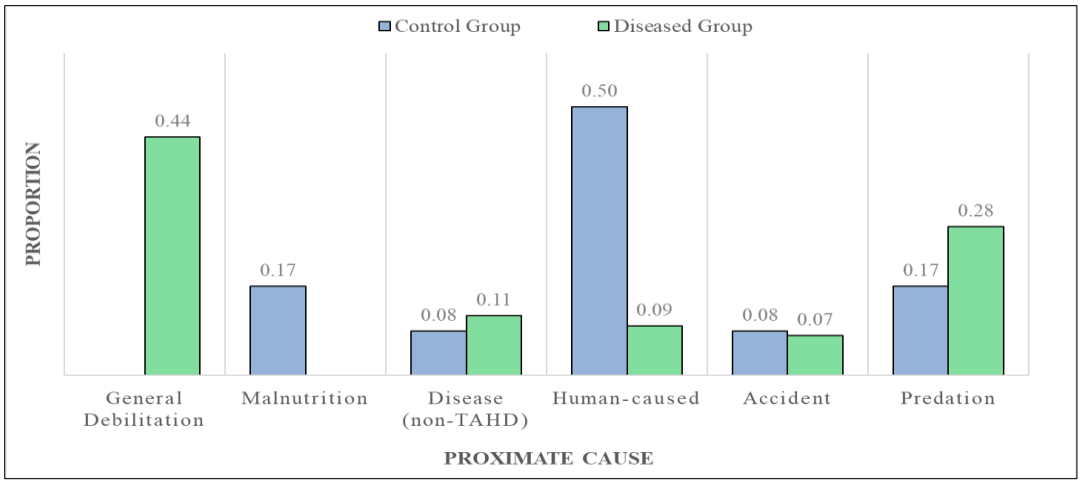

Figure 9. Proportion of deaths by proximate cause for adult female elk that were affected by treponeme-associated hoof disease (Diseased Group) or had no visible signs of being affected by TAHD (Control Group) in the Mount St. Helens elk herd area, February 2015–August 2018.

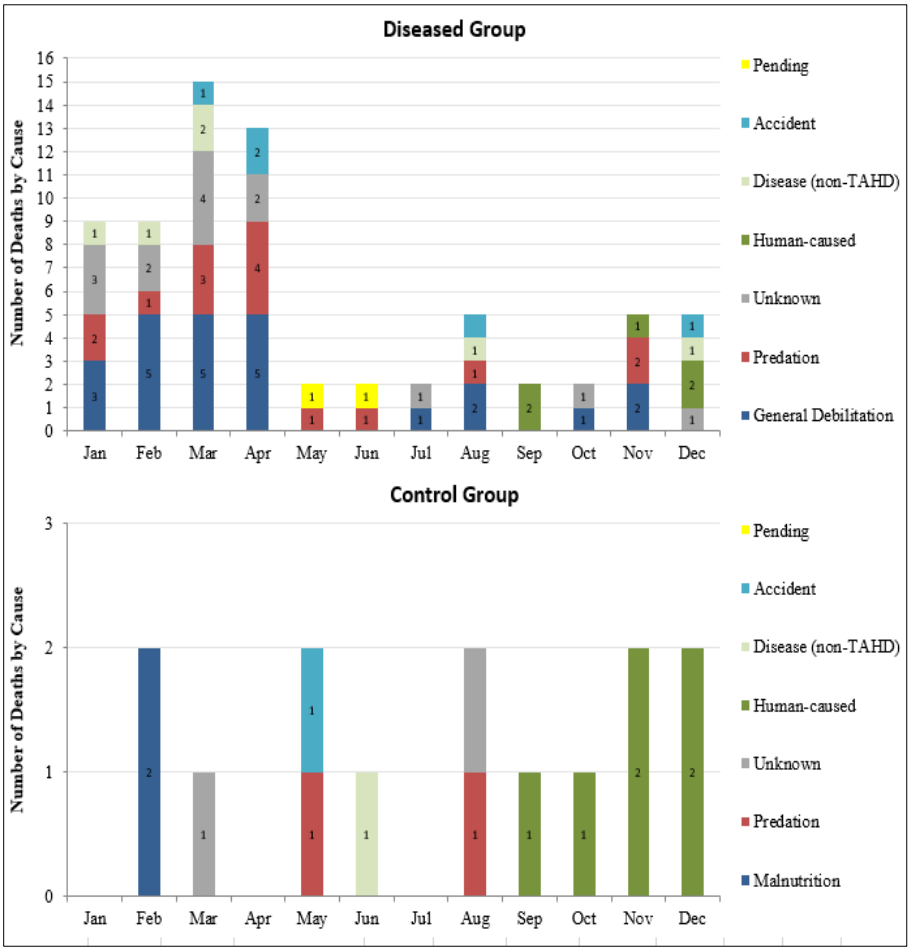

Figure 10. Number of deaths by cause and month for elk that were affected by treponeme-associated hoof disease (Diseased Group) or had no visible signs of being affected by the disease (Control Group) in the Mount St. Helens elk herd area, February 2015–August 2018.

DISCUSSION

It is far too soon for us to make any definitive statements that relate to our research objectives or to discuss our results in any detail. Preliminarily, elk affected by TAHD have had lower levels of condition in December, lower pregnancy rates, lower lactation rates, and lower annual survival rates. Our estimates of IFBF in December indicate elk in the Mount St. Helens elk herd area continue to experience strong nutritional limitations during late-summer and autumn, regardless of disease status. Irrespective of proximate cause, 0.88 of the mortalities we have documented for elk affected by TAHD, have included animals that had bone marrow content levels indicative of a severe negative energy balance. However, at this time we are not able to quantify the degree to which the catabolic effects of TAHD are contributing to those observations.

Our preliminary observations indicate that it will be important for us to consider disease severity when we complete our final analysis and we will continue to evaluate how we define disease status and severity as the study progresses. Similarly, we will continue to examine when we censor elk in our survival analysis that transition from our control group to our diseased group. At this point in time, we do not anticipate any changes to our study design and plan to conduct captures in December 2018.

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Tracking Number: (_2020-010_)

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, (physical address) 1416 Ninth Street, Suite 1320, Sacramento, CA 95814, (mailing address) P.O. Box 944209, Sacramento, CA 94244-2090 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: Shaun Reid.
Address: [redacted]
Telephone number: [redacted]
Email address: [redacted]

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: sections 200, 205, 265, 270, 275, 315, 316.5, 399, and 2084 of the Fish and Game Code

3. Overview (Required) - Summarize the proposed changes to regulations: Change the limit of wild rainbow and brown trout on the North Fork of the Stanislaus River and Beaver Creek to zero.

4. Rationale (Required) - Describe the problem and the reason for the proposed change: These waters are heavily pressured, but over the past couple of years, I have been catching more wild fish, both browns and rainbows. I'm really quite amazed at the fish I'm catching, particularly this season. This tells me that these waters have the ability to support wild fish populations, which makes for a great angling experience..

SECTION II: Optional Information

5. Date of Petition: July 28, 2020

6. Category of Proposed Change
x 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: for the 2021 season.

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: So long as fish continue to be planted, I see no reason that this would impact local businesses. In fact, should the fishery improve with bigger, wild fish, I suspect it could be a boost for the area.

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

Date petitioner was notified of receipt of petition and pending action: _____
Tracking Number

Meeting date for FGC consideration: _____

FGC action:

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

5. WILDLIFE DISEASES

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

(A) Discuss the status of multiple emerging wildlife diseases, including treponema-associated hoof disease (TAHD; also known as elk hoof disease), rabbit hemorrhagic fever, *Lactococcus garvieae*, and adenovirus hemorrhagic disease.

(B) Discuss and potentially approve recommendations for petition #2020-008, elk hunting suspension.

Summary of Previous/Future Action

(A)

- N/A

(B)

• FGC received petition #2020-008	Jun 24-25, 2020; WRC, Webinar/Teleconference
• Petition referred to WRC	Aug 19-20, 2020; Webinar/Teleconference
• **Today consider recommendation on petition**	**Sep 17, 2020; WRC, Webinar/Teleconference**

Background

(A) Within the past year, several new diseases affecting various fish and wildlife species have been detected in California. WRC will receive an update on four diseases: TAHD, rabbit hemorrhagic fever, *Lactococcus garvieae*, and adenovirus hemorrhagic disease.

(B) Petition #2020-008 (Exhibit B1) requests an emergency regulation to suspend elk hunting in the Northwestern California Roosevelt Elk Hunt Area, "[u]ntil the Department and Commission have the opportunity to consider the ramifications of the disease (including the cumulative effects of the disease together with approved hunting), ways to minimize the spread of the disease and measures to mitigate the harm to infected individuals and herds." The proposal advanced by the petition would allow hunting under a depredation permit. DFW will present information on the status of north coast elk herds and how disease is factored into models used to determine harvest numbers (see exhibits B2-B3).

Significant Public Comments

The Friends of Del Norte supports petition #2020-008 and asserts that DFW has not considered the cumulative impacts of TAHD. Along with a spreadsheet of data, the organization provides some analysis of herds, examines the elk management plan, and discusses cumulative impacts. Likewise, a commenter provides information on elk herds and urges DFW to produce a comprehensive TAHD treatment plan (see exhibits A1-A2 for Agenda Item 4, this meeting).

Recommendation

(A) ***FGC staff:*** None

(B) ***FGC staff:*** Recommend to FGC that petition #2020-008 be denied based on the rationale presented by DFW.

Exhibits

A1. DFW presentation, TAHD in California

A2. DFW presentation, *Rabbit hemorrhagic disease in California*

A3. DFW presentation, *Lactococcus Garvieae In California Fish Hatcheries*

B1. Petition #2020-008, received Jun 10, 2020

B2. DFW presentation, *North Coast Elk Management Unit Status*

B3. DFW presentation, *Review of Elk Population Models in 2019 Supplemental Environmental Document (SED)*

Committee Direction/Recommendation

(B) The Wildlife Resources Committee recommends that the Commission deny petition #2020-008.

OR

The Wildlife Resources Committee recommends that, with respect to petition #2020-008, the Commission _____.

North Coast EMU Status


http://www.grafphoto.com/wordpress/2011/08/02/roosevelt-elk-on-gold-bluffs-beach/

FGC Wildlife Resources Committee Meeting

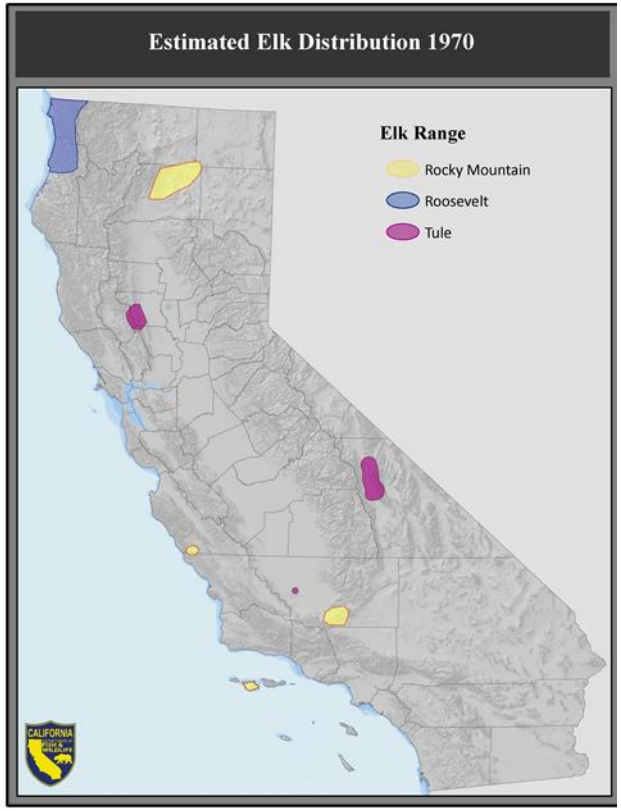
September 17, 2020

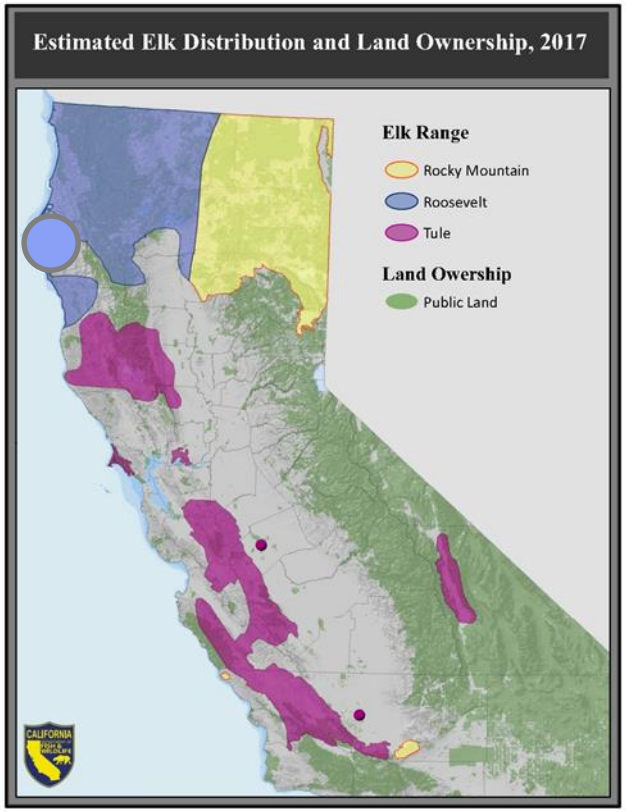
Carrington Hilson, MS
Region 1 – Wildlife

Presentation Overview

- Update on the current status of elk herds in the North Coast Elk Management Unit, specifically:
  - Minimum count data
  - Calf survival and recruitment
  - Adult survival
  - Population growth
  - EMU management goals

North Coast EMU



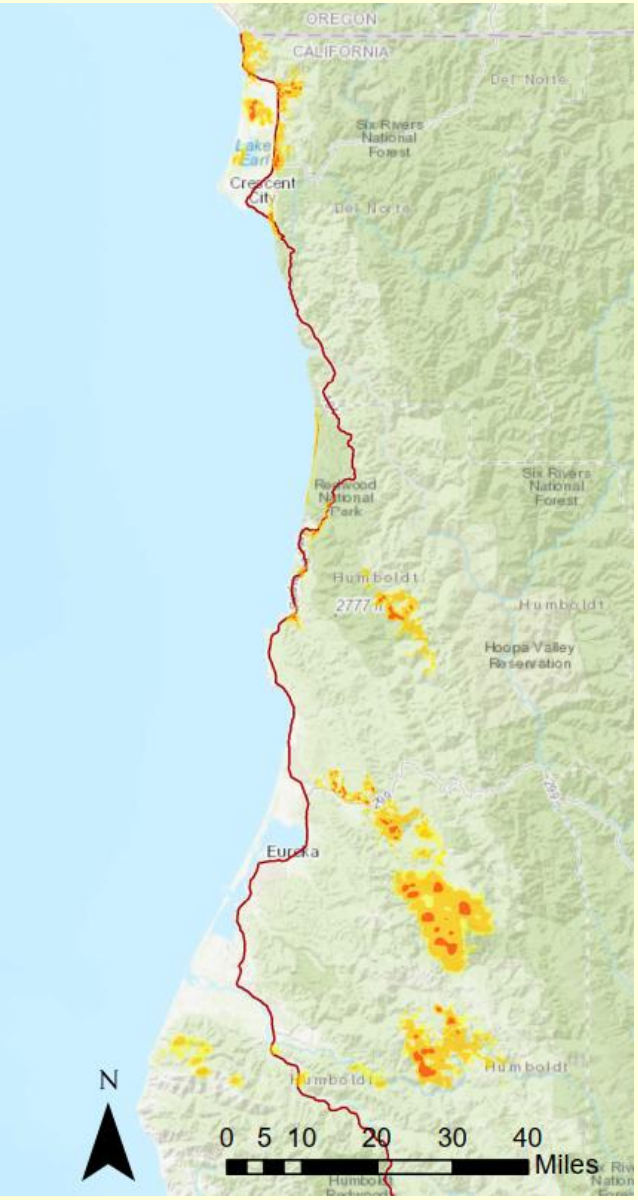


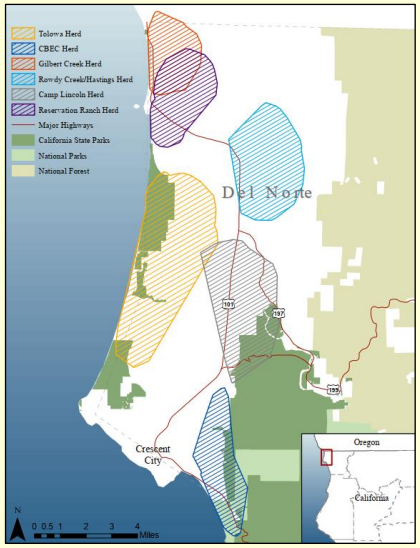
Minimum Count Data

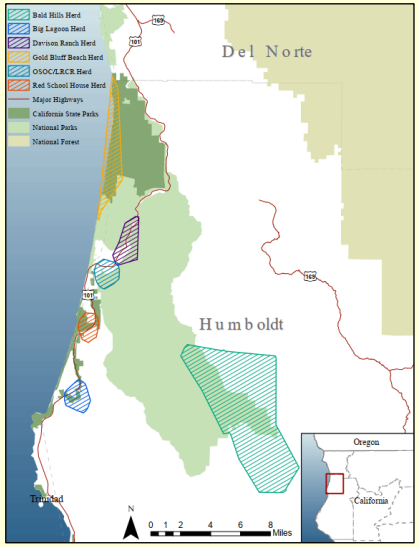


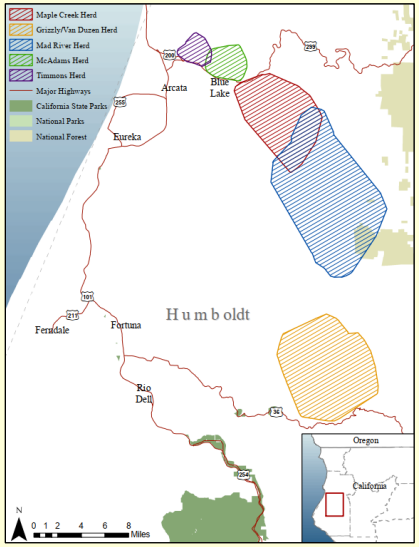

- Road surveys and opportunistic observations
  - Started in 2016
  - 14 routes established on public roads
  - > 350 road surveys completed

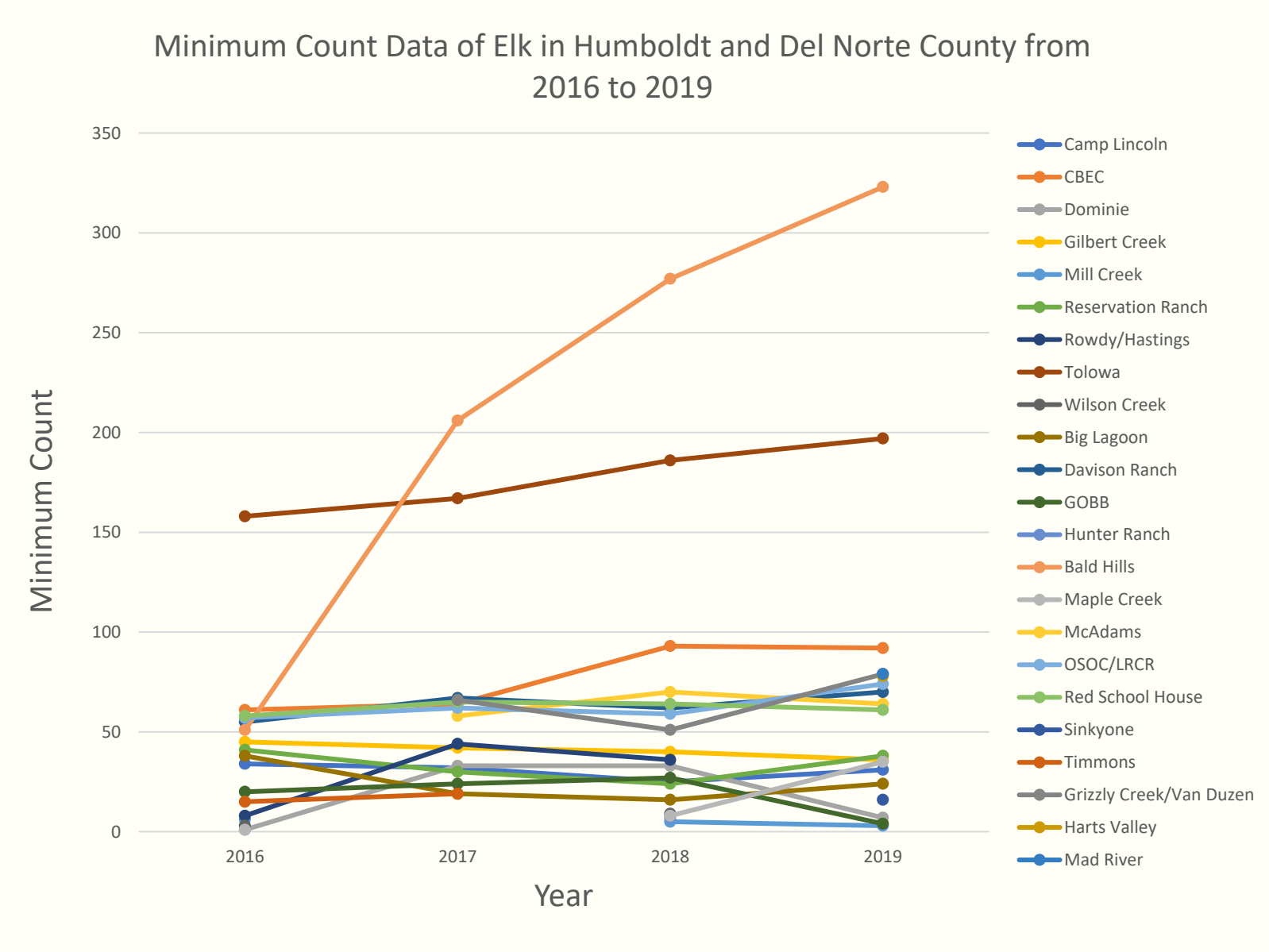
Minimum Count Data



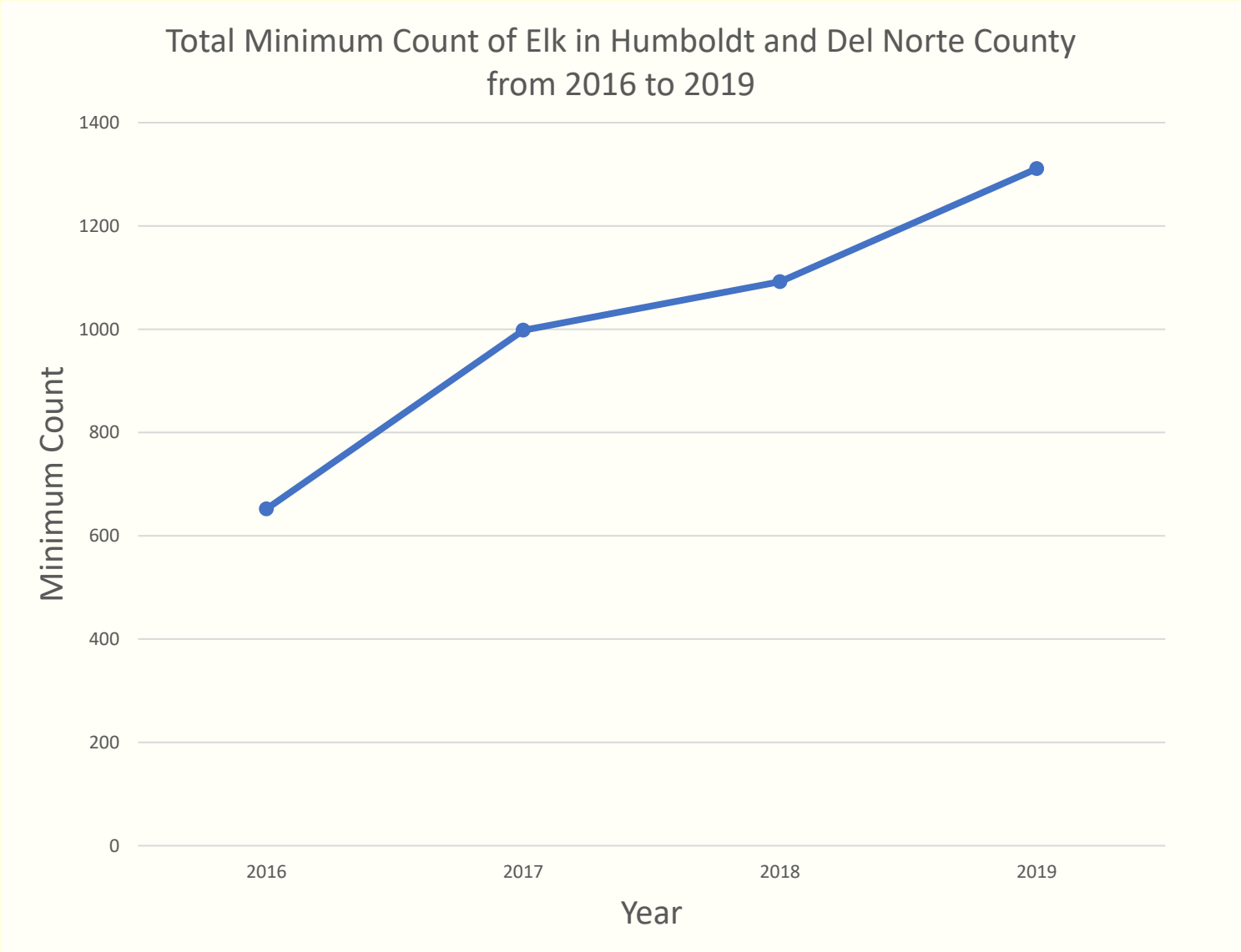








** Minimum count data obtained from California Department of Fish and Wildlife, Humboldt State University, Tolowa Dee-Ni' Nation, and Redwood National and State Park.*



** Minimum count data obtained from California Department of Fish and Wildlife, Humboldt State University, Tolowa Dee-Ni' Nation, and Redwood National and State Park.*

Estimating Abundance



Smith River

- No minimum count data
- n-Mixture model = 70-80

Central Humboldt

- Minimum count data = 114
- Fecal DNA mark-recapture = 500-600

Calf Survival and Recruitment

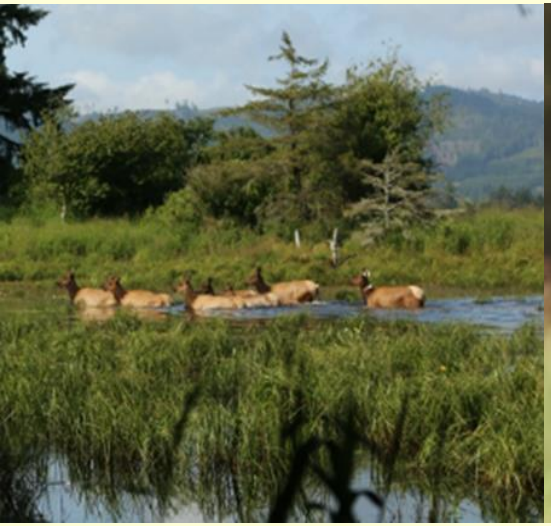
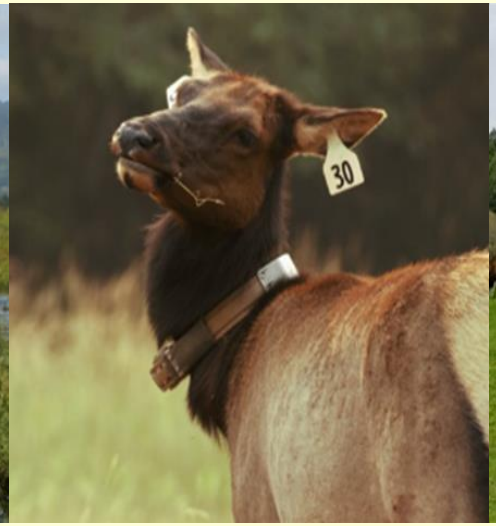
<u>Annual Survival</u>

- Humboldt (0.66, SE = 0.008)
- Del Norte (0.96, SE = 0.003)
- Overall (0.82, SE = 0.003)

Studies in other locations indicate annual survival ranging 0.07 to 0.58

High calf survival

Adult Survival

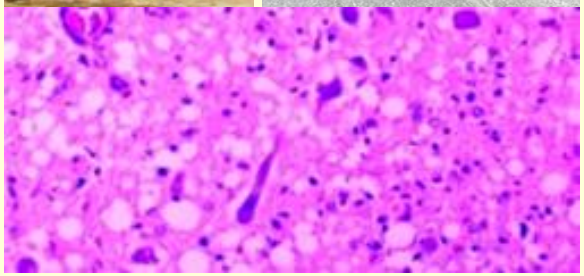



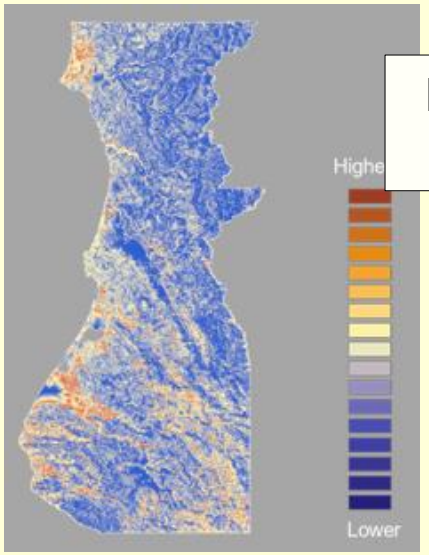

- Twenty-eight adult females were marked and monitored for 2 years. Model averaging of known-fate analysis resulted in an annual adult female survival of 0.92 (SE = 0.03, n = 24)

Population Growth

How do we get more elk?

-





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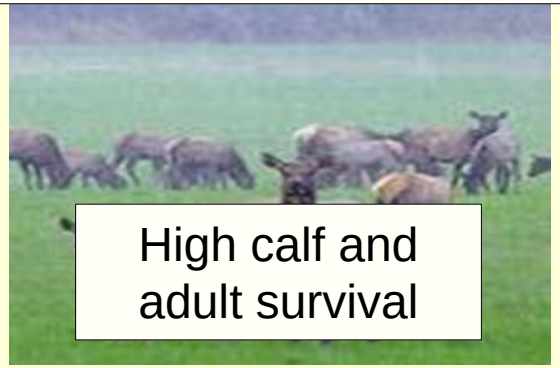
Potential abundance estimate of 13,000 -14,000 elk



High calf and adult survival

North Coast EMU Goals

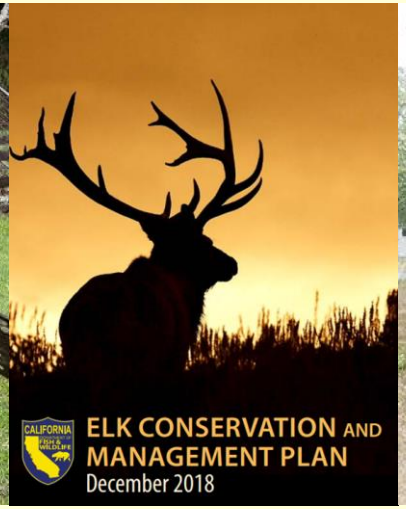
Maintain a population of 1,300 to 4,000 elk with a minimum of 15 bulls to 100 cows

Increase populations where conflict is expected to be minimal

Enhance or increase elk habitat

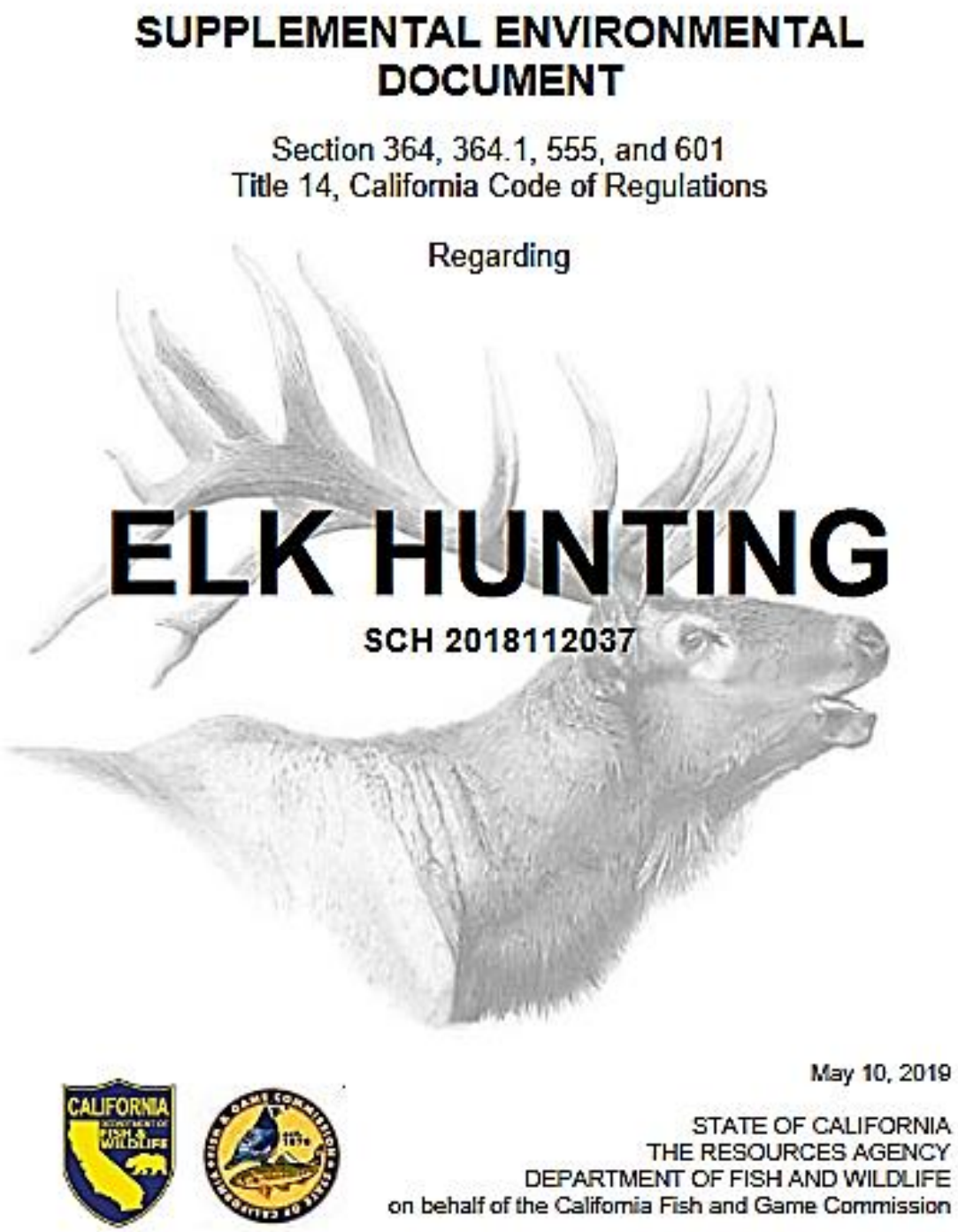
Stakeholder Meetings

North Coast
Roosevelt Elk Management Unit
(This EMU is considered a placeholder and starting point to initiate work with a local stakeholder group to help develop a refined plan for the unit)



Questions ◈ Thank You

Carrington Hilson
Environmental Scientist



Review of Elk Population Models in 2019 SED

Kristin Denryter, Ph.D.
Coordinator, Elk and Pronghorn Program
Wildlife Branch
California Department of Fish and Wildlife

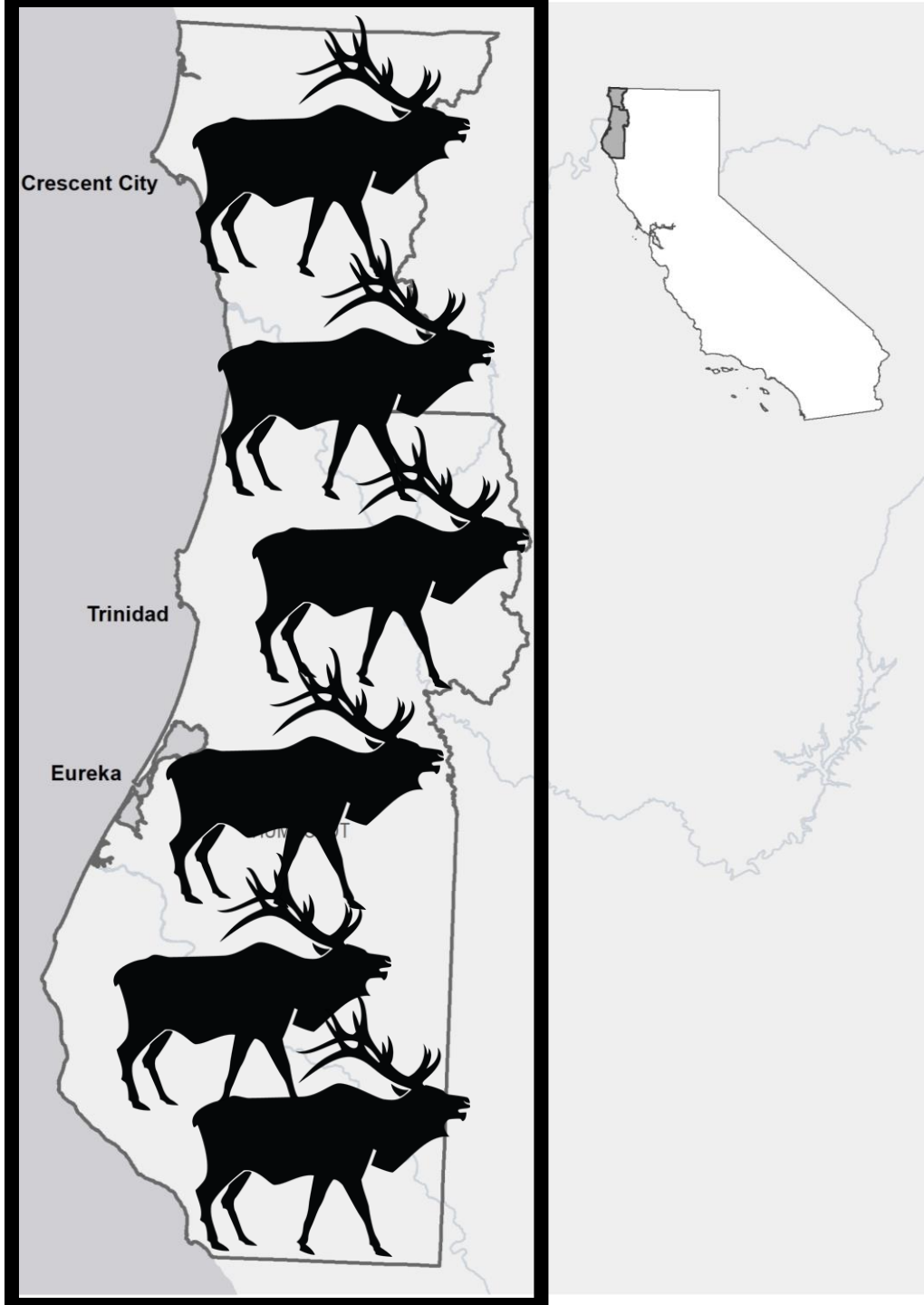
September 17, 2020
Wildlife Resources Committee

2019 SED Elk Hunting in NW Hunt Zone

Table 1. Impact Summary

Alternative	Description
Proposed Project	Increase the tag quota range for the Northwestern Elk Zone by 20 tags
Alternative 1. No Project	No change from the 2018-19 hunting regulations
Alternative 2. Increase Tag Quota (3 x proposed project)	Increase the tag quota range for the Northwestern Elk Zone by up to 60 tags
Alternative 3. Reduced Proposal (half of Proposed Project)	Increase the tag quota range for the Northwestern Elk Zone by 10 tags

Cumulative impacts pg. 26-33: drought, wildfire, habitat loss and degradation illegal harvest, depredation, vehicle-caused mortality, and **disease.**

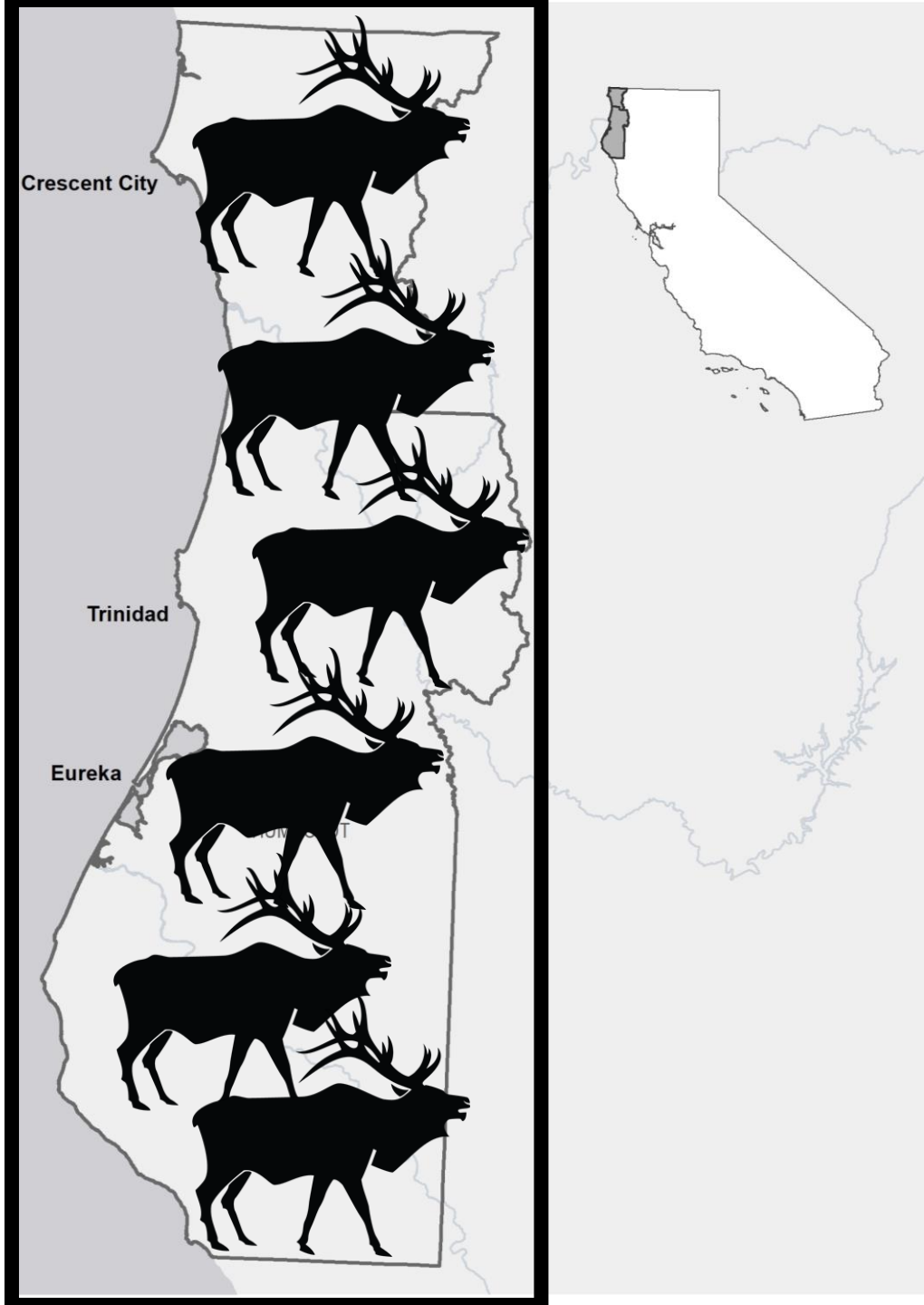


2019 SED Elk Hunting in NW Hunt Zone

Table 1. Impact Summary

Alternative	Description	Significant Impact
Proposed Project	Increase the tag quota range for the Northwestern Elk Zone by 20 tags	No
Alternative 1. No Project	No change from the 2018-19 hunting regulations	No
Alternative 2. Increase Tag Quota (3 x proposed project)	Increase the tag quota range for the Northwestern Elk Zone by up to 60 tags	No
Alternative 3. Reduced Proposal (half of Proposed Project)	Increase the tag quota range for the Northwestern Elk Zone by 10 tags	No

Cumulative impacts pg. 26-33: drought, wildfire, habitat loss and degradation illegal harvest, depredation, vehicle-caused mortality, and **disease.**



ElkPop model

```
NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019
(Combined Harvest for Del Norte and Humboldt cos)
                Ratio = 37/100/32 - Maximum Calf Survival = 40%
 K = 1,600          THIS PROGRAM CALCULATES CHANGES IN HERD
       OR           CHARACTERISTICS BASED ON VARIOUS HARVEST
    1,760           RATES.

INCREASED PROPOSAL: ADD 24 BULL AND 36 ANTLERLESS (SHARE) TAGS TO
                              68 BULLS AND 57 ANTLERLESS
HARVEST APPROXIMATELY         ELK
```

HERD SIZE	1600	ELK
% BULLS LOST TO NON HUNTING CAUSES	23.5	%
% COWS LOST TO NON HUNTING CAUSES	11.9	%
% OF BULLS KILLED BY HUNTERS	19.55	%
% OF COWS KILLED BY HUNTERS	6	%

Calf survival

```
NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019
(Combined Harvest for Del Norte and Humboldt cos)
                Ratio = 37/100/32 - Maximum Calf Survival = 40%
```

Documented calf survival: >40%

(Nigon 2020)

Adult mortality – hunting

```
INCREASED PROPOSAL: ADD 24 BULL AND 36 ANTLERLESS (SHARE) TAGS TO
                          68 BULLS AND 57 ANTLERLESS
HARVEST APPROXIMATELY     ELK

                                   HERD SIZE      1600  ELK


              % OF BULLS KILLED BY HUNTERS        19.55  %
               % OF COWS KILLED BY HUNTERS            6  %
```

Based on harvest quotas and ~85% success

Adult mortality – non-hunting, including disease

```
INCREASED PROPOSAL: ADD 24 BULL AND 36 ANTLERLESS (SHARE) TAGS TO
                            68 BULLS AND 57 ANTLERLESS
HARVEST APPROXIMATELY       ELK

                                      HERD SIZE      1600  ELK
      % BULLS LOST TO NON HUNTING CAUSES             23.5  %
       % COWS LOST TO NON HUNTING CAUSES             11.9  %
```

Total mortality

```
NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019
(Combined Harvest for Del Norte and Humboldt cos)
              Ratio = 37/100/32 - Maximum Calf Survival = 40%
                 THIS PROGRAM CALCULATES CHANGES IN HERD
                 CHARACTERISTICS BASED ON VARIOUS HARVEST
                 RATES.

INCREASED PROPOSAL: ADD 24 BULL AND 36 ANTLERLESS (SHARE) TAGS TO
                            68 BULLS AND 57 ANTLERLESS
HARVEST APPROXIMATELY       ELK

                                     HERD SIZE      1600  ELK
       % BULLS LOST TO NON HUNTING CAUSES            23.5  %
        % COWS LOST TO NON HUNTING CAUSES            11.9  %
                % OF BULLS KILLED BY HUNTERS        19.55  %
                 % OF COWS KILLED BY HUNTERS           6  %
```

Estimated cow elk mortality: 17.9%

Documented cow elk mortality: ~8%

Disease considerations 2019 SED

- Cumulative effects section (pg. 31)

- TAHD
  - Not considered directly, however,
  - TAHD does not appear to cause direct mortality
  - TAHD does not appear to impact pregnancy rates or recruitment

- Underestimates of calf survival and overestimates of adult mortality provided a large buffer against additional (unexpected) mortality

Elk population comparisons: Washington vs. California

Mount St. Helen's Elk Herd, WA

- Extremely high densities
- Above carrying capacity for years
- Poor herd-level nutritional condition
- Active management to significantly reduce population numbers
- Harsh winter weather

Northwestern Hunt Zone, CA

- Lower population density
- Below carrying capacity
- High population-level nutritional condition
- Active management to reduce localized conflict and damage
- No harsh winter weather

2018 WDFW report

- Biased sampling on advanced stages of disease
  - Sample not representative of all disease stages
- No statistically significant differences in annual survival among disease and control groups
- Calf survival was similar between disease and control groups
- Potential susceptibility in a system with severe winters and existing nutritional stress

Conclusions and future efforts

- Conservative modeling effort
  - Higher levels of mortality assumed vs. observed
  - **Regulated harvest is not expected to jeopardize NW elk population**

- Continued surveillance
  - Determine prevalence and distribution
  - Inform future management actions

- Hunting
  - Key to surveillance
  - Primary tool for population management (disease, conflict)
  - Not hunting may have longer-term consequences to disease containment

Questions?

https://wildlife.ca.gov/Conservation/Mammals/Elk/Hoof-Disease

Janet Gilbert

September 3, 2020

RE: Agenda Items 4A, 5B

Dear California Fish and Game Commission:

Thank you for the opportunity to submit my comments for your September 17, 2020 WRC meeting.

I have concerns regarding the elk tag allotment numbers in the Northwest Hunt Zone for this year's upcoming hunt and, of course then, for next year's hunt. There has been increases in tag allotments every year without data to warrant. My concerns are also based on the recent discovery of TAHD in one Del Norte herd of elk, and the possible need of a "damage hunt" of the 30 elk who appear to be infected. This in and of itself is a large number to remove from a herd estimated at 200 elk. But if the General hunt, the SHARE hunt, and the PLM hunts are to also take place, it appears a truly significant number of Roosevelt elk, a subspecies of elk that was once almost extirpated and has not yet come close to reaching the CDFW target population numbers, are at risk.

The most recent population estimate based on an ongoing study finds 404 elk in Del Norte. This however is down from the previous year of over 450 elk. This data does not indicate a "population exploding" as the Deputy Director Stafford Lehr contended at the Fish and Game Commissioners meeting on August 20, 2020. I believe he might have meant that there are lots of calves this spring.

In 12 years of watching elk come through my property, this is the first year I have seen cows and calves. In years prior I have mainly had bachelor groups come through, and seeing a cow was a rare treat. A good calf crop is not, however, a population exploding. Calves really should not even be considered a member in a population until they reach reproductive age. A good calf crop could just as easily become good black bear or cougar meals. Predation, vehicle collision, poaching, disease, lack of nutritional food, climate change, fire, access to water, etc. all play a role in surviving to reproduce and then to successfully rear offspring. There is an accumulation of events that need to occur to ascertain populations' stabilities.

The TAHD in our local Roosevelt elk presents a new problem that the CDFW has not addressed. Washington and Oregon and Idaho are exploring options and conducting research, but not with any success as of yet and they mostly have far greater populations of elk than Northern California has. It is prudent that California proceed with caution and work to resolve the disease status. We need a management plan that addresses the disease and its potential to spread. We need to be conservative in our tag allotments overall and focus on disease transmission control and eradication. We need to understand herd dynamics to be able to predict outcomes of a highly social species' cohesiveness. We don't want to spread the disease to other local herds.

This commission needs to postpone the hunt until a management plan for TAHD is developed. As the disease is believed to be quite painful for an infected elk to walk, keep up with its herd, even acquire

enough nutrition, an animal welfare hunt should be conducted on the diseased elk. As we are learning with the Covid-19 pandemic, management plans are crucial and the disease needs to be studied. It is prudent to isolate wild animals from domestic animals. This separation can also serve as a preventative measure to reduce rick of disease spread.

Please remove domestic livestock from public lands. TAHD is genetically so similar to Bovine Digital Disease that microbiologists have hypothesized that TAHD is derived from BDD. BDD treponemes have mutated from domestic into the wild. "This is the first report describing isolation of DD treponemes from a wildlife host, suggesting that the disease may be evolving to include a wider spectrum of cloven-hoofed animals." ("Isolation of Digital Dermatitis Treponemes from Hoof Lesions in Wild North American Elk (Cervus elaphus) in Washington State, USA," Journal of Clinical Microbiology, January 2015, Volume 53. No. 1)

Please work with landowners to adequately fence their lands such that elk no longer have access to private lands and domestic animals no longer have access to public lands. This should help solve property damage problems, and help control diseases that could be transmitted from one species to another.

Please work with UC Davis Veterinary Medicine and Research to understand the disease process, and cumulative impacts, potentially prevent future outbreaks, and work towards a treatment regime. Is it possible to dart, tag, and radio collar the infected elk? While the elk is down, its hooves could be examined, cleaned, and medicine applied. The elk could be given a long acting antibiotic. There are one dose methods for treating bovine hoof diseases in England; this could be researched further.

The coastal Roosevelt elk have survived thousands of years here in North America. Given our human dominance and footprint on this planet presently, the elk will only survive if we permit them. I ask that we honor the web of life and see ourselves as one species among thousands; I ask that we work towards conserving each strand in the web; I ask that the Commission makes a conservative, prudent, data-driven decision and works toward a management document as required under CEQA.

Thank you for the opportunity to engage in the process.

Sincerely,

Janet Gilbert

CALIFORNIA FISH AND GAME COMMISSION - NONREGULATORY REQUESTS - ACTION

Revised 10/05/2020

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

Date Received	Name/Organization of Requestor	Subject of Request	Short Description	FGC Receipt Scheduled	FGC Action Scheduled	Staff Recommendation
8/6/2020	Morgan Patton, West Marin Environmental Action Committee	Consumptive activities at Duxbury Reef State Marine Conservation Area (SMCA)	Request increased enforcement patrols in the area of Duxbury Reef SMCA due to increased instances of consumptive activity and potential poaching. Want to ensure no-take restrictions are being enforced.	8/19-20/2020	10/14/20	FGC does not have enforcement staff; however, DFW has responded to the requestor through a letter (Exhibit 14.2), stating that DFW has increased its wildlife officer patrols in key tidepool areas where poaching has increased, including Duxbury Reef. DFW is also increasing its outreach efforts to inform visitors of regulations and tidepool best practices, and offered to collaborate with requestor. No FGC action recommended at this time.
8/6/2020	Jake Elzenga	Trout planting in the Merced River	Requests planting 50-75 trout in the Merced River west of Lake McClure. Concerned that fish cannot reach this stretch of river because water is diverted for irrigation and power generation.	8/19-20/2020	10/14/20	FGC does not make day-to-day management decisions such as fish stocking locations. No action recommended.

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Marine Region
1933 Cliff Dr. Suite 9
Santa Barbara, CA 93109
wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

August 18, 2020

Ms. Morgan Patton
Executive Director
West Marin Environmental Action Committee
morgan@eacmarin.org

RE: Duxbury Reef State Marine Conservation Area, Increased Consumptive Activities

Dear Ms. Patton,

Thank you for your letter and for your concern about California's marine resources. The California Department of Fish and Wildlife (Department) has received multiple similar reports across the state, in both intertidal and offshore areas. In particular, there has been a very significant increase in consumptive activities on the Palos Verdes Peninsula in southern California, but similar increases have been seen in other areas, including Duxbury Reef.

In response, we have increased our Wildlife Officer patrols in key locations and have issued citations to violators. I have forwarded your letter to our Law Enforcement Division to make sure they are aware of the potential hotspot of poaching activities in the Duxbury Reef SMCA.

We are also increasing our outreach efforts to inform anglers and non-consumptive visitors of fishing regulations and tidepool best practices. We greatly appreciate your offer to have additional docents provide outreach at Duxbury Reef and are happy to assist you with informational materials or messaging. We are also happy to participate in discussions regarding ongoing and future enforcement and outreach.

To schedule a meeting or for any additional information, please contact Mr. John Ugoretz, Pelagic Fisheries and Ecosystem Program Manager at john.ugoretz@wildlife.ca.gov or by phone at (562) 338-3068.

Sincerely,

Craig Shuman, D. Env.
Marine Regional Manager

Ec: John Ugoretz, Environmental Program Manager
Marine Region
John.Ugoretz@Wildlife.ca.gov

Becky Ota, Environmental Program Manager
Marine Region
Becky.Ota@Wildlife.ca.gov

Mike Stefanak, Assistant Chief
Law Enforcement Division
Mike.Stefanak@Wildlife.ca.gov

Bart Bundesen, Captain
Law Enforcement Division
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STATE OF CALIFORNIA
Gavin Newsom, Governor

Fish and Game Commission

Celebrating 150 Years of
Wildlife Heritage and Conservation!

Melissa Miller-Henson
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WILDLIFE RESOURCES COMMITTEE

Committee Co-Chairs: Commissioner Burns and President Sklar

September 17, 2020 Meeting Summary

Following is a summary of the California Fish and Game Commission (Commission) Wildlife Resources Committee (WRC) meeting as prepared by staff. An audio recording of the meeting is available upon request.

Call to order

The meeting was called to order at 8:34 a.m. by Co-Chair Sklar, who gave welcoming remarks.

Staff Services Analyst Cynthia McKeith outlined instructions for participating in Committee discussions. The following Committee members, and Commission and Department staff, attended:

Committee Co-Chairs

Eric Sklar	Present
Russell Burns	Absent

Commission Members

Pete Silva	Present

Commission Staff

Melissa Miller-Henson	Executive Director
Rachel Ballanti	Deputy Executive Director
Ari Cornman	Wildlife Advisor
Cynthia McKeith	Staff Services Analyst

Department Staff

David Bess	Chief, Law Enforcement Division
Stafford Lehr	Deputy Director, Wildlife and Fisheries Branch
Kevin Shaffer	Branch Chief, Fisheries Branch
Scott Gardner	Branch Chief, Wildlife Branch
Chris Stoots	Captain, Law Enforcement Division
Jay Rowan	Statewide Hatchery Program Manager, Fisheries Branch

Emma Lantz	Wildlife Veterinarian, Wildlife Branch
Brandon Munk	Wildlife Veterinarian, Wildlife Branch
Kristin Denryter	Coordinator, Elk and Pronghorn Program, Wildlife Branch
Victoria Monroe	Statewide Conflicts Program Coordinator, Wildlife Branch
Carrington Hilson	Environmental Scientist, Northern Region

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

Two commenters expressed concerns about the effects of wildfires on wildlife populations. One asked the Department to assess the damages and develop a rehabilitation plan. The other voiced concerns about toxic runoff from burned lands into Carmel Lagoon and the effects on fish. Co-chair Sklar stated that fires are part of California's ecosystems and that wildfire assessment is an ongoing task. Stafford Lehr affirmed the widespread effects of wildfires but noted that we are still in the initial response phase. The Department is focused on response efforts but is in conversations regarding postfire recovery options, including remediation of erosion problems and habitat restoration. He further stated that in many cases wildlife can outrun fires, but some losses are expected in fast-moving fire areas. The Department will not be able to conduct assessments until conditions are safe.

3. Department updates

(A) Wildlife Branch

Scott Gardner stated that the Department has signed a memorandum of understanding to expand the Oiled Wildlife Care Network at the University of California, Davis, to address wildlife that are impacted by wildfires. He mentioned the U.S. Forest Service public land closures and added that the Department has closed 49 specific properties in and adjacent to those lands. The Department has developed guidance to help keep the public and Department staff safe when hunting considering wildfire and COVID-19. Stafford Lehr expanded on the agreement with UC Davis, explaining that personnel from the Oiled Wildlife Care Network are being deployed to burn sites to rehabilitate injured and orphaned wildlife. The response is modeled after response paradigms from Australia.

(B) Fisheries Branch

Kevin Shaffer reminded meeting participants that most California species are adapted to fire. The Department is monitoring rare trout species and debris flow into hatcheries, and is coordinating with the U.S. Forest Service and volunteers on Kokanee salmon spawning issues. He discussed the bacterial infections at Department hatcheries and future changes to hatchery practices to support fisheries in light of these challenges. The Department is also working on Coho salmon recovery and watershed restoration, and is exploring new avenues for engagement.

(C) Law Enforcement Division

Chris Stoots underscored the unprecedented nature of this year's wildfires and the vital role of law enforcement in providing public safety. He encouraged the public to confirm that areas in which they intend to hunt are open before travelling to the location. Related news

releases can be found on the Department's Facebook page, along with stories about the heroism and commitment of Department officers responding to wildfires. Co-chair Sklar thanked members of the Law Enforcement Division for their work.

4. Recommendations for regulations

(A) Mammal Hunting

Stafford Lehr indicated that the Department has detected multi-year declining trends in one population of deer and one of antelope; hence, it is recommending reduction in tags for each. Additionally, based on the unprecedented nature of wholesale public and private land closures, the Department is proposing a rulemaking to allow the Department to partially refund, and restore the preference points of, elk and pronghorn antelope tag holders who were not able to hunt for a significant portion of the season. The proposed refund would be available for fourteen specific elk hunts and two specific antelope hunts. Hunters would need to return unfilled tags to be eligible for the refund. The Department anticipates a revenue impact of just over $75,000 and does not expect a significant loss of opportunity for deer hunters.

Discussion

A commenter stated that the National Park Service is expecting large losses of wildlife in the wake of wildfires, that the intensity of the fires may warrant soil treatment, and that wildlife are more stressed than normal. The president of the San Diego County Wildlife Federation thanked the Department for working with stakeholders on tag refunds. Another commenter noted appreciation that Roosevelt elk tag numbers were not being increased, expressed the desire that herd populations expand, and exhibited skepticism of Department claims regarding herd numbers and growth trends. Another commenter thanked the Department for working quickly on the tag refund and urged the Committee to recommend moving forward with the proposal. A County Supervisor echoed the sentiments expressed, explained that rising herd numbers had begun to disperse, affirmed the difficulty in getting accurate surveys, and stated that elk collisions with vehicles are increasing and are a sign of increasing elk numbers. A representative of the Center for Biological Diversity urged the Department to adopt an updated elk management plan and associated documents under the California Environmental Quality Act given the rise of treponeme-associated hoof disease.

A representative of the California Rifle and Pistol Association thanked the Department for supporting the hunter retention, recruitment, and reactivation (R3) program and for following the North American Model of Wildlife Conservation. A commenter stated that the Department's goal is to increase the elk population but appreciated that increases may not always be desirable for landowners; he urged the Department and Commission to be cautious when adopting new hunting quotas.

Ari Cornman advised hunters not to dispose of their unused elk and/or antelope tags, as they would likely be needed to claim refunds. He also noted that Commission staff recommended that WRC move the Department's proposal forward to the full Commission. Stafford noted that details on the Department's hunting model would be presented later in the meeting. He also remarked that the Department is committed to updating the North Coast Elk Management Plan as necessary. He reiterated that the mammal rulemaking proposal includes reductions in tags for certain deer and antelope hunts.

After the recommendation, Melissa Miller-Henson asked for confirmation that the intent of the recommendation was that the tag refund and preference point restoration be targeted at specific elk and antelope hunts that experienced a significant loss in opportunity due to the wildfires for this year only (as opposed to a broader authority for future years) and Co-Chair Sklar clarified that indeed was the intent.

Recommendation

The Wildlife Resources Committee recommended that the Commission support and issue a notice of proposed rulemaking for the proposed regulation changes for the mammal package as discussed, including (a) targeted reductions in antelope and deer tags, and (b) partial refunds and restoration of preference points for unused elk and antelope tags in selected hunts.

(B) Waterfowl Hunting

Stafford Lehr indicated that although Department and Commission staff had anticipated a waterfowl rulemaking package would not be necessary, a small rulemaking would be necessary to adjust dates so that the number of hunt days will not exceed the federal framework. Modifications to the falconry-only days means that the change must be effected through a rulemaking process.

(C) Central Valley Sport Fishing

Kevin Shaffer said that the Department's proposal includes a typical wide range of bag and possession limits for the different zones. More information will be available in December and upon receiving the Pacific Fishery Management Council recommendations in April 2021. No significant changes are anticipated.

(C) Klamath River Basin Sport Fishing

Kevin Shaffer said that the Department is unsure what the fishery will look like this year. The Department's proposal will contain the typical range of bag and possession limits as well as the size of two-year-old fish.

(D) Inland Sport Fishing

Since the May WRC meeting, Department staff, Commission staff, and the Northern California Guides and Sportsman's Association (NCGASA) have met to discuss boat limits for anadromous waters. There is increased clarity on the proposal, as well as some understanding of the need for potential associated regulatory changes that would be triggered by a change. Further discussions are needed before the Department or Commission staff can bring forth a recommended course of action, but WRC will receive a report on any further progress at its next meeting.

Discussion

A representative of NCGASA stated that the organization is looking forward to additional conversations on boat limits, as it is a long-standing priority for the inland guiding community. NCGASA supports the Department's proposals for the Central Valley sport fishing and Klamath River Basin sport fishing rulemakings. NCGASA was pleased with a three-fish bag limit on the Feather River, but water releases from Oroville Dam have been lacking, making Feather River flows remarkably low. Guides have had conversations with

the California Department of Water Resources about several issues. He stated that the Sacramento River conditions are somewhat better, though also difficult this year.

A representative of the California Waterfowl Association (CWA) agreed that a small, targeted rulemaking is warranted this year, but reminded WRC of CWA's proposal to take two days off the Canada goose season and transfer them to the opening of the late goose season in the Balance of the State Zone to maximize hunter opportunity for resident Canada geese and help with overabundant populations. CWA urged inclusion of the proposal in a future rulemaking. They thanked the Department for efforts to keep Wildlife Areas and refuges open and for the development of guidance for hunting amidst wildfires and COVID this season.

Recommendation

The Wildlife Resources Committee recommended that the Commission support the proposed regulation changes for waterfowl hunting, Central Valley Chinook sport fishing, and Klamath River Basin sport fishing for the 2021-22 seasons, as recommended by the Department.

5. Wildlife Diseases

(A) Disease Informational Items

The Committee received presentations on treponeme-associated hoof disease (TAHD), rabbit hemorrhagic disease, *Lactococcus garvieae*, and adenovirus hemorrhagic disease.

Discussion

A commenter thanked the presenters and asked what the public can look for to detect and report TAHD, what the Department is doing to be proactive, and what is being done to understand transmission. Another commenter asked about plans for testing "spillover" between bovine herds and elk, and whether there are differences between the Washington, Oregon, and California outbreaks. Another commenter asked about links to bovine digital dermatitis (BDD) and stressed the importance of facilitating migration and movement of elk to combat the disease. Another commenter was grateful that herd eradication is not being considered because it was ineffective, was pleased that stakeholders would be included in future management plan updates, stated that the bacteria was present in soil, was concerned about contagion of Tule elk, inquired about the possibility of citizen science initiatives, and stated that deceased animals due to disease should be counted as part of the total hunt quota.

Dr. Brandon Munk responded that the presence of treponeme bacteria does not always manifest in TAHD. Causation from BDD has not yet been definitively established. A major goal of the Department is to support ongoing research, and the Department has been working with disease labs in other states to further knowledge of TAHD. He affirmed that treponemes persist in soil where there is disease, but soil testing is not currently a priority. Dr. Emma Lantz echoed that we are still in the basic foundational stage of understanding these diseases, and the ultimate goal is to facilitate healthy herds and ecosystems that allow populations to withstand disease. Stafford Lehr added that the Department takes these diseases seriously, has top personnel studying and managing diseases, and seeks scientific collaboration as much as possible. Co-chair Sklar and Commissioner Silva expressed appreciation for the work of the Department in disease management.

Commissioner Silva asked about vaccine deployment in rabbits, and Emma answered that there is a large effort to trap and vaccinate riparian brush rabbits.

(B) Petition #2020-008: Elk hunting suspension

Stafford Lehr acknowledged public concern about population numbers and Department consideration of TAHD. The Committee received two presentations on the status of the North Coast Elk Management Unit and on the consideration of disease in the Department's calculations of harvest quotas and analysis in the supplemental environmental document. Stafford recognized that the Commission does not often get to see the inner workings of how recommendations come to fruition, and Co-chair Sklar added that it was a benefit of the longer, more detailed format of Committee meetings.

Discussion

A representative of the Environmental Protection Information Center expressed concerns that the Department is doing a *post hoc* rationalization for its allocation. He urged creation of a disease management plan (with consequent CEQA analysis) and pointed out that hunting can disrupt social structures, which can exacerbate the spread of diseases. He cited an example of a herd in Prairie Creek Redwood State Park where increases in elk taken resulted in herd disintegration. He urged a better understanding BDD and "spillover" from domestic animals.

A representative of the Rocky Mountain Elk Foundation stated that disease was fully considered in the supplemental environmental document, that TAHD is no threat to hunters who consume infected animals, and that hunter harvest is of great help to surveillance efforts. He urged that the petition be denied. Another commenter praised the Department for performing surveys and for the professionalism of its staff, but was not convinced by the data presented on elk numbers and asked for more transparency. She stated that smaller herds were declining, and some have lost their bulls.

A representative of the Center for Biological Diversity stated that diseased individuals face increased mortality threats, there are unknowns guiding the future of diseased elk herds, and current quotas were not designed with the condition of hunting infected elk; they expressed the hope that further research and management is forthcoming. Another commenter thanked WRC for providing information and stated that the "jury isn't out" concerning the connection between BDD and TAHD. She wondered how elk can get nutrition with damaged hooves, stating such indirect mortality should be taken into account.

A representative for the San Diego County Wildlife Federation opposed the petition because the wildfires have already reduced harvest and because hunters help provide data to the Department. Another commenter remarked that two years of population data is not enough to establish a trend and asked the Rocky Mountain Elk Foundation to collaborate with UC Davis and help to fund some research and monitoring. She offered her recent personal experiences seeing fewer bulls. A county supervisor thanked the state biologists for their transparency. He stated that, like the Commission, county officials try to balance perspectives between landowners and ecological values. He emphasized the importance of ensuring that dispersing elk can use public lands and that high reproduction rates be safeguarded. Another commenter exhorted that hunters provide conservation benefits and that eliminating hunting can cause ecological problems.

President Sklar offered his opinion that all the considerations had been “fully and thoughtfully” considered in the process that the Department used to analyze the elk herds for its hunt tag recommendation. Stafford remarked that he had committed multiple times to the public and WRC to increase transparency and noted that the peer-reviewed models and data that the Department uses are constantly improving. He was unsure if a disease management plan would be pursued, but noted that inputs to the model would be adaptively refined based on real-world conditions. He acknowledged the conflict caused by elk and that the Department is working with local residents, organizations, and tribes to address issues.

Recommendation

The Wildlife Resources Committee recommended that the Commission deny Petition #2020-008, based on the information presented and discussed at the meeting.

6. Restricted species

Stafford Lehr explained that under Commission authority, the Department issues permits for about 230 to 300 organizations that house restricted species; these facilities are also subject to federal rules. In the summer of 2019, a facility known as the Wildlife Waystation near Los Angeles that housed over 450 animals, including many exotic species, closed. Following financial hardship, the county and Department took over operation of the facility, and the Department became the trustee/caretaker. Providing care and finding new homes for the animals required initiating and incident command system involving about 60 employees and a cost of about $1.6 million. The bulk of the animals were eventually relocated, except for 32 chimpanzees.

Based on this incident, the Department has identified potential regulatory gaps such as the number of animals a facility can house, guarantees of financial stability, the robustness of evacuation plans, and the diversity and types of animals that can be kept. Standards for animal care in Section 671, Title 14 must be brought up to modern standards of animal care. As a start, he affirmed the Department’s commitment to restarting the animal welfare rehabilitation committee identified in statute.

Particularly with the onset of COVID-19, some facilities may not be as stable as they once were; if multiple facilities failed simultaneously, the financial burden would be high. The Department understands the value of these facilities and is committed to working closely with stakeholders on updating the regulations.

Discussion

A wildlife rehabilitator expressed appreciation that the Department and Commission will be exploring welfare issues for wildlife in long-term care and hopes to be involved in future discussions.

7. Human-wildlife conflicts

The Department presented on its human-wildlife conflict programs, providing an overview, and describing tracking and reporting, the Human Dimensions of Wildlife Conservation Unit, and other efforts and partnerships in which the Department is engaged.

Discussion

The Committee received presentations on urban coyote science from a stakeholder and a researcher.

A representative of the newly launched Cougar Conservancy introduced the organization and its mission to prevent and intervene in conflicts, empower communities through education, and work with landowners after incidents. They spoke about partnerships and projects in which they are currently engaged.

A retired Wildlife Services employee dismissed the idea of coexistence with coyotes in an urban environment. He recounted the story of a coyote that attacked humans due to being fed, stated that coyotes are not pack animals, rejected the efficacy of hazing coyotes, and encouraged communities to implement an action plan. Another commenter stated that as rabbits become rarer, coyotes will invade cities and prey upon cats; he advocated for raising rabbits to counteract this phenomenon. A wildlife rehabilitator remarked that coyotes are easy to deal with because they are intelligent, scare easily, and can be controlled through predator-proof fencing. She condemned feral cat feeding and “trap-neuter-reabandonment” programs, stating that removing food and shelter resources would control coyotes. She further stated communities should take responsibility for coyote issues instead of looking to the Commission. A commenter urged the Commission to have a roundtable on coyote issues, mentioned an online tracker to document coyote incidents, and urged the Committee to keep the topic on its agendas.

Stafford Lehr acknowledged the diversity of animals that create conflicts and the variety of incident types the Department confronts, with limited resources. The Human-Wildlife Conflict Working Group of the Association of Fish and Wildlife Agencies is collating peer-reviewed publications on urban coyote conflicts. Such conflicts have the attention of the Department at the highest levels, though there are no easy answers; California attitudes toward wildlife have changed rapidly.

Co-Chair Sklar offered that the process of refining regulations will be ongoing as we learn more and do better; he mentioned the Commission’s Terrestrial Predator Policy as a concrete step that had been taken previously. Commissioner Silva emphasized the importance of collecting good data to inform a management plan.

8. Bullfrogs and non-native turtles

Ari Cornman stated that the industry group had convened, had met three times, and was making good progress on target identification and assessment of threats. The agency group had met twice since the last WRC meeting, and was continuing threat identification. He indicated that the environmental/animal welfare group had taken a hiatus to allow the other groups to progress, but would start meetings again soon.

Ari also gave a presentation introducing the *Open Standards for the Practice of Conservation* and outlined the rationale for choosing that system. He gave a partial overview of the process being used by the stakeholder groups to develop various strategies and recommendations to the WRC.

Discussion

A representative of the Center for Biological Diversity (CBD) explained that Senate Bill 1175, concerning live markets, was passed with bipartisan support but was not signed into law due to a technicality. CBD urged the Department and Commission to implement the substance of the bill under existing authorities.

9. Future agenda items

The next WRC meeting is scheduled for January 17, 2020 by webinar/teleconference. Scheduled topics include:

- Update on progress of boat limit discussions
- Update on bullfrog and non-native turtle stakeholder engagement process

At the next Commission meeting, Commission staff will provide recommendations to continue some of the items from this meeting. Melissa Miller-Henson indicated that most likely those recommendations will include restricted species, further discussion of human-wildlife conflicts, and potentially an update from the Department on any new information regarding wildlife diseases.

Adjourn

The Committee adjourned at 1:21 p.m.

Wildlife Resources Committee (WRC) 2020-1 Work Plan
Scheduled Topics and Timeline for Items Referred to WRC by the California Fish and Game Commission

Updated October 5, 2020

		May 2020 Webinar/ Teleconference	Sep 2020 Webinar/ Teleconference	Jan 2021 Webinar/ Teleconference
Periodic Regulations				
Upland (Resident) Game Birds	Annual			
Inland Sport Fishing	Annual		X	X
Mammal Hunting	Annual	X	X/R	
Waterfowl	Annual	X	X/R	
Central Valley Salmon Sport Fishing	Annual	X	X/R	
Klamath River Basin Sport Fishing	Annual	X	X/R	
Regulations & Legislative Mandates				
Falconry	Referral for Review			
Restricted Species	Regulatory		X	X
Special Projects				
American Bullfrog and Non-native Turtle Stakeholder Engagement Project	Referral for Review	X	X	X
Wildlife Diseases	Referral for Review		X	
Human-Wildlife Conflict	Information		X	X

KEY: X Discussion scheduled X/R Recommendation developed and moved to FGC

State of California
Fish and Game Commission
Statement of Reasons for Regulatory Action
(Pre-Adoption Statement of Reasons)

Amend Sections 3.00, 4.00, 5.00, 5.41, 5.85, 7.00, 7.50, 8.10
Add Sections 5.84, 5.89, 7.40
Title 14, Code of Regulations
Re: Simplification of Statewide Inland Sport Fishing Regulations

I. Date of Initial Statement of Reasons: May 6, 2020

II. Date of Pre-adoption Statement of Reasons: September 24, 2020

III. Dates and Locations of Scheduled Hearings

(a) Notice Hearing

Date: June 25, 2020 Location: Teleconference

(b) Discussion Hearing

Date: August 20, 2020 Location: Teleconference

(c) Adoption Hearing

Date: October ~~15~~14, 2020 Location: Teleconference

IV. Description of Modification of Originally Proposed Language of Initial Statement of Reasons (ISOR):

The following non-substantive corrections and clarifications are made to the proposed regulatory text as follows:

1. Editorial corrections for consistency throughout – names of months were reduced to three letter abbreviations, names of days of the weeks were reduced to three letter abbreviations, and County and Counties were abbreviated to “Co.” and “Cos.” to ease table congestion and make it easier to read.
2. Numbers zero to ten are spelled out when written in a sentence but used in the numerical form when reference bag limits within sections 7.40 and 7.50 to ease table congestion and make it easier to read.
3. References to low-flow restrictions have been edited to reference “Section 8.00 (or Subsection 8.00 where subsections are identified) Low-Flow Restrictions” throughout. The use of the word “below” when used as an adjective identifying another section in Title 14 is marked for deletion and the reference section is clarified.
4. 7.50(b)(4) - American River – adds end parenthesis after “except Caples Creek (see Section 7.50(b)(24)). (Page 53)
5. 7.50(b)(4) - American River – El Dorado is misspelled in existing text, and has been corrected. (Page 53)
6. 7.50(b)(24) - Caples Creek – remove underline from “A6” in the column for “Menu

Option." (Page 63)

7. 7.50(b)(47) Fall River Complex – Complex was added to the Fall River tributaries but it was not made clear that the complex includes Lava Creek, Little Tule River, Tule River, Horr Pond, Ja She Creek, Big Lake, Thousand Springs, Spring Creek, Ahjumawi Lava Springs, and Eastman Lake. (Page 66)
8. 7.50(b)(86) - Mammoth Pool – the "5 trout" should not be underlined as they are existing regulations. (Page 86)
9. 7.50(b)(88) new reg text – Martis Lake, the old (B) Martis Lake tributaries was deleted, and new proposed language was added under "Open season and special reg" column, making it appear twice in the noticed text. The duplicate cell of text is deleted. (Page 87)
10. Former 7.50(b)(101) - Little Cottonwood Creek – inserted missing deletion code "Del05." (Page 94)
11. 7.50(b)(125)(E) - Sacramento river and tributaries – (E) should be shown as stricken text, as this subsection is moving to Hatchery Steelhead and Salmon waters (HSS) in Section 7.40. Previously shown without strikeout. (Page 104)
12. 7.50(b)(125)(E) Sacramento River and tributaries - the text change justification "HSS" for the deletion of (E) is added in the column for "Menu Option" (this column is removed for the Final Statement of Reasons (FSOR) because it was absorbed into subsection (C). (Page 104)
13. 7.50(b)(130) - Santa Ana River – was moved from the district text to the text in 7.50, but it was not noted in the ISOR list. There is no change to the regulation aside from moving from one section to another. (Page 110)
14. 7.50(b)(155) - Tuolumne River – remove underline from "A3" in the column for "Menu Option"). (Page 122)
15. 7.50(b)(156.5) – removes a staff note inadvertently left in during draft review of the text that said "Use New Language" and was not a part of official text. (Page 104)
16. 7.50(b)(166) - Wolf Creek far right column should say "J" for closed to fishing all year. (There is no change to the current status of closed to fishing all year.) (Page 136)
17. 7.50(b)(168) - Yuba River, Middle Fork – the reference to Milton Lake (7.50(b)(97)) should show the previous subsection "~~(120)~~" for Milton Lake stricken out and the new subsection "(97)" to be underlined. (Page 136)
18. 7.50(b)(186)(B) - removes underlined from stricken text previously shown in strikeout/underline. (Page 125)
19. ISOR, page 15: 7.50(b)(144) - South Lake – regulatory text (page 125) correctly lists as located in Inyo County, however the ISOR incorrectly stated "Mono Co."
20. ISOR, page 15: the list of new waters NEW 7.50(b)(156) Twin Lakes, Upper and Lower (Bridgeport, Mono Co) should be 7.50(b)(157) which will be corrected in the FSOR.
21. ISOR, page 15: referenced "Twelvemile Creek" as subsection "X" instead of the new subsection number of "(156)."
22. 7.40(b)(50) Klamath River Basin – Basin was added to distinguish the area of the river accessible to anadromous salmonids. The reference to salmon punch card requirements is removed, as it now appears in the section for anadromous waters under 7.40(b)(50)(A)3., and the reference to 7.00 District General Regulations was corrected

to reflect that changes to subsection 7.00(a). (Pages 27-28)

23. 7.40(b)(50) Klamath River Basin – The last sentence references “General Regulations” twice. One instance was removed. (Page 28)

24. Truckee River Management Options, Section 7.50(b), re-numbered subsections (153)(B), (153)(C), and (153)(D) (formerly 196):

    At the Commission’s April 15, 2020 meeting, George Osborn, representing Mr. Montna, requested that the Commission consider Mr. Montna’s proposal as an alternative to the Department’s proposed regulations for the Truckee River, subsections (153)(B), (C), and (D). The Commission directed the Department to add a regulatory option to allow further consideration of Mr. Montna’s proposal. At the Commission’s August 20, 2020 meeting, George Osborn stated that a compromise agreement was made between parties supporting Option 1 and Option 2 and the Department, utilizing language from both, and existing language as follows (and on page 130):

a) For subsection (153)(B), select Option 2 as written:

(B) Truckee River from the confluence of Trout Creek downstream to the ~~Glenshire Bridge.~~ mouth of Prosser Creek.	~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used.~~ All year. Only artificial flies with barbless hooks may be used.	~~2 trout~~0 trout
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~

b) For subsection (153)(C), select a no change alternative (supported by those in favor of Option 1) as written

(~~D~~C) Truckee River from the mouth of Prosser Creek downstream to the Nevada State Line.	Last Saturday in Apr. through Nov. 15. ~~Minimum size limit: 14 inches total length.~~ Only artificial lures with barbless hooks may be used.	2 trout
	Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.	0 trout

V. Comments and responses to Fall River Conservancy

1. Comment: Fall River Complex should be protected by a zero bag limit and barbless hooks

Response: The Department does not believe the proposed limited harvest season and associated bag limits will negatively affect the trout population. Additionally, the Department sees no evidence the current available harvest regulation is resulting in a population level effect. The Department supports the opportunity for harvest during non-critical periods/areas and has proposed closures and zero bag limits with barbless hooks under this premise.

2. Comment: Allowing year-round angling would likely present a serious risk of impairing the spawning season in the Fall River Complex, especially in the upper reaches downstream from Thousand Springs.

Response: Bear Creek is one of the primary spawning areas in the upper reaches of the Fall River Complex (FRC) and will have significant protective measures from the proposed seasons/closures. Spring Creek is another spawning tributary in the upper FRC and is on private property, hence the effects to the spawning fish is limited by access and no harvest during the spawning periods. Also, in response to public input to protect the fall and spring spawning trout population in Bear Creek, the Department is proposing to shorten the current angling season on Bear Creek from Saturday preceding Memorial Day through November 15 to Saturday preceding Memorial Day through September 30. Harvest will be allowed during the summer months when the majority of the fluvial adult spawning fish have left the tributaries. Additional protective catch and release regulations are proposed during migratory periods (spring/fall) in the remaining FRC to allow sustainable angling opportunity.

3. Comment: Ahjumawi Lava Springs and Eastman Lake should be protected by the same angling regulations that apply to other parts of the Fall River Complex.

Response: The “Fall River Complex” would encompass these waters; Ahjumawi Lava Springs and Eastman Lake as well as other waters within the complex. The “Fall River Complex” should also include, but not limited to Lava Creek, Little Tule River, Tule River, Horr Pond, Ja She Creek, Big Lake, Thousand Springs, and Spring Creek. Bear Creek is the only water within the system that would not fall under the “Fall River Complex” as it will have its own regulations. For clarity purposes, each of the above-mentioned waters will be listed under the “Fall River Complex” regulation in Section 7.50, Alphabetical List of Trout Waters with Special Fishing Regulations.

Proposed Regulatory Language

Section 3.00, Title 14, CCR, is amended to read:

§ 3.00. Fishing Hours.

(a) Day Defined: One hour before sunrise to one hour after sunset. Remaining hours are night.

(b) All fish may be taken day or night, except as follows:

(1) WATERS WITH RESTRICTED FISHING HOURS FOR ALL SPECIES:

(A) American River between Business 80 and Nimbus Dam (Sacramento Co.): Night fishing prohibited.

(B) Heenan Lake, (Alpine Co.): See section 7.50(b)~~(76)(A)~~(56).

(C) Mono Co.~~unty~~: Night fishing is prohibited in all Mono Co.~~unty~~ waters except Topaz Lake, where fishing is prohibited from two hours after sunset to one hour before sunrise.

(D) Tahoe Lake (Placer and El Dorado ~~Cos~~cos.): Fishing is prohibited from two hours after sunset to one hour before sunrise.

(2) WATERS WHERE NIGHT AND DAY FISHING IS ALLOWED, BUT NO TROUT OR SALMON MAY BE TAKEN AT NIGHT:

(A) North Coast District

(B) North Central District, all waters except no fishing hour restrictions at Berryessa Lake (Napa Co.) and Mendocino Lake (Mendocino Co.)

(C) South Central District, all waters except no fishing hour restrictions at Coyote Lake (Santa Clara Co.)

(D) Valley District, north of Interstate 80, all waters except no fishing hour restrictions at Camp Far West Lake (Nevada, Placer, and Yuba cos.), Collins Lake (Yuba Co.), Oroville Lake (Butte Co.) and Wildwood Lake (Nevada Co.)

(E) Shasta, Siskiyou, Lassen, and Tehama Cos.~~counties~~.

Also, see Section 27.56.

Note: Authority cited: Sections 200, 205, 265, 270 and 275, Fish and Game Code. Reference: Sections 110, 200 and 205, Fish and Game Code.

Proposed Regulatory Language

Section 4.00, Title 14, CCR, is amended to read:

§ 4.00. Bait - General.

Legally acquired and possessed invertebrates, mollusks, crustaceans, amphibians (except salamanders), fish eggs and treated and processed foods may be used for bait, except:

(a) No species specified as endangered, threatened, candidate, fully-protected, or otherwise protected under state and federal law may be used as bait.

(b) No salamander may be used as bait. See section 5.05 for other amphibians that may be used as bait.

(c) See Section 5.35 for restrictions on crayfish;

(d) See Section 7.50(b)(~~74~~55) for restriction on bait collecting on Hat Creek;

(e) No trout may be maintained or possessed in a live condition in any container on or attached to any boat;

(f) Except for restrictions listed under special regulations, dead ocean fish may be used as bait statewide. This section supersedes the provisions of sections 4.10, 4.15, 4.20, 4.25 and 4.30.

Note: Authority cited: Sections 200, 205 and 265, Fish and Game Code. Reference: Sections 200, 201, 205, 265 and 5505, Fish and Game Code.

Proposed Regulatory Language

Section 5.00, Title 14, CCR, is amended to read:

§ 5.00. Black Bass.

It is unlawful to take or possess black bass except as provided ~~below~~in this section:

(Note: Some waters are closed to all fishing under sections 7.40 and 7.50.)

(a) General Statewide sRegulations:

(1) Lakes/Reservoirs and the Sacramento-San Joaquin Delta: The following waters, except for those listed in subsection (b) Special Regulations (below), are open to fishing all year, with a 12-inch total length minimum size limit and a five-fish daily bag limit: All lakes and reservoirs in the State, and the Sacramento-San Joaquin River Delta, (see Section 1.71 for definition of the Delta).

(2) Rivers/Streams and Private Ponds: Rivers, streams, canals, and lakes or ponds entirely on private lands, which are not listed in subsection (b) Special Regulations (below), are open all year with no size limit and a five-fish daily bag limit.

(b) Special Regulations: Counties and individual waters listed below are those having regulations different from the General Statewide Restrictions in subsection (a).

DISTRICTS AND COUNTIES WITH SPECIAL REGULATIONS

Area or Body of Water	Open Season	Size (total length)	Bag Limit
~~DISTRICTS AND COUNTIES WITH SPECIAL REGULATIONS~~			
(1) Colorado River District: All waters (Bag and size limits conform with Arizona regulations.).	All year.	13-inch minimum.	6
(2) Inyo Co.~~unty~~: all streams east of Highway 395 from the southern Inyo Co.~~unty~~ line north to the junction of Highway 6 and east of Highway 6 to the Mono Co.~~unty~~ line~~.~~, except those streams listed by name in Section 7.50(b), Special Fishing Regulations.	All year.	12-inch minimum.	5
The remaining streams of Inyo Co.~~unty~~, except those waters listed in ~~sections~~Section 7.50(b)~~(82) and 7.50(b)(134)~~, Special Fishing Regulations.	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~November~~ 15. Closed to bass fishing from Nov.~~ember~~ 16 through the Fri.~~day~~ preceding the last Sat.~~urday~~ in Apr.~~il~~.	12-inch minimum.	5
All Lakes, Big Pine Canal, Fish Spring Canal, and Millpond in Inyo Co.~~unty~~.	All year.	12-inch minimum.	5
~~(3) Lassen County: all waters.~~	~~All year.~~	~~No size limit.~~	~~5~~
~~(4) Modoc County: all waters except Dorris and Big Sage Reservoirs (see subsection (a)(1)).~~	~~All year.~~	~~No size limit.~~	~~10~~

(~~5~~3) Mono Co.~~unty~~: all ~~waters~~streams except for Fish Slough (see subsection (b)(~~16~~10)) and those waters listed ~~as closed to all fishing in Section 7.50.~~by name in Section 7.50(b), Special Fishing Regulations.	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~November~~ 15. Closed to bass fishing from Nov.~~ember~~ 16 through the Fri.~~day~~ preceding the last Sat.~~urday~~ in Apr.~~il~~.	No size limit.	5
(~~6~~4) Plumas Co.~~unty~~: all waters.	All year.	No size limit.	5
~~(7) Shasta County: all lakes except Britton, Shasta and Whiskeytown lakes (see subsection (a)(1) and Big Lake (see subsection (b)(9)).~~	~~All year.~~	~~No size limit.~~	~~5~~

INDIVIDUAL BODIES OF WATER WITH SEPCIAL REGULATIONS

~~INDIVIDUAL BODIES OF WATER WITH~~	
~~SPECIAL REGULATIONS~~	

Area or Body of Water	**Open Season**	**Size (total length)**	**Bag Limit**
(~~8~~5) Barrett Lake (San Diego Co.~~unty~~). (Also see Section 2.08)	All year.	No black bass shall be possessed.	0
~~(9) Big Lake (Shasta County) (Also see Section 7.00(b)(4))~~	~~Last Saturday in Apr through Nov. 15.~~	~~12-inch minimum~~	~~5~~
	~~Nov. 16 through last Friday in April.~~	~~No black bass shall be possessed.~~	~~0~~
(~~10~~6) Casitas Lake (Ventura Co.~~unty~~).	All year.	12-inch minimum. No more than one over 22 inches.	5
(~~11~~7) Castaic Lake (Los Angeles Co.~~unty~~).	All year.	15-inch minimum.	5
(~~12~~8) Cuyamaca Lake (San Diego Co.~~unty~~).	All year.	No size limit. No smallmouth bass shall be possessed.	5
~~(13) Diamond Valley Lake, (Riverside County)~~	~~All year.~~	~~Largemouth bass 15-inch minimum. No smallmouth bass shall be possessed.~~	~~5~~
(~~14~~9) Eastman Lake (Madera and Mariposa ~~Cos.~~cos.) ~~(Note: See Section 7.50(b)(62) for special area closures).~~	All year.	22-inch minimum.	1
~~(15) El Capitan Reservoir (San Diego County).~~	~~All year.~~	~~12-inch minimum.~~	~~5~~
(~~16~~10) Fish Slough (Mono Co.~~unty~~), except the fenced portions of Fish Slough within ~~Owens Valley Native Fishes Sanctuaries and~~ the BLM Spring, which are closed to all fishing all year. See Section 7.50(b)(49), Special Fishing Regulations.	All year.	No size limit.	5

(~~17~~11) Hensley Lake (Madera Co.~~unty~~).	All year.	15-inch minimum.	2
(~~18~~12) Hodges Lake (San Diego Co.~~unty~~).	All year.	15-inch minimum.	5
(~~19~~13) Isabella Lake (Kern Co.~~unty~~).	All year.	15-inch minimum.	2
(~~20~~14) Kaweah Reservoir (Tulare Co.~~unty~~).	All year.	15-inch minimum.	2
(~~21~~15) Lett's Lake (Colusa Co.~~unty~~).	All year.	No size limit.	5
~~(22) Perris Lake (Riverside County).~~	~~All year.~~	~~12-inch minimum.~~	~~5~~
(~~23~~16) Plaskett Meadows lakes, upper and lower (Glenn Co.~~unty~~).	All year.	No size limit.	5
(~~24~~17) Shaver Lake (Fresno Co.~~unty~~).	All year.	No size limit.	5
~~(25) Silverwood Lake (San Bernardino County).~~	~~All year.~~	~~15-inch minimum.~~	~~2~~
~~(26) Skinner Lake (Riverside County).~~	~~All year.~~	~~15-inch minimum.~~	~~2~~
(~~27~~18) Success Reservoir (Tulare Co.~~unty~~).	All year.	15-inch minimum.	2
~~(28) Trinity Lake (Trinity County).~~	~~March 1 through May 31~~	~~12-inch minimum.~~	~~2~~
	~~June 1 through last day in Feb.~~	~~12-inch minimum.~~	~~5~~
~~(29) Trout Lake (Siskiyou (County).~~	~~Only weekends and Wednesdays from the last Saturday in April through Sept. 30.~~.	~~22-inch minimum. Only artificial lures may be used.~~	~~1~~
(~~30~~19) Upper Otay Lake (San Diego Co.~~unty~~). (Also see Section 2.08).	All year.	No black bass shall be possessed.	0

Note: Authority cited: Sections 200, 205, 265, 270 and 275, Fish and Game Code. Reference: Sections 200 and 205, Fish and Game Code.

Proposed Regulatory Language

Section 5.41, Title 14, CCR, is amended to read:

§ 5.41. Landlocked Salmon.

(a) Open season: All year.
(b) Daily bag limit: Five.
(c) Possession limit: Ten.
(d) Size limit: None.
(e) ~~See exceptions in Section 7.50(b) for Bucks Lake, Lake Pardee, New Bullards Bar Reservoir, upper Scotts Flat Reservoir, and Trinity Reservoir~~Exceptions:
(1) Bucks Lake (Plumas Co.), New Bullards Bar Reservoir (Yuba Co.), Pardee Lake (Amador Co.), Upper Scotts Flat Reservoir (Nevada Co.), and Trinity Lake (Trinity Co.), which shall be subject to the following limits:
(A) Daily bag limit: Ten
(B) Possession limit: Twenty
Note: Authority cited: Sections 200, 205, 219 and 265, Fish and Game Code. Reference: Sections 200, 205 and 265, Fish and Game Code.

Proposed Regulatory Language

Section 5.84, Title 14, CCR, is added to read:

§ 5.84. Brook Trout.
(a) Open season: All year.
(b) Limit: Ten.
(c) Size limit: Less than 10 inches total length.
(d) Brook Trout bag limits may be taken in addition to the statewide trout daily bag and possession limits specified in Section 5.85.
(1) Exceptions:
(A) Red Lake in Alpine Co.~~unty~~.
(B) All waters in Section 7.50(b), Alphabetical List of Trout Waters with Special Fishing Regulations.
Note: Authority cited: Sections 200, 205, 219, 265 and 275, Fish and Game Code. Reference: Sections 200, 205, 255, 265, 270 and 275, Fish and Game Code.

Proposed Regulatory Language

Section 5.85, Title 14, CCR, is amended to read:

§ 5.85. Trout~~ and Salmon~~.

~~See Chapter 3, District Trout, Salmon and Special Regulations.~~

As used in this section, daily bag and possession limits, unless otherwise noted, mean the total number of trout in combination, including but not limited to rainbow, golden, brown, and cutthroat.

(a) General Statewide Regulations:

(1) All inland lakes, reservoirs, and ponds entirely on private lands, except those listed in Section 7.50(b), are open to fishing all year with a five-trout daily bag limit, and 10 trout possession limit.

(2) All inland streams, rivers, and canals, except those listed in Section 7.50(b), are open to fishing from the last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15, with a five trout daily bag limit, and ~~10~~ten trout possession limit, with no gear restrictions. From Nov.~~ember~~ 16 through the Fri.~~day~~ preceding the last Sat.~~urday~~ in Apr.~~il~~, a ~~0 (~~zero~~)~~ trout bag limit applies, and only artificial lures with barbless hooks may be used. In waters where the bag limit for trout is ~~0 (~~zero~~)~~, trout must be released unharmed, and should not be removed from the water.

(3) Exceptions:

(A) All waters in Section 7.50(b), Alphabetical List of Trout Waters with Special Fishing Regulations, are those having regulations different from the General Statewide Regulations for trout.

(B) Brook Trout bag and possession limits may be taken in addition to the statewide trout daily bag and possession limits. See Section 5.84.

Note: Authority cited: Sections 200, 205, 219, 265 and 275, Fish and Game Code. Reference: Sections 200, 205, 255, 265, 270 and 275, Fish and Game Code.

Proposed Regulatory Language

Section 5.89, Title 14, CCR, is added to read:

§ 5.89. Salmon
See Chapter 3, Trout, Salmon and Special Regulations
Note Authority cited: Sections 200, 205, 219, 265 and 275, Fish and Game Code. Reference: Sections 200, 205, 255, 265, 270 and 275, Fish and Game Code.

Proposed Regulatory Language

Section 7.00, Title 14, CCR, is amended to read:

§ 7.00. District General Regulations

Unless otherwise provided, waters shown as open to hatchery trout-and hatchery steelhead fishing in subsections (a) through (g) below, are open to fishing for other species. Gear restrictions listed in this section apply to the take of all species of fish unless otherwise noted. Every body of water listed in subsections (a) through (g) of Section 7.00 (below) is closed to all fishing, except during the open season as shown. Unless otherwise provided, waters closed to hatchery trout-and hatchery steelhead fishing are closed to fishing for all other species, except that these closures do not apply to fishing for amphibians (see Section 5.05), freshwater clams (see Section 5.20), crayfish (see Section 5.35), and lamprey (see Section 5.40), using legal fishing methods other than hook-and-line fishing, and saltwater clams, crabs, ghost shrimp, and blue mud shrimp (see Ocean Regulations Booklet ~~Sections~~sections 29.20 to 29.87). Crabs may only be taken using hoop nets or by hand, and Dungeness crab may only be taken within the North Coast District and Sonoma and Mendocino Cos.~~counties~~.

Daily bag and possession limits, unless otherwise provided, mean the total number of hatchery trout and hatchery steelhead. Unless otherwise provided, no more than one daily bag limit may be possessed. Coho (silver) Salmon may not be taken in any of the waters of the State. Incidentally hooked Coho (silver) Salmon must be immediately released unharmed to the waters where they are hooked. In waters where the bag limit for hatchery trout and hatchery steelhead is zero, fish for which the bag limit is zero must be released unharmed, and should not be removed from the water. These waters may also be subject to restrictions on fishing methods and gear (sections 2.00 through 2.45), fishing hours (~~section~~Section 3.00), and the use of bait (sections 4.00 through 4.30).

(a) North Coast District

District/Water	*Open Season and Special Restrictions*	*Daily Bag and Possession Limit*
~~(a) North Coast District~~		
~~(1) All lakes and reservoirs except those listed by name in the Special Regulations.~~	~~All year.~~	~~5 trout per day. 10 trout in possession.~~
(~~2~~1) Anadromous waters of the Klamath and Trinity River ~~S~~systems, and those entering the ocean south of Humboldt Bay, which are not listed in the Special Regulations.	Closed to all fishing all year.	
(~~3~~2) All anadromous waters tributary to Humboldt Bay, and north of Humboldt Bay, except those of the Klamath and Trinity river systems and those listed by name in the Special Regulations.	Fourth Sat.~~urday~~ in May through Oct. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead*. 4 hatchery trout or hatchery steelhead* in possession. Closed to the take of salmon.
~~(4) All streams except anadromous waters and those listed by name in the Special Regulations.~~	~~Last Saturday in Apr. through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~

~~(NOTE: A list of the non-anadromous waters opened to trout fishing (STREAMS AND PORTIONS OF STREAMS NOT LISTED IN THE SPECIAL REGULATIONS THAT ARE OPEN TO TROUT FISHING FROM THE LAST SATURDAY IN APRIL THROUGH NOVEMBER 15 (New 6-12-98), which is incorporated by reference herein) is available from the Department's Region 1 Office, 601 Locust Street, Redding, CA 96001 (Telephone: (530) 225-2300).~~

~~(5) SPECIAL BROOK TROUT BONUS BAG AND POSSESSION LIMIT: UP TO 10 BROOK TROUT PER DAY LESS THAN 8 INCHES TOTAL LENGTH MAY BE TAKEN AND POSSESED IN ADDITION TO THE OTHER DAILY BAG AND POSSESSION LIMITS SPECIFIED FOR THE NORTH COAST DISTRICT~~

(b) Sierra District

~~(b) Sierra District~~*District/Water*	*Open Season and Special Restrictions*	*Daily Bag and Possession Limit*
(1) All rivers and associated tributaries above Lake Shasta.	Closed to the take of salmon.	
(2) Anadromous waters of Tehama and Shasta Cos.~~counties~~ not listed in the Special Regulations. (Section ~~7.50~~7.40). (See subsections ~~(b)(156) and~~ (b)(~~156.5~~80) of Section ~~7.50~~7.40 regarding the Sacramento River.)	Last Sat.~~urday~~ in Apr. through Nov. 15. Only artificial lures ~~and~~with barbless hooks may be used.	2 hatchery trout or hatchery steelhead*. 4 hatchery trout or hatchery steelhead* in possession. Closed to the take of salmon.
~~(3) All lakes and reservoirs except those in the Fall River Valley, those in Inyo and Mono counties and those listed by name in the Special Regulations.~~	~~All year.~~	~~5 trout per day. 10 trout in possession.~~
~~(4) All streams, lakes and reservoirs in Inyo and Mono counties, except those listed by name in the Special Regulations.~~	~~Last Saturday in Apr. through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~
~~(5) All streams, lakes and reservoirs in the Fall River Valley above the Pit No. 1 PG&E Diversion Dam on Fall Riverin Shasta County, except those listedby name in the Special Regulations.~~	~~Last Saturday in Apr. through Nov. 15.~~	~~2 trout~~
~~(6) All streams in Lassen and Modoc counties east of Highway 395 and north of Clarks Valley Road. Clarks Valley Road is defined as those portions of county routes 510, 512 and 506 running easterly from the town of Madeline to the Nevada border.~~	~~Saturday preceding Memorial Day through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~
~~(7) All other streams except those listed by name in the Special Regulations.~~	~~Last Saturday in Apr. through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~
~~(8) Mono County waters, when closed to trout fishing, are closed to all fishing, except for the unrestricted portions of Fish Slough which are open to fishing all year. Also, see Mono County waters listed in sections 5.00 and 7.50.~~		

~~(9) SPECIAL BROOK TROUT BONUS BAG AND POSSESSION LIMIT:~~
~~(A) IN SIERRA DISTRICT WATERS OF SISKIYOU, SHASTA AND TEHAMA COUNTIES, UP TO 10 BROOK TROUT PER DAY LESS THAN 8 INCHES TOTAL LENGTH MAY BE TAKEN AND POSSESSED IN ADDITION TO THE OTHER DAILY BAG AND POSSESSION LIMITS SPECIFIED FOR THE SIERRA DISTRICT.~~
~~(B) IN THE SIERRA DISTRICT SOUTH OF INTERSTATE 80, UP TO 10 BROOK TROUT PER DAY LESS THAN 10 INCHES TOTAL LENGTH MAY BE TAKEN AND POSSESSED IN ADDITION TO~~

~~THE OTHER DAILY BAG AND POSSESSION LIMITS SPECIFIED FOR THE SIERRA DISTRICT. THIS ALLOWANCE DOES NOT INCLUDE RED LAKE IN ALPINE COUNTY OR KIRMAN, LANE OR ROOSEVELT LAKES IN MONO COUNTY.~~

(c) North Central District

~~(c) North Central District~~*District/Water*	*Open Season and Special Restrictions*	*Daily Bag and Possession Limit*
~~(1) All lakes and reservoirs except those listed by name in the Special Regulations.~~	~~All year.~~	~~5 trout~~
(~~2~~1) All streams except those listed by name in ~~the~~ Section 7.40, Special Regulations.	Closed to all fishing all year.	
(~~3~~2) The tidewaters of all streams except those listed by name in ~~the~~ Section 7.40, Special Regulations. Note: Some waters within this district are tide waters regulated by regulations for the ocean and San Francisco Bay District (see sections 1.53 and 27.00).	Closed to all fishing all year.	

(d) Valley District

~~(d) Valley District~~*District/Water*	*Open Season and Special Restrictions*	*Daily Bag and Possession Limit*
~~(1) All lakes and reservoirs except those listed by name in the Special Regulations.~~	~~All year.~~	~~5 trout~~
(~~2~~1) All anadromous waters except those listed by name in ~~the~~ Section 7.40, Special Regulations (See definition of anadromous waters, Section 1.04).	All year.	2 hatchery trout or hatchery steelhead*. 4 hatchery trout or hatchery steelhead* in possession. Closed to the take of salmon.
~~(3) All streams except anadromous waters and those listed by name in the Special Regulations.~~	~~All year~~	~~5 trout~~

(e) South Central District

~~(e) South Central~~*District/Water*	*Open Season and Special Restrictions*	*Daily Bag and Possession Limit*
~~(1) All lakes and reservoirs except those listed by name in the Special Regulations.~~	~~All year~~	~~5 trout~~
(~~2~~1) That portion of any stream west of any Highway 1 bridge except those listed by name in ~~the~~ Section 7.40, ~~special~~Special ~~regulations~~Regulations.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead*. 4 hatchery trout or hatchery steelhead* in possession. Closed to the take of salmon.
(~~3~~2) All streams in Alameda, Contra Costa, and Santa Clara ~~C~~ Cos.~~counties~~ except those listed by name in ~~the~~ Section 7.40, Special Regulations.	~~Last Saturday in Apr. through Nov. 15~~Closed to the take of salmon.	~~5 trout Closed to the take of salmon.~~
(~~4~~3) All other streams and portions of streams except those listed in	Closed to all fishing all year.	

subsection (e)(~~2~~1) above or by name in ~~the~~ Section 7.40, Special Regulations.		

(f) Southern District

~~(f) Southern~~*District/Water*	*Open Season and Special Restrictions*	*Daily Bag and Possession Limit*
~~(1) All lakes and reservoirs except those listed by name in the Special Regulations.~~	~~All year.~~	~~5 trout~~
~~(2) All streams except anadromous waters in San Diego County, and except those listed by name in the Special Regulations.~~	~~All year. Only artificial lures with barbless hooks may be used.~~	~~2 trout~~
~~(3) All streams except anadromous waters in Los Angeles, Ventura, Santa Barbara, Orange, San Bernardino and Riverside Counties, and except those listed by name in the Special Regulations.~~	~~All year.~~	~~5 trout~~
(4~~1~~) All anadromous waters except those listed by name in ~~the~~ Section 7.40, Special Regulations (See definition of anadromous waters, Section 1.04).	Closed to all fishing all year.	
~~(5) All streams and tributaries (except those listed by name in the Special Reguilations) above Twitchell Dam on the Cuyama River, above Bradbury Dam and below Gibraltar Dam on the San Ynez River; above Matilja Dam on Matilija Creek and above Wheeler Gorge Campground on NF Matilija Creek; and above Rindge Dam on Malibu Creek.~~	~~All year~~	~~5 trout~~
~~(g) Colorado River District~~		
~~(1) The Colorado River and its back waters~~	~~All year~~	~~10 trout~~
~~(2) All other waters~~	~~All year~~	~~5 trout~~

*Hatchery trout or steelhead have a healed adipose fin clip (adipose fin is absent). Unless otherwise provided, all other trout and steelhead must be immediately released. Wild trout or steelhead are those not showing a healed adipose fin clip (adipose fin present).

Note: Authority cited: Sections 200, 205, 265 and 275, Fish and Game Code. Reference: Sections 110, 200, and 205, Fish and Game Code.

Proposed Regulatory Language

Section 7.40, Title 14, CCR, is added to read:

§ 7.40. Alphabetical List of Hatchery Trout, Hatchery Steelhead, and Salmon Waters with Special Fishing Regulations.

(a) General Provisions:

(1) Every body of water listed ~~below~~in subsection (b) is closed to the take of hatchery trout, hatchery steelhead, and salmon and to fishing for these species, unless otherwise noted.

(2) Unless otherwise provided, waters shown as open to hatchery trout, hatchery steelhead, and salmon fishing ~~below~~in subsection (b), are open to fishing for other species. Every body of water listed ~~below~~in subsection (b) is closed to all fishing except during the open season as shown. Gear restrictions listed in this section apply to the take of all species of fish cover in subsection (b) unless otherwise noted.

(3) Unless otherwise provided, waters closed to hatchery trout, hatchery steelhead, or salmon fishing are closed to fishing for all other species, except that these closures do not apply to fishing for amphibians (see Section 5.05), freshwater clams (see Section 5.20), crayfish (see Section 5.35), and lamprey (see Section 5.40), using legal fishing methods other than hook-and-line fishing, and saltwater clams, crabs, ghost shrimp, and blue mud shrimp (see Ocean Regulations Booklet Sections 29.20 to 29.87). Crabs may only be taken using hoop nets or by hand, and Dungeness crab may only be taken within the North Coast District and Sonoma and Mendocino Cos.~~counties~~.

(4) As used in this section, daily bag and possession limits, unless otherwise noted, mean the total number of trout in combination, including but not limited to rainbow, brown, golden, and cutthroat.

(5) Unless otherwise provided, it is unlawful to possess more than one daily bag limit.

(6) The~~se~~ waters in subsection (b) may also be subject to restrictions on fishing methods and gear (sections 2.00 through 2.45~~0~~), fishing hours (section 3.00), and the use of bait (sections 4.00 through 4.30).

(b)

Body of Water	***Open Season and Special Restrictions***	***Daily Bag and Possession Limit***
(1) Alameda Creek and tributaries (Alameda and Santa Clara Cos.~~cos.~~).		
(A) Alameda Creek and tributaries downstream of San Antonio, Calaveras, and Del Valle Reservoirs except for Arroyo Del Valle between Bernal Ave. and the Thiessen St. intersection with Vineyard Ave.	Closed to all fishing all year.	
1. Arroyo Del Valle between Bernal Ave. and the Thiessen St. intersection with Vineyard Ave.	All year. Only artificial lures with barbless hooks may be used.	0 trout
(2) Albion River (Mendocino Co.). Also see Subsection 8.00(b) Low-Flow Restrictions. Main stem below the confluence of South Fork Albion.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(3) Alder Creek (Mendocino Co.). Also see Subsection 8.00(b) Low-	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with	2 hatchery trout or hatchery steelhead**. 4

Flow Restrictions. Main stem below Tramway Gulch.	barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	hatchery trout or hatchery steelhead** in possession.
(4) American River (Sacramento Co.).		
(A) From Nimbus Dam to the U.S. Geological Survey gauging station cable crossing about 300 yards downstream from the Nimbus Hatchery fish rack site.	Closed to all fishing all year.	
(B) From the U.S. Geological Survey gauging station cable crossing about 300 yards down-stream from the Nimbus Hatchery fish rack site to the SMUD power line crossing at the southwest boundary of Ancil Hoffman Park.	Jan. 1 through Jul.~~y~~ 15. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead** 4 hatchery trout or. hatchery steelhead** in possession.
	Jul.~~y~~ 16 through Oct. 31. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 Chinook Salmon. 4 Chinook Salmon in possession.
	Jan. 1 through Jul.~~y~~ 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
	Jul.~~y~~ 16 through Dec. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 Chinook Salmon. 4 Chinook Salmon in possession.
(C) From the SMUD power line crossing at the southwest boundary of Ancil Hoffman Park down- stream to the Jibboom Street bridge. (D) From the Jibboom Street bridge to the mouth.	Jan. 1 through Jul.~~y~~ 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
	Jul.~~y~~ 16 through Dec. 16.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 Chinook

		Salmon. 4 Chinook Salmon in possession.
	Dec. 17 through Dec. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(5) Antelope Creek (Tehama Co.).		
(A) From confluence with North Fork downstream to U.S. Geological Survey gauging station cable crossing at mouth of Antelope Creek Canyon.	Last Sat.~~urday~~ in Apr.~~il~~ through Nov. 15. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(5) Antelope Creek (Tehama Co.).	Jun.~~e~~ 16 through Sep.~~tember~~ 30.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(A) From confluence with North Fork downstream to U.S. Geological Survey gauging station cable crossing at mouth of Antelope Creek Canyon.	Dec. 1 through Mar. 7, but only on Sat., Sun. ,Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(5) Antelope Creek (Tehama Co.).	Closed to all fishing all year.	
(A) From confluence with North Fork downstream to U.S. Geological Survey gauging station cable crossing at mouth of Antelope Creek Canyon.	Closed to all fishing all year.	
(B) From U.S. Geological Survey gauging station cable crossing at mouth of Antelope Creek Canyon downstream to mouth of Antelope Creek.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(6) Aptos Creek (Santa Cruz Co.) from mouth to bridge on Aptos Creek Road. Also see Low-Flow Restrictions, Subsection 8.00(c)(4).	Fourth Sat.~~urday~~ in May through Oct. 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(7) Arroyo Grande Creek (San Luis Obispo Co.)~~.~~ F from mouth to Lopez Canyon Dam.		
(8) Arroyo Leon (San Mateo Co.).	Closed to all fishing all year.	
(9) Arroyo Seco River (Monterey Co.). Also see Subsection 8.00(c) Low-Flow Restrictions. The main stem Arroyo Seco and tributaries below the waterfall located approximately 3.5 miles upstream	Last Sat.~~urday~~ in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

from the U.S. Forest Service Ranger Station.		
(10) Auburn Ravine Creek and tributaries (Placer Co.) east of Nelson Lane.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(11) Battle Creek (Shasta and Tehama Cos.).	Fourth Sat.~~urday~~ in May through Oct. 15.	2 hatchery trout or hatchery steelhead**, 4 hatchery trout or hatchery steelhead** in possession.
(A) From mouth to Coleman Fish Hatchery weir.		
(B) From 250 feet upstream from the Coleman National Fish Hatchery upstream to Angel Falls (near Mineral) on the South Fork and to Ponderosa Way Bridge on the North Fork.	Jun.~~e~~ 16 through Feb. 15. Only artificial lures with barbless hooks may be used from Oct. 16 through Feb. 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(12) Bear River (Humboldt Co.) downstream from County Road Bridge at Capetown, excluding tributaries.	Nov. 1 through Apr.~~il~~ 30. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(13) Bear River and tributaries (Placer Co.) From Highway 65 to the South Sutter Irrigation District Diversion Dam.	Closed to all fishing all year.	
(14) Big Chico Creek (Butte Co.).	All year. Only barbless hooks may be used. Cutthroat trout minimum size limit: 10 inches.	2 cutthroat trout. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(A) From mouth to Bear Hole, located approximately one mile downstream from the upper end of Bidwell Park.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From Bear Hole to the upper boundary of the Big Chico Creek Ecological Reserve.	Closed to all fishing all year.	
(C) From the upper boundary of the Big Chico Creek Ecological Reserve to Higgins Hole Falls, located about one-half mile upstream from Ponderosa Way.	Closed to all fishing all year.	

(15) Big Lagoon (Humboldt Co.). For purposes of this ~~regulations~~section, the boundary between Big Lagoon and Maple Creek is the first private road bridge, located approximately 1/2 mile southeast of the Highway 101 bridge crossing.	Closed to all fishing all year.	
(16) Big River (Mendocino Co.). Also see Subsection 8.00(b) Low-Flow Restrictions. Main stem below the confluence of Two Log Creek.	See Klamath River 7.40(b)(50).	
(17) Big Sur River (Monterey Co.). Big Sur river within Pfeiffer Big Sur State Park, east of the Highway 1 bridge, to its boundary within the Ventana Wilderness Area.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(18) Black Butte River and tributaries (Glenn Co.) except Cold Creek.		
(19) Bodfish Creek and tributaries (Santa Clara Co.)	Dec. 1 through Mar. 7, but only on Sat., Sun.,Wed.,legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(20) Bogus Creek (Siskiyou Co.).		
(21) Brush Creek (Mendocino Co.). Main stem below the Lawson bridge. Also see Subsection 8.00(c) Low-Flow Restrictions.	Nov.~~ember~~ 15 through Feb.~~ruary~~ 15. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(22) Butano Creek (San Mateo Co.).	All year.	Open to fishing for non-salmonids only. Closed to the take of trout, and steelhead.
From mouth to county bridge on Pescadero-Bean Hollow Road. Also see ~~Low- Flow Restrictions,~~ Subsection 8.00(c)(2) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(23) Butte Creek (Butte and Sutter Cos.).	Last Sat.~~urday~~ in Apr. through Nov. 15. No rainbow trout less than 10 inches or greater than 16 inches total length may be kept. Only artificial lures with barbless hooks may be used.	5 trout, no more than 2 of which may be rainbow trout.
(A) From the Oro-Chico Road bridge crossing south of Chico to the		

Centerville Head Dam, located 300 yards downstream from the DeSabla Powerhouse below DeSabla Reservoir.		
(B) From the Oro-Chico Road bridge crossing south of Chico to the point that Butte Creek enters the Sacramento River both via Butte Slough outfall gates at Moon's Bend and through Butte Slough, thence both the East and West Canals of the Sutter Bypass, thence Sacramento Slough.	Closed to all fishing all year.	
(24) Calaveras River downstream from New Hogan Dam and the diverting canal (Mormon Slough) from Bellota Weir downstream to Interstate Highway 5 (Calaveras and San Joaquin Cos.~~cos.~~).	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., and opening and closing days. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(25) Carmel River and tributaries above Los Padres Dam (Monterey Co.).	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(26) Carmel River below Los Padres Dam. (Monterey Co.)	Closed to all fishing all year.	
(A) Carmel River tributaries below Los Padres Dam and main stem from Los Padres Dam to the bridge at Robles Del Rio/Esquiline roads (Rosie's Bridge).	Fourth Sat.~~urday~~ in May through Oct. 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) Carmel River main stem below the bridge at Robles Del Rio/Esquiline roads (Rosie's Bridge). Also see Subsection 8.00(c) Low-Flow Restrictions.	Closed to all fishing all year.	
(27) Chorro Creek (San Luis Obispo Co.) from the point that Chorro Creek enters Midway Marina in Morro Bay upstream to the twin bridges on South Bay Boulevard.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(28) Codornices Creek (Alameda Co.).	Jan. 1 through Oct. 15. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(29) Coon Creek and tributaries (Placer Co.) east of Highway 65.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or

	through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	hatchery steelhead** in possession.
(30) Coon Creek (San Luis Obispo Co.)	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15. Only artificial lures and barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(31) Corralitos Creek (Santa Cruz Co.) from mouth to Browns Valley Road. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(5) Low-Flow Restrictions.		
(32) Cosumnes River (Sacramento Co.) from Highway 99 bridge upstream to the Latrobe vehicle bridge.	Last Sat.~~urday~~ in Apr.~~il~~ through Nov. 15. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(33) Cottoneva Creek (Mendocino Co.). Main stem below the confluence of South Fork Cottoneva Creek. Also see Subsection 8.00(b) Low-Flow Restrictions.	Jun.~~e~~ 16 through Sept. 30.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(34) Coyote Creek (Santa Clara Co.) Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(1) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Oct. 15. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(35) Deer Creek (Tehama Co.).	Fourth Sat.~~urday~~ in May through Oct. 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(A) From 250 feet below Upper Deer Creek Falls and fishway (located 1.5 miles upstream from Potato Patch Campground) downstream 31 miles to U.S. Geological Survey gauging station cable crossing at mouth of Deer Creek Canyon (see Section 2.35 for closure at Upper Deer Creek Falls).	Fourth Sat.~~urday~~ in May through Oct. 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From U.S. Geological Survey gauging station cable crossing at mouth of Deer Creek Canyon downstream to mouth of Deer Creek.	All year. Only barbless hooks may be used. Cutthroat trout minimum size limit: 10 inches.	2 cutthroat trout. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

(36) Deer Creek (Yuba and Nevada Cos.) from mouth to Smartville-Englebright Dam road crossing.	~~Low-Flow Restrictions,~~ Section 8.00 Low-Flow Restrictions, also apply~~, see below for more detail.~~	
(37) Dry Creek and tributaries (Placer Co.) east of the Atkinson Street Bridge in Roseville.		
(38) Dry Creek (Yuba and Nevada Co.) from mouth to Sid Smith Dam about one mile above junction of Scott Forbes and Peoria roads.		
(39) Earl Lake/Talawa (Del Norte Co.).	All year. Only artificial lures with barbless hooks may be used from Apr.~~il~~ 1 through the Fri.~~day~~ preceding the fourth Sat.~~urday~~ in May. Only barbless hooks may be used from fourth Sat.~~urday~~ in May through Mar. 31.	Catch and Release of Chinook Salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(40) Eel River (Humboldt, Lake, Mendocino and Trinity Cos.~~cos.~~).	All year. Only artificial lures with barbless hooks may be used from Apr. 1 through Sept. 30. Only barbless hooks may be used from Oct. 1 through Mar. 31.	Catch and Release of Chinook Salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(41) All waters of the Eel River Drainage except those listed below are closed to all fishing. (A) Main stem.	Jan. 1 through Mar. 31 and Fourth Sat.~~urday~~ in May through Sept. 30. Only artificial lures with barbless hooks may be used. Apr. 1 through the Fourth Fri.~~day~~ in May and Oct. 1 through Dec. 31.	Catch and Release of Chinook Salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
1. From mouth to Fulmor Road, at its paved junction with the south bank of the Eel River. 2. From Fulmor Road, at its paved junction with the south bank of the Eel River, to South Fork Eel River. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(1) Low-Flow Restrictions.		Closed to all fishing.
1. Main stem from its junction with the Eel River to the end of Golden Gate Drive near Bridgeville (approximately 4,000 feet upstream from the Little Golden Gate Bridge). Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(3) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Sept. 30. Only barbless hooks may be used from Oct. 1 through Mar. 31.	Catch and Release of Chinook salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

3. From South Fork Eel River to Cape Horn Dam.	Apr. 1 to Fourth Fri.~~day~~ in May. Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Sept. 30. Only barbless hooks may be used from Oct. 1 through Mar. 31. Apr. 1 to Fourth Fri.~~day~~ in May.	Closed to all fishing Catch and Release of Chinook salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. Closed to all fishing
1. Main stem from its junction with the Eel River to the end of Golden Gate Drive near Bridgeville (approximately 4,000 feet upstream from the Little Golden Gate Bridge). Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(3) Low-Flow Restrictions.		
(B) Van Duzen River. 1. Main stem from its junction with the Eel River to the end of Golden Gate Drive near Bridgeville (approximately 4,000 feet upstream from the Little Golden Gate Bridge). Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(3) Low-Flow Restrictions.	Jan. 1 through May 31 and Jul.~~y~~ 16 through Sept. 30. At all times, only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
	Jun. 1 through Jul.~~y~~ 15 and Oct. through Dec. 31.	Closed to all fishing
(C) South Fork Eel River from mouth to Rattlesnake Creek. Also see Low-Flow Restrictions, Subsection 8.00(a)(2). (D) Middle Fork Eel River.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(42) Elk River (Humboldt Co.) downstream from Highway 101 bridge, excluding tributaries.	Nov. 1 through Mar. 31. Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Oct. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or 4 hatchery steelhead** in possession.
1. Middle Fork main stem from mouth to Bar Creek. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(2) Low-Flow Restrictions.		
(42) Elk River (Humboldt Co.) downstream from Highway 101 bridge, excluding tributaries.	Closed to all fishing all year.	
(41) Elk Creek (Mendocino Co.). Also see Subsection 8.00(b) Low-	Jan. 1 through Jul.~~y~~ 15. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4

Flow Restrictions. Main stem below the confluence of South Fork Elk Creek.		hatchery trout or hatchery steelhead** in possession.
(42) Elk River (Humboldt Co.) downstream from Highway 101 bridge, excluding tributaries.	All year.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout orhatchery steelhead** in possession.
(43) Feather River below Fish Barrier Dam (Butte, Sutter and Yuba Cos.~~cos.~~). (A) From Fish Barrier Dam to Table Mountain bicycle bridge in Oroville.	Jan. 1 through Jul.~~y~~ 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From Table Mountain bicycle bridge to Highway 70 bridge. (C) From Highway 70 bridge to the unimproved boat ramp above the Thermalito Afterbay Outfall. (D) From the unimproved boat ramp above the Thermalito Afterbay Outfall to 200 yards above the Live Oak boat ramp.	Jul.~~y~~ 16 through Oct. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 3 Chinook Salmon. 6 Chinook Salmon in possession.
	Nov. 1 through Dec. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(E) From 200 yards above Live Oak boat ramp to the mouth. For purposes of this regulation, the lower boundary is defined as a straight line drawn from the peninsula point on the west bank to the Verona Marine boat ramp.	Jan. 1 through Jul.~~y~~ 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(E) From 200 yards above Live Oak boat ramp to the mouth. For purposes of this regulation, the lower boundary is defined as a straight line drawn from the peninsula point on the west bank to the Verona Marine boat ramp.	Jul.~~y~~ 16 through Dec. 16.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 3 Chinook Salmon. 6 Chinook Salmon in possession.
(E) From 200 yards above Live Oak boat ramp to the mouth. For purposes of this regulation, the lower boundary is defined as a straight line drawn from the peninsula point on the west bank to the Verona Marine boat ramp. (E) From 200 yards above Live Oak boat ramp to the mouth. For purposes of this regulation, the lower boundary is defined as a	Dec. 17 to Dec. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

straight line drawn from the peninsula point on the west bank to the Verona Marine boat ramp.		
(44) Freshwater Creek (Humboldt Co.) downstream from bridge at “3 Corners” on the Old Arcata Road, excluding tributaries.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(45) Garcia River (Mendocino Co.). Also see Subsection 8.00(b) Low-Flow Restrictions. Main stem below the Eureka Hill Road bridge.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(44) Freshwater Creek (Humboldt Co.) downstream from bridge at “3 Corners” on the Old Arcata Road, excluding tributaries.		
(45) Garcia River (Mendocino Co.). Also see Subsection 8.00(b) Low-Flow Restrictions. Main stem below the Eureka Hill Road bridge.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(44) Freshwater Creek (Humboldt Co.) downstream from bridge at “3 Corners” on the Old Arcata Road, excluding tributaries.	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15. Only artificial lures and barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(45) Garcia River (Mendocino Co.). Also see Subsection 8.00(b) Low-Flow Restrictions. Main stem below the Eureka Hill Road bridge.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31. Fishing from a flotation device is prohibited from Nov. 15 through Feb. 28 from the confluence of the North Fork to the Highway 1 bridge.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(46) Greenwood Creek (Mendocino Co.). Also see Subsection 8.00(b) Low-Flow Restrictions.	Closed to all fishing all year.	
Main stem below the log bridge about 1 1/2 miles east of Highway 1.		

(47) Guadalupe River below Guadalupe Reservoir (Santa Clara Co.) including Los Gatos Ck. Below Vasona Lake, and Alamitos Ck. and Arroyo Calero below Calero Reservoir.		
(48) Gualala River (Mendocino and Sonoma Cos.~~cos.~~). Also see Subsection 8.00(b) Low-Flow Restrictions. Main stem below the confluence of Wheatfield and South Forks.		
(49) Islay Creek (San Luis Obispo Co.).		

(50) Klamath River Basin Regulations ~~(See Section 1.74 for salmon punch card requirements)~~. Anadromous Waters of the Klamath River Basin Downstream of Iron Gate and Lewiston dams. T~~he regulations in t~~his subsection applies~~y~~ only to waters of the Klamath River Basin ~~which~~that are accessible to anadromous salmonids. ~~They~~This section does not apply to waters of the Klamath River Basin ~~which~~that are inaccessible to anadromous s~~(91.1)~~almon and trout, portions of the Klamath River system upstream of Iron Gate Dam, portions of the Trinity River system upstream of Lewiston Dam, and the Shasta River and tributaries upstream of Dwinnel Dam. Fishing in these waters is governed by the ~~General Regulations for~~ non-anadromous waters of the ~~North Coast~~ District General Regulations (see Section 7.00, subsection (a)~~(4)~~).

(A) Restrictions and Requirements.

1. Only barbless hooks may be used. (For definitions regarding legal hook types, hook gaps and rigging see Chapter 2, Article 1, Section 2.10.)
2. During closures to the take of adult salmon, it shall be unlawful to remove any adult Chinook Salmon from the water by any means.
3. See Section 1.74 for sport fish report card requirements.

(B) General Area Closures.

1. No fishing is allowed within 750 feet of any ~~D~~department ~~of Fish and Wildlife~~ fish-counting weir.
2. No fishing is allowed from the Ishi Pishi Road bridge upstream to and including Ishi Pishi Falls from Aug.~~ust~~ 15 through Dec.~~ember~~ 31. Exception: members of the Karuk ~~Indian~~ Tribe listed on the current Karuk Tribal Roll may fish at Ishi Pishi Falls using hand-held dip nets.
3. No fishing is allowed from Sep.~~tember~~ 15 through Dec.~~ember~~ 31 in the Klamath River within 500 feet of the mouths of the Salmon, the Shasta and the Scott rivers and Blue Creek.
4. No fishing is allowed from Jun.~~e~~ 15 through Sep.~~tember~~ 14 in the Klamath River from 500 feet above the mouth of Blue Creek to 500 feet downstream of the mouth of Blue Creek.

(C) Klamath River Basin Possession Limits.

1. Trout Possession Limits.
   a. The Brown Trout possession limit is 20.
   b. The hatchery trout or hatchery steelhead possession limits are as follows:
      (i) Klamath River - 4 hatchery trout or hatchery steelhead.
      (ii) Trinity River - 4 hatchery trout or hatchery steelhead.
2. Chinook Salmon Possession Limits.

a. Klamath River downstream of the Highway 96 bridge at Weitchpec from Jan.~~uary~~ 1 to Aug.~~ust~~ 14 and the Trinity River downstream of the Old Lewiston Bridge to the confluence of the South Fork Trinity River from Jan.~~uary~~ 1 to Aug.~~ust~~ 31: 2 Chinook Salmon.

b. Klamath River from Aug.~~ust~~ 15 to Dec.~~ember~~ 31 and Trinity River from Sep.~~tember~~ 1 to Dec.~~ember~~ 31: 6 Chinook Salmon. No more than 3 Chinook Salmon over 23 inches total length may be retained when the take of salmon over 23 inches total length is allowed.

(D) Klamath River Basin Chinook Salmon Quotas.

~~The~~ Klamath River fall-run Chinook Salmon take is regulated using quotas. Accounting of the tribal and non-tribal harvest is closely monitored from Aug.~~ust~~ 15 through Dec.~~ember~~ 31 each year. ~~These q~~Quota areas are noted in subsection (b)(~~91.1~~50)(E) with "Fall Run Quota" in the *Open Season and Special Regulations* column.

1. Quota for Entire Basin.

The 2020 Klamath River Basin quota is 1,296 Klamath River fall-run Chinook Salmon over 23 inches total length. The department shall inform the ~~C~~commission, and the public via the news media, prior to any implementation of restrictions triggered by the quotas. (Note: A department status report on progress toward the quotas for the various river sections is updated weekly, and available ~~at~~by calling 1-800-564-6479.)

2. Subquota Percentages.

a. The subquota for the Klamath River upstream of the Highway 96 bridge at Weitchpec and the Trinity River is 50% of the total Klamath River Basin quota.

(i) The subquota for the Klamath River from 3,500 feet downstream of the Iron Gate Dam to the Highway 96 bridge at Weitchpec is 17% of the total Klamath River Basin quota.

(ii) The subquota for the Trinity River main stem downstream of the Old Lewiston Bridge to the Highway 299 West bridge at Cedar Flat is 16.5% of the total Klamath River Basin quota.

(iii) The subquota for the Trinity River main stem downstream of the Denny Road bridge at Hawkins Bar to the confluence with the Klamath River is 16.5% of the total Klamath River Basin quota.

b. The subquota for the lower Klamath River downstream of the Highway 96 bridge at Weitchpec is 50% of the total Klamath River Basin quota.

(i) The Spit Area (within 100 yards of the channel through the sand spit formed at the Klamath River mouth) will close when 15% of the total Klamath River Basin quota is taken downstream of the Highway 101 bridge.

(E) Klamath River Basin Open Seasons and Bag Limits.

All anadromous waters of the Klamath River Basin are closed to all fishing for all year except those areas listed in the following table. Bag limits are for trout and Chinook Salmon in combination unless otherwise specified.

Body of Water	***Open Season and Special Restrictions***	***Daily Bag Limit***

1. Bogus Creek and tributaries.	Fourth Sat.~~urday~~ in May through Aug.~~ust~~ 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead.**
2. Klamath River main stem from 3,500 feet downstream of Iron Gate Dam to the mouth.		
a. Klamath River from 3,500 feet downstream of the Iron Gate Dam to the Highway 96 bridge at Weitchpec.	Jan.~~uary~~ 1 to Aug.~~ust~~ 14.	0 Chinook Salmon 2 hatchery trout or hatchery steelhead**
	Fall Run Quota 220 Chinook Salmon Aug.~~ust~~ 15 to Dec.~~ember~~ 31, 2020.	2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length. 2 hatchery trout or hatchery steelhead**
	Fall Run Quota Exception: Chinook Salmon over 23 inches total length may be retained from 3,500 feet downstream of Iron Gate Dam to the Interstate 5 bridge when the department determines that the adult fall-run Chinook Salmon spawning escapement at Iron Gate Hatchery exceeds 8,000 fish. Daily bag and possession limits specified for fall-run Chinook Salmon apply during this exception.	
b. Klamath River downstream of the Highway 96 bridge at Weitchpec.	Jan.~~uary~~ 1 to Aug.~~ust~~ 14.	2 Chinook Salmon 2 hatchery trout or hatchery steelhead**
	Fall Run Quota 648 Chinook Salmon Aug.~~ust~~ 15 to Dec.~~ember~~ 31, 2020.	2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length. 2 hatchery trout or hatchery steelhead**
	Fall Run Quota Exception: Spit Area (within 100 yards of the channel through the sand spit formed at the Klamath River mouth). This area will be closed to all fishing after 15% of the Total Klamath River Basin Quota has been taken.	

	All legally caught Chinook Salmon must be retained. Once the adult (greater than 23 inches) component of the total daily bag limit has been retained anglers must cease fishing in the spit area.	
3. Salmon River main stem, main stem of North Fork downstream of Sawyer's Bar bridge, and main stem of South Fork downstream of the confluence of the East Fork of the South Fork.	Nov.~~ember~~ 1 through Feb.~~ruary~~ 28.	2 hatchery trout or hatchery steelhead**
4. Scott River main stem downstream of the Fort Jones-Greenview bridge to the confluence with the Klamath River.	Fourth Sat.~~urday~~ in May through Feb.~~ruary~~ 28.	2 hatchery trout or hatchery steelhead**
5. Shasta River main stem downstream of the Interstate 5 bridge north of Yreka to the confluence with the Klamath River.	Fourth Sat.~~urday~~ in May through Aug.~~ust~~ 31 and Nov.~~ember~~ 16 through Feb.~~ruary~~ 28.	2 hatchery trout or hatchery steelhead**
6. Trinity River and tributaries.		
a. Trinity River main stem from 250 feet downstream of Lewiston Dam to the Old Lewiston Bridge.	Apr.~~il~~ 1 through Sep.~~tember~~ 15. Only artificial flies with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**
b. Trinity River main stem downstream of the Old Lewiston Bridge to the Highway 299 West bridge at Cedar Flat.	Jan.~~uary~~ 1 to Aug.~~ust~~ 31.	2 Chinook Salmon 10 Brown Trout 2 hatchery trout or hatchery steelhead**
	Fall Run Quota 214 Chinook Salmon Sep.~~tember~~ 1 to Dec.~~ember~~ 31, 2020.	2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length. 10 Brown trout 2 hatchery trout or hatchery steelhead**
	Fall Run Quota Exception: Chinook Salmon over 23 inches total length may be retained downstream of the Old Lewiston Bridge to the mouth of Indian Creek when the department determines that the adult fall-run Chinook Salmon spawning escapement at Trinity River Hatchery exceeds 4,800 fish. Daily bag	

	and possession limits specified for fall-run Chinook Salmon apply during this exception.	
c. Trinity River main stem downstream of the Highway 299 West bridge at Cedar Flat to the Denny Road bridge at Hawkins Bar.	Jan.~~uary~~ 1 through Aug.~~ust~~ 31.	2 Chinook Salmon 10 Brown Trout 2 hatchery trout or hatchery steelhead**
	Sep.~~tember~~ 1 through Dec.~~ember~~ 31.	Closed to all fishing.
d. New River main stem downstream of the confluence of the East Fork to the confluence with the Trinity River.	Sep.~~tember~~ 15 through Nov.~~ember~~ 15. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**
e. Trinity River main stem downstream of the Denny Road bridge at Hawkins Bar to the mouth of the South Fork Trinity River.	Jan.~~uary~~ 1 to Aug.~~ust~~ 31.	2 Chinook Salmon 10 Brown Trout 2 hatchery trout or hatchery steelhead**
	Fall Run Quota 214 Chinook Salmon Sep.~~tember~~ 1 through Dec.~~ember~~ 31, 2020. This is the cumulative quota for subsections 6.e. and 6.f. of this table.	2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length. 10 Brown Trout 2 hatchery trout or hatchery steelhead**
f. Trinity River main stem downstream of the mouth of the South Fork Trinity River to the confluence with the Klamath River.	Jan.~~uary~~ 1 to Aug.~~ust~~ 31.	0 Chinook Salmon 10 Brown Trout 2 hatchery trout or hatchery steelhead**
	Fall Run Quota 214 Chinook Salmon Sep.~~tember~~ 1 through Dec.~~ember~~ 31, 2020. This is the cumulative quota for subsections 6.e. and 6.f. of this table.	2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length. 10 Brown Trout 2 hatchery trout or hatchery steelhead**
g. Hayfork Creek main stem downstream of the Highway 3 bridge in Hayfork to the	Nov.~~ember~~ 1 through Mar.~~ch~~ 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**

confluence with the South Fork Trinity River.		
h. South Fork Trinity River downstream of the confluence with the East Fork of the South Fork Trinity River to the South Fork Trinity River bridge at Hyampom.	Nov.~~ember~~ 1 through Mar.~~ch~~ 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**
i. South Fork Trinity River downstream of the South Fork Trinity River bridge at Hyampom to the confluence with the Trinity River.	Nov.~~ember~~ 1 through Mar.~~ch~~ 31.	0 Chinook Salmon. 2 hatchery trout or hatchery steelhead**

(51) Special Order Regarding Take of Chinook Salmon in Anadromous Waters of the Klamath River Basin Downstream of Iron Gate and Lewiston dams.
Notwithstanding subsection (b)(50) of Section 7.40, between Jan.~~uary~~ 1 and Aug.~~ust~~ 14 on the Klamath River and between Jan.~~uary~~ 1 and Aug.~~ust~~ 31 on the Trinity River, and South Fork Trinity River, Chinook Salmon may not be taken or possessed except as authorized on the identified segments of rivers as listed in the following table. All other restrictions apply.

Body of Water	***Open Season and Special Restrictions***	***Daily Bag and Possession Limit***
(A) Klamath River segment identified in subsection 7.40(b)(50)(E)2.b.	Jul.~~y~~ 1 through Aug.~~ust~~ 14	1 Chinook Salmon 2 Chinook Salmon in possession
(B) Trinity River segment identified in subsection 7.40(b)(50)(E)6.b.	Jul.~~y~~ 1 through Aug.~~ust~~ 31	1 Chinook Salmon 2 Chinook Salmon in possession
(C) Trinity River segment identified in subsection 7.40(b)(50)(E)6.c.	Jul.~~y~~ 1 through Aug.~~ust~~ 31	1 Chinook Salmon 2 Chinook Salmon in possession
(D) Trinity River segment identified in subsection 7.40(b)(50)(E)6.e.	Jul.~~y~~ 1 through Aug.~~ust~~ 31	1 Chinook Salmon 2 Chinook Salmon in possession
(52) Laguna de Santa Rosa (Sonoma Co. tributary to Russian River) upstream from Guerneville Road bridge.	Last Sat.~~urday~~ in Apr. through Nov. 15.	Open to fishing for non-salmonids only. Closed to the take of trout, and steelhead.
(53) Lagunitas Creek and tributaries (Marin Co).	Closed to all fishing all year.	
(54) Limekiln Creek and tributaries above Highway 1 (Monterey Co.). Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(9) Low-Flow Restrictions.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(55) Little River (Humboldt Co.) downstream from the County Road bridge at Crannell, excluding tributaries.	Fourth Sat.~~urday~~ in May through Mar. 31. Cutthroat trout minimum size limit: 10 inches total length. Only	2 cutthroat trout 2 hatchery trout or hatchery steelhead**. 4 hatchery

	artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	trout or hatchery steelhead** in possession.
(56) Little Sur River and tributaries above Coast Road (Monterey Co.).	Fourth Sat.~~urday~~ in May through Oct. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
	Nov. 16 through the Fri.~~day~~ preceding the last Sat.~~urday~~ in Apr. Only artificial lures with barbless hooks may be used.	0 trout
(57) Llagas Creek (Santa Clara Co.). Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(5) Low-Flow Restrictions.		
(A) From mouth to Monterey Highway Bridge.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From Monterey Highway Bridge to Chesbro Dam.	Closed to all fishing all year.	
(58) Los Osos Creek (San Luis Obispo Co.).	Closed to all fishing all year.	
(59) Los Padres Reservoir (Monterey Co.).	Last Sat.~~urday~~ in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.	5 ~~b~~Brown ~~t~~Trout, 0 rainbow trout.
(60) Mad River and tributaries (Humboldt Co.).		
(A) Mad River from the mouth to 200 yards upstream.	Jan. 1 through Mar. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) Mad River main stem, from 200 yards above its mouth upstream to the confluence with Cowan Creek, excluding tributaries. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(4) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(C) Mad River main stem, from the confluence with Cowan Creek to the confluence with Deer Creek, excluding tributaries.	Closed to all fishing all year.	

(D) Mad River main stem from the confluence with Deer Creek to Ruth Dam.	Fourth Sat.~~urday~~ in May through Oct. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(61) Mattole River (Humboldt Co.). Also see Subsection 8.00(a) Low-Flow Restrictions.		
(A) Mattole River main stem from the mouth to 200 yards upstream.	Closed to all fishing all year.	
(B) Mattole River main stem from 200 yards upstream of mouth to confluence with Stansberry Creek.	Jan. 1 through Mar. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(C) Mattole River main stem from confluence with Stansberry Creek to confluence with Honeydew Creek.	Jan. 1 through Mar. 31 and Fourth Sat.~~urday~~ in May through Aug. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(62) McDonald Creek (Humboldt Co.).	Closed to fishing all year.	
(63) Merced River (Merced Co.).		
(A) From Crocker-Huffman Dam downstream to the Schaffer bridge on Oakdale Road.	Jan. 1 through Oct. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From the Schaffer bridge on Oakdale Road downstream to the mouth.	Jan. 1 through Oct. 31. Bait may be used from Jan. 1 through Oct. 31. However, from Apr.~~il~~ 1 through the Fri.~~day~~ preceding the fourth Sat.~~urday~~ in May, bait may be used only with single hooks having a gap between 1/2 and 1 inch, or with multiple hooks having a gap between 1/4 and 1/2 inch.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(64) Mill Creek (Tehama Co.).		
(A) From the Lassen National Park boundary downstream to the U.S. Geological Survey gauging station cable crossing at the mouth of Mill Creek Canyon.	Last Sat.~~urday~~ in Apr.~~il~~ through Nov. 15. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From U.S. Geological Survey gauging station cable crossing at mouth of Mill Creek Canyon downstream to the mouth of Mill Creek.	Jun.~~e~~ 16 through Sept. 30.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(65) Mitchell Creek and tributaries (Contra Costa Co.).	Closed to all fishing all year.	

(66) Mokelumne River (San Joaquin Co.).		
(A) From Camanche Dam to Elliot Road.	Jan. 1 through Mar. 31.	1 hatchery trout or hatchery steelhead**
	Fourth Sat.~~urday~~ in in May through Jul.~~y~~ 15.	1 hatchery trout or hatchery steelhead**
	Jul.~~y~~ 16 through Oct. 15.	1 hatchery trout or hatchery steelhead**. 2 Chinook Salmon. 4 Chinook Salmon in possession.
(B) From Elliot Road to the Woodbridge Irrigation District Dam including Lodi Lake.	Jan. 1 through Jul.~~y~~ 15.	1 hatchery trout or hatchery steelhead**
	Jul.~~y~~ 16 through Dec. 31.	1 hatchery trout or hatchery steelhead**. 2 Chinook Salmon. 4 Chinook Salmon in possession.
(C) Between the Woodbridge Irrigation District Dam and the Lower Sacramento Road bridge.	Closed to all fishing all year.	
(D) From the Lower Sacramento Road bridge to the mouth. For purposes of this regulation, this river segment is defined as Mokelumne River and its tributary sloughs downstream of the Lower Sacramento Road bridge and east of Highway 160 and north of Highway 12.	Jan. 1 through Jul.~~y~~ 15.	1 hatchery trout or hatchery steelhead**
	Jul.~~y~~ 16 through Dec. 16.	1 hatchery trout or hatchery steelhead**. 2 Chinook Salmon. 4 Chinook Salmon in possession.
	Dec. 17 through Dec. 31.	1 hatchery trout or hatchery steelhead**
(67) Nacimiento River (Monterey and San Luis Obispo Cos.~~cos.~~)		
Main stem below Nacimiento Dam, downstream to its confluence with the Salinas River.	Sat.~~urday~~ preceding Memorial Day through Oct.~~ober~~ 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(68) Napa River and tributaries (Napa Co.). Also see Subsection 8.00(b) Low-Flow Restrictions.		
(A) Main stem above the Oakville Cross Road Bridge near Yountville and all Napa River tributaries.	Closed to all fishing all year.	
(B) From the Oakville Cross Road Bridge near Yountville to the Trancas Bridge. Note: The Napa River below the Trancas Bridge is tidewater, and is under the regulations for the Ocean and San Francisco Bay District (see Sections 1.53 and 27.00).	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

(69) Navarro River (Mendocino Co.). Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(b)(1) Low-Flow Restrictions. Main stem below the Greenwood Road bridge.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(70) Noyo River (Mendocino Co.). Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(b)(1) Low-Flow Restrictions.		
(A) Noyo River main stem from the mouth to the Georgia-Pacific logging road bridge one mile east of Highway 1.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) Noyo River main stem from the Georgia-Pacific logging road bridge one mile east of Highway 1 to the confluence with the South Fork Noyo River.	Fourth Sat.~~urday~~ in May through Oct. 1. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead** 4 hatchery trout or hatchery steelhead** in possession
(C) Noyo River main stem from the confluence with the South Fork Noyo River to the Sonoma/Mendicino Boy Scout Council Camp.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(71) Pajaro River (Monterey, Santa Clara, Santa Cruz and San Benito Cos.) from mouth to Uvas Creek. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(5) Low-Flow Restrictions.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(72) Upper Penitencia Creek (Santa Clara Co.) a tributary to Coyote Ck. Also see Subsection 8.00(c) Low-Flow Restrictions.	Closed to all fishing all year.	
(73) Pescadero Creek (San Mateo Co.) from mouth to the Stage Road bridge at Pescadero. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(2) Low-Flow Restrictions.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(74) Pescadero Creek tributaries and main stem above the Stage Road	Closed to all fishing all year.	

bridge at Pescadero (Santa Clara and San Mateo Cos.).		
(75) Pinole Creek (Contra Costa Co.) and tributaries.	Closed to all fishing all year.	
(76) Redwood Creek and tidewaters (Marin Co.)	Closed to all fishing all year.	
(77) Redwood Creek (Humboldt Co.). Also see Subsection 8.00(a) Low-Flow Restrictions.		
(A) Redwood Creek main stem, within a radius of 200 yards of its mouth.	Jan. 1 through Mar. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) Redwood Creek main stem, from 200 yards above the mouth to the mouth of Prairie Creek.	Fourth Sat.~~urday~~ in May through Mar. 31. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(C) Redwood Creek main stem, from the mouth of Prairie Creek to the mouth of Bond Creek.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(D) Redwood Creek and tributaries, above the mouth of Bond Creek.	Closed to all fishing all year.	
(78) Russian Gulch and tributaries (Sonoma Co.). Main stem below the confluence of the East Branch. Also see Subsection 8.00(b) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(79) Russian River and tributaries (Sonoma and Mendocino Cos.). Also see Subsection 8.00(b) Low-Flow Restrictions.		
(A) Russian River main stem below the confluence of the East Branch Russian River.	All Year. Only artificial lures with barbless hooks may be used from Apr. 1 through Oct. 31 Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) Russian River main stem above the confluence of the East Branch and all River tributaries. (See Laguna de Santa Rosa 7.40(b)(51) and Santa Rosa Creek 7.40(b)(97) for non-salmonids only.)	Closed to all fishing all year.	
(C) Russian River within 250 feet of the Healdsburg Memorial Dam.	Closed to all fishing all year.	

(80) Sacramento River and tributaries below Keswick Dam (Butte, Colusa, Contra Costa, Glenn, Sacramento, Shasta, Solano, Sutter,Tehama and Yolo Cos.).		
(A) Sacramento River from Keswick Dam to 650 feet below Keswick Dam.	Closed to all fishing all year.	
(B) Sacramento River from 650 feet below Keswick Dam to the Deschutes Road bridge.		
1. Sacramento River from 650 feet below Keswick Dam to the Highway 44 bridge.	Closed to all fishing from Apr. 1 through Jul.~~y~~ 31.	
	Jan. 1 to Mar. 31. Only barbless hooks may be used. Aug. 1 to Dec. 31. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
2. Sacramento River from the Highway 44 bridge to the Deschutes Road bridge.	All year. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(C) Sacramento River from the Deschutes Road bridge to the Red Bluff Diversion Dam.	Jan. 1 through Jul.~~y~~ 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
	Aug. 1 through Dec. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 Chinook Salmon. 4 Chinook Salmon in possession.
(D) Sacramento River from the Red Bluff Diversion Dam to the Hwy 113 bridge near Knights Landing.	Jan. 1 through Jul.~~y~~ 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
	Jul.~~y~~ 16 through Dec. 16.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 Chinook Salmon. 4 Chinook Salmon in possession.

	Dec. 17 through Dec. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(E) Sacramento River from the Hwy 113 bridge near Knights Landing to the Carquinez Bridge (includes Suisun Bay, Grizzly Bay and all tributary sloughs west of Highway 160).	Jan. 1 through Jul.~~y~~ 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
	Jul.~~y~~ 16 through Dec. 16.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 Chinook Salmon. 4 Chinook Salmon in possession.
	Dec. 17 through Dec. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(81) Salinas River and tributaries (Monterey and San Luis Obispo Cos.). Also see Subsection 8.00(c) Low-Flow Restrictions.		
(A) The main stem Salinas River.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) All Salinas River tributaries upstream of Arroyo Seco River confluence (including the San Antonio River below San Antonio Reservoir and Dam, Paso Robles Creek and tributaries, Atascadero Creek, Santa Margarita Creek and tributaries but excluding the Nacimiento River) See 7.40(b)(66).	Last Sat.~~urday~~ in Apr. through Nov. 15. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(82) Salmon Creek and tributaries (Sonoma Co.). Also see Subsection 8.00(b) Low-Flow Restrictions.		
(A) Salmon Creek main stem below Highway 1.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

(B) Salmon Creek main stem above Highway 1 and all Salmon Creek tributaries.	Closed to all fishing all year.	
(83) Salmon River (Siskiyou Co.).	See Klamath River 7.50(b)(50).	
(84) San Benito River and tributaries (San Benito Co.).	Last Sat.~~urday~~ in Apr. through Nov. 15.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(85) San Clemente Creek and tributaries (Monterey Co.) except for Trout Lake.	Last Sat.~~urday~~ in Apr. through Nov. 15 Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(86) San Diego Creek (Orange Co.). Downstream of the MacArthur Blvd. bridge only.	Sat.~~urday~~ preceding Memorial Day through Nov. 30. Only artificial lures with barbless hooks may be used.	Open to fishing for non-salmonids only. Closed to the take of trout, and steelhead.
(87) San Francisquito Creek and tributaries (Santa Clara and San Mateo Cos.)	Closed to all fishing all year.	
(88) San Gabriel River (Los Angeles and Orange Cos.) Upstream of the Highway 22 bridge to the start of concrete-lined portion of the river channel.	Sat.~~urday~~ preceding Memorial Day through Nov. 30. Only artificial lures with barbless hooks may be used.	Open to fishing for non-salmonids only. Closed to the take of trout, and steelhead.
(89) San Gregorio Creek (San Mateo Co.) from the mouth to the Stage Road bridge at San Gregorio. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(2) Low-Flow Restrictions.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(90) San Joaquin River (Fresno, Madera, Merced, San Joaquin, and Stanislaus Cos.).		
(A) From Friant Dam downstream to the Highway 140 bridge.	All year.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From the Highway 140 bridge downstream to the Interstate 5 bridge at Mossdale.	All year.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(91) San Juan Creek main stem (Orange Co.).	Closed to all fishing all year.	
(92) San Lorenzo River (Santa Cruz Co.) from the mouth to the Lomond Street bridge in the town of Boulder Creek. Also see Subsection 8.00(c) Low-Flow Restrictions.	Dec. 1 through Mar. 7, but only on Sat., Sun.,Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

(93) San Luis Obispo Creek (San Luis Obispo Co.) from mouth to the first and most southwestern highway 1/101 bridge.	Dec. 1 through Mar. 7, but only Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(94) San Luis Rey River (San Diego Co.).	Closed to all fishing all year.	
(95) San Mateo Creek and tributaries downstream from the falls between the Tenaja Road crossing and Fisherman's Camp (San Diego and Riverside Cos.~~cos.~~).	Closed to all fishing all year.	
(96) San Simeon Creek (San Luis Obispo Co.) from mouth to the pedestrian bridge in San Simeon Beach State Park.	Dec. 1 through Mar. 7, but only Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(97) Santa Margarita River and tributaries downstream from the Interstate 15 bridge (San Diego and Riverside Cos.~~cos.~~).	Closed to all fishing all year.	
(98) Santa Rosa Creek (Sonoma Co. tributary to Russian River) from Laguna de Santa Rosa to Highway 12 bridge.	Last Sat.~~urday~~ in Apr. through Nov. 15.	Open to fishing for non-salmonids only. Closed to the take of trout, and steelhead.
(99) Santa Ynez River and tributaries downstream from Bradbury Dam (Santa Barbara Co.).	Closed to all fishing all year.	
(100) Scott Creek (Santa Cruz Co.) from mouth to confluence with Big Creek. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(3) Low-Flow Restrictions.	Dec. 1 through Mar. 7, but only Sat., Sun.,Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	0 trout
(101) Scott River (Siskiyou Co.).	See Klamath River 7.40(b)(50).	
(102) See Canyon Creek (San Luis Obispo Co.).	Closed to all fishing all year.	
(103) Shasta River (Siskyou Co.).	See Klamath River 7.40(b)(50).	
(104) Sisquoc River and tributaries (Santa Barbara Co.).	Closed to all fishing all year.	
(105) Smith River (Del Norte Co.) Yearly limits apply for entire river.	~~Low-Flow Restrictions,~~ Section 8.00 Low-Flow Restrictions, also apply~~, see below for more detail~~.	
(A) Main stem from the mouth to confluence of Middle and South forks. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(7) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Apr. 30. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Aug.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 cutthroat trout minimum

	31. Only barbless hooks may be used from Sep. 1 through Apr. 30.	size limit: 10 inches total length. 1 Chinook Salmon and no more than 5 wild Chinook Salmon* over 22 inches per year.
(B) Middle Fork Smith River		
1. from mouth to Patrick Creek Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(7) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Apr. 30. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Aug. 31. Only barbless hooks may be used from Sep. 1 through Apr. 30.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 Cutthroat Trout minimum size limit: 10 inches total length. 1 Chinook Salmon and no more than 5 wild Chinook Salmon* over 22 inches per year.
2. above the mouth of Patrick Creek. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(7) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Oct. 31. Only artificial lures with barbless hooks may be used.	2 cutthroat trout minimum size limit: 10 inches total length. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(C) South Fork Smith River		
1. from the mouth upstream approximately 1,000 feet to the County Road (George Tryon) bridge and Craigs Creek to Jones Creek. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(7) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Apr. 30. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Aug. 31. Only barbless hooks may be used from Sep. 1 through Apr. 30.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 Cutthroat Trout minimum size limit: 10 inches total length. 1 Chinook Salmon and no more than 5 wild Chinook Salmon* over 22 inches per year.
2. from the George Tryon bridge upstream to the mouth of Craigs Creek. Also see ~~Low-Flow Restrictons,~~ Subsection 8.00(a)(7) Low-Flow Restrictions.	Closed to fishing all year.	
3. above the mouth of Jones Creek. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(7) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Oct. 31. Only artificial lures with barbless hooks may be used.	2 cutthroat trout minimum size limit: 10 inches total length. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(D) North Fork Smith River.		
1. from the mouth to Stony Creek. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(a)(7) Low-Flow Restrictions.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Aug.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 cutthroat trout minimum

	31. Only barbless hooks may be used from Sep. 1 through Mar. 31.	size limit: 10 inches total length. 1 Chinook salmon and no more than 5 wild Chinook salmon* over 22 inches per year.
2. above the mouth of Stony Creek.	Fourth Sat.~~urday~~ in May through Oct. 31. Only artificial lures with barbless hooks may be used.	2 cutthroat trout minimum size limit: 10 inches total length. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(106) Sonoma Creek and tributaries (Sonoma Co.).		
Sonoma Creek and tributaries between the Sonoma Creek seasonal waterfall in Sugarloaf Ridge State Park (located 0.2 miles upstream of the west end of the Canyon Trail) and the Highway 121 bridge. Note: Sonoma Creek below the Highway 121 Bridge is tidewater, and is regulated by regulations for the Ocean and San Francisco Bay District (see sections 1.53 and 27.00).	Closed to all fishing year.	
(107) Soquel Creek (Santa Cruz Co.) from mouth to confluence of East and West branch. Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(4) Low-Flow Restrictions.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks maybe used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(108) Stanislaus River		
(A) From Goodwin Dam down-stream to the Highway 120 bridge in Oakdale.	Jan. 1 through Oct. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From the Highway 120 bridge in Oakdale to the mouth.	Jan. 1 through Oct. 31. Bait may be used from Jan. 1 through Oct. 31. However, from Apr.~~il~~ 1 through the Fri.~~day~~ preceding the fourth Sat.~~urday~~ in May, bait may be used only with single hooks having a gap between 1/2 and 1 inch, or with multiple hooks having a gap between 1/4 and 1/2 inch.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(109) Stevens Creek (Santa Clara Co.) downstream of Stevens Reservoir.	Last Sat.~~urday~~ in Apr.~~il~~ through Nov. 15. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

(110) Stone Lagoon (Humboldt Co.).	All year. Only artificial lures with barbless hooks may be used. Cutthroat trout minimum size limit: 14 inches.	2 cutthroat trout 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(111) Ten Mile River Mendocino Co.). Also see Subsection 8.00(b)(1) Low-Flow Restrictions. Ten Mile River main stem below the confluence with the Ten Mile River North Fork, and the Ten Mile River North Fork below the confluence with Bald Hill Creek.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct 31. Only barbless hooks may be used from Nov. 1 through May 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(112) Topanga Canyon Creek and tributaries (Los Angeles Co.).	Closed to all fishing all year.	
(113) Trabuco Creek (a.k.a. Arroyo Trabuco Creek) (Orange Co.). Downstream of the I-5 bridge to the confluence with San Juan Creek	Closed to all fishing all year.	
(114) Trinity River and tributaries downstream of Lewiston Dam.	See Klamath River 7.40(b)(50).	
(115) Tuolumne River (Stanislaus and Tuolumne Cos.).		
(A) From La Grange Dam downstream to Hickman bridge.	Jan. 1 through Oct. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From Hickman bridge to the mouth.	Jan. 1 through Oct. 31. Bait may be used from Jan. 1 through Oct. 31. However, from Apr.~~il~~ 1 through the Fri.~~day~~ preceding the fourth Sat.~~urday~~ in May, bait may be used only with single hooks having a gap between 1/2 and 1 inch, or with multiple hooks having a gap between 1/4 and 1/2 inch.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(116) Usal Creek and tributaries (Mendocino Co.). Also see Subsection 8.00(b) Low-Flow Restrictions. Usal Creek main stem below the Usal-Shelter Cove Road	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

(117) Uvas or Carnadero Creek (Santa Clara Co.) Also see ~~Low-Flow Restrictions,~~ Subsection 8.00(c)(5) Low-Flow Restrictions.		
(A) From Highway 152 Bridge to Uvas Dam.	Closed to all fishing all year.	
(B) From mouth to Highway 152 Bridge.	Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(118) Van Duzen River (Humboldt Co.).	See Eel River 7.40(b)(40) and Subsection 8.00(a) Low-Flow Restrictions.	
(119) Waddell Creek (Santa Cruz Co.) from mouth to Highway 1 bridge. Also see ~~Low-Flow~~ Restrictions, Subsection 8.00(c)(3) Low-Flow Restrictions.	Dec. 1 through Mar. 7, but only Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(120) Walker Creek and tributaries (Marin Co.) Also see Subsection 8.00(b) Low-Flow Restrictions.		
(A) Walker Creek main stem below Highway 1.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Sat.~~urday~~ in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) Walker Creek main stem above Highway 1 and all Walker Creek tributaries.	Closed to fishing all year.	
(121) Walnut Creek (Contra Costa Co.).		
(A) Upstream of the confluence with Grayson Creek.	Fourth Sat.~~urday~~ in May through Mar. 31. Only artificial lure with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) Downstream of the confluence with Grayson Creek.	All year.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(122) Wildcat Creek and tributaries (Contra Costa Co.).	Closed all year to fishing.	
(123) Yuba River (Yuba and Nevada Cos.) from mouth to Englebright Dam.		

(A) From mouth to the Highway 20 bridge.	All year. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.
(B) From Highway 20 bridge to Englebright Dam.	Dec. 1 through Aug. 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.

* Wild Chinook Salmon are those not showing a healed adipose fin clip and not showing a healed left ventral fin clip.
**Hatchery trout or steelhead in anadromous waters are those showing a healed adipose fin clip (adipose fin is absent). Unless otherwise provided, all other trout and steelhead must be immediately released. Wild trout or steelhead are those not showing a healed adipose fin clip (adipose fin is present).
Note: Authority cited: Sections 200, 205, 265, 270, 315, 316.5 and 399, Fish and Game Code. Reference: Sections 200, 205, 265, 270 and 316.5, Fish and Game Code.

Proposed Regulatory Language

Section 7.50, Title 14, CCR, is amended to read:

§ 7.50. Alphabetical List of Trout Waters with Special Fishing Regulations.
(a) General Provisions:
~~(1) Every body of water listed below is closed to the take of trout and trout fishing, unless otherwise noted.~~
(~~2~~1) Every body of water listed in subsection (b) ~~below~~ is closed to all fishing except during the open season as shown. Unless otherwise provided, waters shown as open to trout fishing in subsection (b) ~~below~~, are open to fishing for other species. ~~Every body of water listed below is closed to all fishing except during the open season as shown.~~ Gear restrictions listed in this section apply to the take of all species of fish unless otherwise noted.
(~~3~~2) Unless otherwise provided, waters closed to trout fishing are closed to fishing for all other species, except that these closures do not apply to fishing for amphibians (see Section 5.05), freshwater clams (see Section 5.20), crayfish (see Section 5.35), and lamprey (see Section 5.40), using legal fishing methods other than hook-and-line fishing, and saltwater clams, crabs, ghost shrimp, and blue mud shrimp (see Ocean Regulations Booklet ~~Sections~~sections 29.20 to 29.87). Crabs may only be taken using hoop nets or by hand, and Dungeness crab may only be taken within the North Coast District and Sonoma and Mendocino Cos.~~counties~~.
(~~4~~3) Daily bag and possession limits, unless otherwise noted, mean the total number of trout.
(~~5~~4) Unless otherwise provided, it is unlawful to possess more than one daily bag limit.
(~~6~~5) These waters may also be subject to restrictions on fishing methods and gear (sections 2.00 through 2.40), fishing hours (~~section~~Section 3.00), and the use of bait (sections 4.00 through 4.30).
(b)

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(1) Alambique Creek (San Mateo Co.).	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	~~5 trout~~0 trout	**F6**
(~~1.5~~2) Alameda Creek and tributaries (Alameda and Santa Clara ~~Cos.~~cos.).			
(A) Alameda Creek mainstem and all tributaries downstream of San Antonio, Calaveras, and Del Valle ~~Reservoirs~~reservoirs except for Arroyo Del Valle between Bernal Ave. and the Thiessen St. intersection with Vineyard Ave.	Closed to all fishing all year.		**J**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
1. Arroyo Del Valle between Bernal Ave. and the Thiessen St. intersection with Vineyard Ave.	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
(B) Alameda Creek tributaries upstream of San Antonio, Calaveras, and Del Valle ~~Reservoirs~~reservoirs.	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	0 trout	**F6**
(C) San Antonio and Calaveras reservoirs.	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
~~(2) Albion River (Mendocino Co.). Also see Section 8.00(b). Main stem below the confluence of South Fork Albion.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(3) Alder Creek (Mendocino Co.). Also see Section 8.00(b). Main stem below Tramway Gulch.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(4~~.~~3) Almanor Lake tributaries (Lassen, Plumas, and Shasta ~~Cos.~~cos.) upstream to the first lake.	Sat.~~urday~~ preceding Memorial Day through ~~Nov. 15~~ Sep.~~tember~~ 30.	5 trout ~~per day 10 trout in possession.~~	**F1**
(4~~.5~~) American River, North Fork, Middle Fork, South Fork and their tributaries above Folsom Lake (Placer, ~~Eldorado~~El Dorado, Amador, and Alpine ~~Cos.~~cos.), except Caples Creek (See Section 7.50(b)(24)).	~~Last Saturday in Apr. through Nov. 15.~~ ~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout ~~per day 10 trout in possession.~~	**F1**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
	Oct.~~ober~~ 1 through the Fri.~~day~~ preceding Memorial Day. Only artificial lures with barbless hook may be used.	0 trout	**I6**
~~(5) American River (Sacramento Co.)~~			
~~(A) From Nimbus Dam to the U.S. Geological Survey gauging station cable crossing about 300 yards downstream from the Nimbus Hatchery fish rack site.~~	~~Closed to all fishing all year.~~		**HSS**
~~(B) From the U.S. Geological Survey gauging station cable crossing about 300 yards down- stream from the Nimbus Hatchery fish rack site to the SMUD power line crossing at the southwest boundary of Ancil Hoffman Park.~~	~~Jan. 1 through July 15. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead** 4 hatchery trout or. hatchery steelhead** in possession.~~	**HSS**
	~~July 16 through Oct. 31. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 1 Chinook Salmon. 2 Chinook Salmon in possession.~~	**HSS**
~~(C) From the SMUD power line crossing at the southwest boundary of Ancil Hoffman Park down-stream to the Jibboom Street bridge.~~	~~Jan. 1 through July 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~July 16 through Dec. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
		~~possession. 1 Chinook Salmon. 2 Chinook Salmon in possession.~~	
~~(D) From the Jibboom Street bridge to the mouth.~~	~~Jan. 1 through July 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~July 16 through Dec. 16.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 1 Chinook Salmon. 2 Chinook Salmon in possession.~~	**HSS**
	~~Dec. 17 through Dec. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(6) Antelope Creek (Tehama Co.).~~			
~~(A) From confluence with North Fork downstream to U.S. Geological Survey gauging station cable crossing at mouth of Antelope Creek Canyon.~~	~~Last Saturday in April through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From U.S. Geological Survey gauging station cable crossing at mouth of Antelope Creek Canyon downstream to mouth of Antelope Creek.~~	~~June 16 through September 30.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~6.~~5) Antelope Lake tributaries (Plumas Co.).	~~Saturday preceding Memorial Day through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout ~~per day. 10 trout in possession.~~	**F1**
~~(7) Applegate River and tributaries (Siskiyou Co.).~~	~~Last Saturday in Apr. through Nov. 15~~	~~5 trout per day. 10 trout in possession.~~	**SR**
~~(8) Aptos Creek (Santa Cruz Co.) from mouth to bridge on Aptos Creek Road. Also see Low-Flow Restrictions, Section 8.00(c)(4).~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun. ,Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(9) Arroyo de los Frijoles above Lake Lucerne (San Mateo Co.).~~	~~Last Saturday in Apr. through Nov. 15.~~	~~5 trout~~	**SR**
~~(10) Arroyo Grande Creek (San Luis Obispo Co.).~~			
~~(A) Above Lopez Reservoir.~~	~~Last Saturday in Apr. through Nov. 15.~~	~~5 trout. 2 salmon.~~	**SR/Del**
~~(B) From mouth to Lopez Canyon Dam.~~	~~Closed to all fishing all year.~~		**HSS**
~~(11) Arroyo Leon (San Mateo Co.).~~	~~Closed to all fishing all year.~~		**HSS**
(6) Arroyo Seco River (Monterey Co.). Also see Subsection 8.00(c) Low-Flow Restrictions. ~~(A)~~ The main stem Arroyo Seco and tributaries above the waterfall located approximately 3.5 miles upstream from the U.S. Forest Service Ranger Station.	~~Last Saturday in Apr. through Nov. 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout	**F1**
~~(B) The main stem Arroyo Seco and tributaries below the waterfall located approximately 3.5 miles upstream from the U.S. Forest Service Ranger Station.~~	~~Dec. 1 through Mar. 7,but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~(12.5) Auburn Ravine Creek and tributaries (Placer Co.) east of Nelson Lane.~~	~~Fourth Saturday in May through Oct. 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(13) Balm of Gilead Creek (Trinity Co.).~~	~~See Eel River 7.50(b)(63).~~		**Del01**
~~(13.5) Bass Lake (Siskiyou Co.).~~	~~Feb. 1 through Sept. 30.~~	~~5 trout~~	**SL**
~~(14) Battle Creek (Shasta and Tehama Cos.).~~			
~~(A) From mouth to Coleman Fish Hatchery weir.~~	~~Closed to all fishing all year.~~		**HSS**
~~(B) From 250 feet upstream from the Coleman National Fish Hatchery upstream to Angel Falls (near Mineral) on the South Fork and to Ponderosa Way Bridge on the North Fork.~~	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~15~~7) Bear Creek and tributaries (Shasta and Siskiyou ~~Cos.~~cos.) between Ponderosa Way bridge and confluence with Fall River.	~~Saturday preceding Memorial Day through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures may be used.	2 trout~~ per day. 10 trout in possession.~~	**F3**
(~~17~~8) Bear Creek (San Bernardino Co.) from Big Bear Dam to confluence of Santa Ana River.	All year. Only artificial lures~~ with barbless hooks~~ may be used.	2 trout	**A3**
~~(18) Bear River (Humboldt Co.) downstream from County Road Bridge at Capetown, excluding tributaries.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~18.5~~9) Bear River and tributaries (Placer Co.)			
~~(A)~~ From Highway 20 south (downstream) 2.5 miles to the abandoned concrete dam (the Boardman Diversion Dam).	~~Last Saturday in Apr. through Nov. 15. Maximum size limit: 14 inches total length.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~.	5 trout	**G1**
~~(B) From Highway 65 to the South Sutter Irrigation District Diversion Dam.~~	~~Fourth Saturday in May through Oct. 15.~~	~~2 hatchery trout or hatchery steelhead**, 4 hatchery trout or hatchery steelhead** in possession,~~	**HSS**
(~~19~~10) Berryessa Lake tributaries (Lake and Napa ~~Cos.~~cos.).	~~Last Saturday in Apr. through Nov. 15~~Last Sat.~~urday~~ in Apr.~~il~~ through Sep.~~tember~~ 30.	~~5 trout~~ 2 trout. 4 trout in possession.	**F2**
~~(19.5) Big Bear Lake tributaries (San Bernardino Co.)~~	~~Saturday preceding Memorial Day through last day of Feb.~~	~~5 trout per day. 10 trout in possession.~~	**SR**
~~(20) Big Chico Creek (Butte Co.).~~			
~~(A) From mouth to Bear Hole, located approximately one mile downstream from the upper end of Bidwell Park~~	~~June 16 through Feb. 15. Only artificial lures with barbless hooks may be used from Oct. 16 through Feb. 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From Bear Hole to the upper boundary of the Big Chico Creek Ecological Reserve~~	~~Nov. 1 through April 30. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(C) From the upper boundary of the Big Chico Creek Ecological Reserve to Higgins Hole Falls,~~	~~Closed to all fishing all year.~~		**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~located about one-half mile upstream from Ponderosa Way.~~			
~~(21) Big Lagoon (Humboldt Co.). For purposes of this regulation, the boundary between Big Lagoon and Maple Creek is the first private road bridge, located approximately 1/2 mile southeast of the Highway 101 bridge crossing.~~	~~All year. Only barbless hooks may be used. Cutthroat trout minimum size limit: 10 inches.~~	~~2 cutthroat trout. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(22) Big River (Mendocino Co.). Also see Section 8.00(b). Main stem below the confluence of Two Log Creek.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(11) Big Sur River (Monterey Co.). ~~(A)~~ Big Sur River and tributaries above the upstream end of the gorge pool at the boundary of Pfeiffer Big Sur State Park within the Ventana Wilderness Area.	~~Fourth Saturday in May through Oct. 31.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	0 trout	**F6**
~~(B) Big Sur river within Pfeiffer Big Sur State Park, east of the Highway 1 bridge, to its boundary within the Ventana Wilderness Area.~~	~~Closed to fishing all year.~~		**HSS**
(~~23.5~~12) Big Tree Creek (Calaveras Co.) within Calaveras Big Trees State Park (upstream of the Highway 4 culvert crossing).	Closed to all fishing all year.		**J**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~24~~13) Big Trees Creek (Tuolumne Co.) upstream from the confluence of Beaver Creek.	Closed to all fishing all year.		**J**
~~(25) Black Butte River and tributaries (Glenn Co.) except Cold Creek.~~	~~Closed to all fishing all year~~		**HSS**
~~(25.3) Bodfish Creek and tributaries (Santa Clara Co.)~~	~~Closed to all fishing all year.~~		**HSS**
(~~25.5~~14) Boggy Creek (Fresno Co.) and tributaries (tributary to Thomas Edison Lake).	~~June 1 through October 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout ~~per day. 10 trout in possession.~~	**F1**
~~(26) Bogus Creek (Siskiyou Co.).~~	~~See Klamath River 7.50(b)(91.1).~~		**HSS**
(15) Boulder Creek (San Diego Co.) upstream of El Capitan Reservoir, and all of its tributaries.	All year. Only artificial lures may be used.	2 trout	**A3**
(~~26.5~~16) Bridgeport Reservoir and tributaries (Mono Co.)~~. All Bridgeport Reservoir tributaries~~ except Swauger Creek~~,~~ from Bridgeport Reservoir upstream to Highway 395, and Swauger Creek~~,~~ from Bridgeport Reservoir upstream to the private property fence line above the Forest Service campground.	~~Last Saturday in April through the Friday preceding Memorial Day and Oct. 1 through Nov. 15. Minimum size limit: 18 inches total length. Only artifical lures with barbless hooks may be used.~~ Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	~~1 trout.~~5 trout	**B1**
	~~Saturday preceding Memorial Day through Sep. 30.~~	~~5 trout per day. 10 trout in possession.~~	**Del02**
~~(27) Brush Creek (Mendocino Co.). Main stem below the Lawson bridge. Also see Section 8.00(c).~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(27.5) Bucks Lake.~~	~~All year.~~	~~5 trout per day. 10 trout in possession. 10 landlocked~~	**SL**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
		~~salmon per day. 20 landlocked salmon in possession.~~	
(~~28~~17) Bucks Lake tributaries (Plumas Co.).	Sat.~~urday~~ preceding Memorial Day through Sept.~~September~~ 30.	~~5 trout per day. 10 trout in possession.~~ 5 trout	**F1**
(~~28.5~~18) Burney Creek (Shasta Co.) from Burney Creek Falls downstream to Lake Britton.	~~Last Saturday in April through Nov. 15.~~ All year. Only artificial lures with barbless hooks may be used.	~~2 trout Maximum size limit: 14 inches total length.~~ 0 trout	**A6**
(~~2~~19) Butano Creek (San Mateo Co.).			
~~(A)~~ Above Butano Falls.	~~Last Saturday in Apr. through Nov. 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	~~5 trout~~0 trout	**F6**
~~(B) From mouth to county bridge on Pescadero-Bean Hollow Road. Also see Low- Flow Restrictions, Section 8.00(c)(2)~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun.,Wed.,legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~30~~20) Butt Creek and Butt Valley Reservoir Powerhouse Outfall (Plumas Co.).			
(A) Butt Creek.	Sat.~~urday~~ preceding Memorial Day through ~~Nov. 15.~~ Sep.~~tember~~ 30.	5 trout ~~per day. 10 trout in possession.~~	**F1**
(B) Butt Valley Reservoir powerhouse outfall, from the powerhouse downstream to a marker adjacent to Ponderosa Flat Campground.	Sat.~~urday~~ preceding Memorial Day through ~~Feb. 28.~~the last day in Feb.~~ruary~~.	2 trout. 4 trout in possession.	**G2**
(~~3~~21) Butt Valley Reservoir (Plumas Co.).	All year.	2 trout. 4 trout in possession.	**A2**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~(32) Butte Creek (Butte and Sutter Cos.).~~			
~~(A) From the Oro-Chico Road bridge crossing south of Chico to the Centerville Head Dam, located 300 yards downstream from the DeSabla Powerhouse below DeSabla Reservoir.~~	~~November 15 through February 15. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From the Oro-Chico Road bridge crossing south of Chico to the point that Butte Creek enters the Sacramento River both via Butte Slough outfall gates at Moon's Bend and through Butte Slough, thence both the East and West Canals of the Sutter Bypass, thence Sacramento Slough.~~	~~All year~~	~~Open to fishing for non-salmonids only. Closed to the take of trout, and steelhead.~~	**HSS**
(~~33~~22) By-Day Creek and tributaries (Mono Co.).	Closed to all fishing all year.		**J**
(~~34~~23) Cache Creek and tributaries (Lake Co.).	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout	**F1**
~~(35) Calaveras River downstream from New Hogan Dam and the diverting canal (Mormon Slough) from Bellota Weir downstream to Interstate Highway 5 (Calaveras and San Joaquin cos.).~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(35.5) Calleguas Creek and tributaries (Ventura Co.).~~	~~Saturday preceding Memorial Day through November 30. Only artificial lures with barbless hooks may be used.~~	~~Open to fishing for non-salmonids only. Closed to the take of trout and steelhead~~	**SR**
~~(35.6) Canyon Creek upstream of the falls~~	~~Last Saturday in April through November 15.~~	~~2 trout~~	**SR**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~located about four miles north of the wilderness area boundary. (Trinity Co.)~~			
(24) Caples Creek from the confluence with the Silver Fork American River upstream to Caples Lake Dam (El Dorado and Alpine cos.)	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
~~(35.7) Caribou Reservoir (Plumas County)~~	~~Last Saturday in Apr. through Nov. 15~~	~~2 trout~~	**SL**
~~(36) Carmel River and tributaries above Los Padres Dam (Monterey Co.).~~	~~Last Saturday in Apr. through Nov. 15. No rainbow trout less than 10 inches or greater than 16 inches total length may be kept. Only artificial lures with barbless hooks may be used.~~	~~5 trout, no more than 2 of which may be rainbow trout.~~ .	**HSS**
~~(37) Carmel River below Los Padres Dam. (Monterey Co.)~~			
~~(A) Carmel River tributaries below Los Padres Dam and main stem from Los Padres Dam to the bridge at Robles Del Rio/Esquiline roads (Rosie's Bridge).~~	~~Closed to all fishing all year.~~		**HSS**
~~(B) Carmel River main stem below the bridge at Robles Del Rio/Esquiline roads (Rosie's Bridge). Also see Section 8.00(c).~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., and opening and closing days. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~38~~25) Carson River, East Fork and tributaries (Alpine Co.).			
(A) Carson River, East Fork and tributaries above Carson Falls.	Closed to all fishing all year.		**J**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(B) Carson River, East Fork from Hangman's Bridge downstream to Nevada State Line.	All year. ~~Only artificial lures with barbless hooks may be used.~~ Only artificial lures may be used. Minimum size limit: 14 inches total length.	~~0 trout~~2 trout	**A4**
~~(39.3) Castle Creek (Shasta Co.)~~	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	**Del03**
(~~39.5~~26) ~~Ceder~~ Cedar Creek and tributaries upstream from Moon Lake access road (Lassen Co.).	~~Closed to all fishing all year~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures may be used.	2 trout	**G3**
~~(40) Chorro Creek (San Luis Obispo Co.) from the point that Chorro Creek enters Midway Marina in Morro Bay upstream to the twin bridges on South Bay Boulevard.~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~42~~27) Clear Lake tributaries (Lake Co.).	~~Last Saturday in Apr. through Nov. 15~~ All year. Only artificial lures with barbless hooks may be used.	~~5 trout~~ 0 trout	**A6**
~~(42.3) Codornices Creek (Alameda Co.).~~	~~Closed to all fishing all year~~		**HSS**
(~~42.5~~28) Cold Creek (Fresno Co.) and tributaries (tributary to Thomas Edison Lake).	~~June 1 through October 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout ~~per day. 10 trout in possession.~~	**F1**
(~~43~~29) Convict Creek (Mono Co.).			
(A) Convict Creek, including side channels and meanders, in the U.C. study area as posted. This area begins about 1/2 mile above the Highway 395 bridge and extends upstream about 1/2 mile.	Closed to all fishing all year.		**J**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(B) Convict Creek downstream of the U.C. study area.	~~Last Saturday in April through the Friday preceding Memorial Day and Oct. 1 through Nov. 15. Minimum size limit: 18 inches total length. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	~~2 trout~~ 5 trout	**F1**
	~~Saturday preceding Memorial Day through Sept. 30~~	~~5 per day 10 in possession.~~	**Del04**
~~(C) Convict Creek upstream of the U.C. study area.~~	~~Last Saturday in April through Nov. 15.~~	~~5 trout per day. 10 trout in possession~~	**SR**
(30) Convict Lake (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
~~(43.5) Coon Creek and tributaries (Placer Co.) east of Highway 65.~~	~~Fourth Saturday in May through Oct. 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(43.6) Coon Creek (San Luis Obispo Co.)~~	~~Closed to all fishing all year.~~		**HSS**
(44~~3~~1) Corral Valley Creek and tributaries (Alpine Co.).	Closed to all fishing all year.		**J**
~~(45) Corralitos Creek (Santa Cruz Co.) from mouth to Browns Valley Road. Also see Low-Flow Restrictions, Section 8.00(c)(5).~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(46) Cosumnes River (Sacramento Co.) from Highway 99 bridge upstream to the Latrobe vehicle bridge.~~	~~Jan. 1 through Oct. 15. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
		~~steelhead** in possession.~~	
~~(47) Cottoneva Creek (Mendocino Co.). Main stem below the confluence of South Fork Cottoneva Creek. Also see Section 8.00(b).~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~48~~32) Cottonwood Creek and all tributaries upstream from the confluence of the main stem Cottonwood Creek and Little Cottonwood Creek, including the unnamed tributaries flowing through Horseshoe Meadow (Inyo Co.).	All year. Only artificial lures may be used.	2 trout	**A3**
~~(A) Cottonwood Creek main stem between mouth of Little Cottonwood Creek and South Fork of Cottonwood Creek.~~	~~July 1 through Nov. 15. Only artificial lures with barbless hooks may be used~~	~~0 trout~~	**Del05**
~~(B) Cottonwood Creek~~ and ~~(1) and tributaries upstream from the confluence of South Fork,~~	~~July 1 through Nov. 15. Only artificial lures with barbless hooks may be used~~	~~5 trout~~	**Del05**
~~(2) Little Cottonwood Creek and tributaries,~~		~~Wolf Creek~~	**Del05**
~~(3) the South Fork of Cottonwood Creek and tributaries, and~~			**Del05**
~~(4) the unnamed tributary flowing through Horseshoe Meadow.~~			**Del05**
(~~49~~33) Cottonwood Creek drainage lakes (Inyo Co.).			**Del33**
(A) Cottonwood Lakes 1, 2, 3 and 4 and their tributaries (Inyo Co.).	~~July 1 through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~2 trout	**H4**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
	Sep.~~tember~~ 1 through Nov.~~ember~~ 30. Only artificial lures may be used. Minimum size limit: 14 inches total length.		
(B) All remaining Cottonwood Creek drainage lakes.	~~July 1 through Nov. 15. Only artificial lures with barbless hooks may be used~~ All year. Only artificial lures may be used.	~~5 trout~~2 trout	**A3**
~~(49.5) Cottonwood Creek and tributaries (Modoc Co.).~~	~~Saturday preceding Memorial Day through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	**Del06**
(~~50~~34) Cottonwood Creek, North Fork and tributaries (White Mountains, Mono Co.).	Closed to all fishing all year.		**J**
(~~50.5~~35) Cow Creek and tributaries upstream from Forest Service Road 9S10 (Fresno Co.).	Closed to all fishing all year.		**J**
~~(50.8) Coyote Creek (Santa Clara Co.) Also see Low-Flow Restrictions, Section 8.00(c)(1).~~	~~Last Saturday in April through November 15. Only artificial lures and barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~51~~36) Coyote Valley Creek and tributaries (Alpine Co.).	Closed to all fishing all year.		**J**
(~~52~~37) Crooked Creek (Mono Co.).			
(A) Crooked Creek below the City of Los Angeles gauging station.	Closed to all fishing all year.		**J**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(B) Crooked Creek and tributaries above the City of Los Angeles gauging station.	~~Last Saturday in April through Nov. 15. Only artificial lures with barbless hooks may be used.~~All year. Only artificial flies with barbless hooks may be used.	0 trout	**A7**
(~~53~~38) Crowley Lake (Mono Co.). (See individual listings for regulations on tributary waters which include: Convict, Crooked, Hilton, Hot, McGee, and Whiskey creeks and the upper Owens River).			
(A) Crowley Lake within 1,800 feet of the outlet dam (this area is marked with a series of buoys).	Closed to all fishing all year for safety purposes.		**J**
(B) Crowley Lake, except for the closed area near the outlet dam (see above).	Last Saturday in Apr.~~il~~ through Jul.~~y~~ 31.	5 trout~~ per day. 10 trout in possession.~~	**D1**
	~~Aug. 1 through Nov. 15. Minimum size limit:18 inches total length. Only artificial lures with barbless hooks may be used.~~ Aug.~~ust~~ 1 through Nov.~~ember~~ 15. Only artificial lures may be used. Minimum size limit: 18 inches total length.	2 trout	**E5**
(~~53.5~~39) Davis Creek (Goose Lake tributary) and tributaries (Modoc Co.).	Sat.~~urday~~ preceding Memorial Day through~~ November 15. Only artificial lures with barbless hooks may be used.~~ the last day in Feb.~~ruary~~.	~~0 trout~~5 trout	**G1**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~54~~40) Davis Lake tributaries (Plumas Co.).	Sat.~~urday~~ preceding Memorial Day through ~~Nov. 15.~~ the last day in Feb.~~ruary~~.	5 trout ~~per day. 10 trout in possession.~~	**G1**
(~~54.5~~41) Deadman Creek (Mono Co.).			
(A) Deadman Creek downstream from Hwy. 395. See Owens River 7.50(b)(104).	~~Last Saturday in April through Nov. 15. Maximum size limit: 16 inches total length. Only artificial lures with barbless hooks may be used.~~All year. Only artificial lures with barbless hooks may be used.	~~2 trout~~0 trout	**A6**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
~~(B) Deadman Creek upstream from Hwy. 395.~~	~~Last Saturday in April through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~	**SR**
(~~55~~42) Deep Creek (San Bernardino Co.) from headwaters at Little Green Valley to confluence of Willow Creek.	All year. Only artificial lures ~~with barbless hooks~~ may be ~~use~~used.	2 trout	**A3**
~~(56) Deer Creek (Tehama Co.).~~			
~~(A) From 250 feet below Upper Deer Creek Falls and fishway (located 1.5 miles upstream from Potato Patch Campground) downstream 31 miles to U.S. Geological Survey gauging station cable crossing at mouth of Deer Creek Canyon (see Section 2.35 for closure at Upper Deer Creek Falls).~~	~~Last Saturday in April through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From U.S. Geological Survey gauging station~~	~~June 16 through Sept. 30.~~	~~2 hatchery trout or hatchery~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~cable crossing at mouth of Deer Creek Canyon downstream to mouth of Deer Creek.~~		~~steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	
~~(57) Deer Creek (Yuba and Nevada Cos.) from mouth to Smartville-Englebright Dam road crossing.~~	~~Fourth Saturday in May through Oct. 15. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(58) Diaz Lake (Inyo Co.).~~	~~First Saturday in Mar. through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~	**SL**
	~~Nov. 16 through the Friday preceding the first Saturday in Mar.~~	~~5 trout~~	
~~(59) [Reserved]~~			
(43) Dismal Creek (Modoc Co.).	Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures with barbless hooks may be used.	0 trout	**G6**
~~(59.5) Dry Creek and tributaries (Placer Co.) east of the Atkinson Street Bridge in Roseville.~~	~~Fourth Saturday in May through Oct. 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(60) Dry Creek (Yuba and Nevada Co.) from mouth to Sid Smith Dam about one mile above junction of Scott Forbes and Peoria roads.~~	~~Fourth Saturday in May through Oct. 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~61~~44) Eagle Lake and tributaries (Lassen Co.).			

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(A) Eagle Lake.	Sat.~~urday~~ preceding Memorial Day through ~~Dec. 31.~~ the last day in Feb.~~ruary~~.	2 trout. 4 trout in possession.	**G2**
(B) Eagle Lake inside the break-water at the Gallatin Marina ~~and Pine Creek Slough and Pine Creek below State Highway 44~~.	Closed to all fishing all year.		**J**
(C) Eagle Lake tributaries, including Pine Creek ~~above State Hwy. 44~~.	~~Saturday preceding Memorial Day through Nov. 15.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~.	5 trout ~~per day. 10 trout in possession.~~	**G1**
~~(61.5) Earl Lake/Talawa (Del Norte Co.).~~	~~All year. Only barbless hooks may be used. Cutthroat trout minimum size limit: 10 inches.~~	~~2 cutthroat trout. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(62.5) Edson Creek and all tributaries (Siskiyou Co.).~~	~~See McCloud River 7.50(b)(115).~~		**Del07**
(~~63~~45) Eel River (Humboldt, Lake, Mendocino and Trinity cos.).	~~Low-Flow Restrictions, Section 8.00, also apply, see below for more detail.~~		
~~ALL WATERS OF THE EEL RIVER DRAINAGE EXCEPT THOSE LISTED BELOW ARE CLOSED TO ALL FISHING.~~			
~~(A) Main stem.~~			
~~1. From mouth to Fulmor Road, at its paved junction with the south bank of the Eel River.~~	~~All year. Only artificial lures with barbless hooks may be used from April 1 through the Friday preceding the fourth Saturday in May. Only barbless hooks may be used from fourth Saturday in May through Mar. 31.~~	~~Catch and Release of Chinook Salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~2. From Fulmor Road, at its paved junction with the south bank of the Eel River, to South Fork Eel River. Also see Low-Flow Restrictions, Section 8.00(a)(1).~~	~~All year. Only artificial lures with barbless hooks may be used from Apr. 1 through Sept. 30. Only barbless hooks may be used from Oct. 1 through Mar. 31.~~	~~Catch and Release of Chinook Salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~3. From South Fork Eel River to Cape Horn Dam. (See also Pillsbury Lake tributaries (7.50(b)(138).~~	~~Jan. 1 through Mar. 31 and Fourth Saturday in May through Sept. 30. Only artificial lures with barbless hooks may be used.~~	~~Catch and Release of Chinook Salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~Apr. 1 through the Fourth Friday in May and Oct. 1 through Dec. 31.~~	~~Closed to all fishing.~~	
(A) Eel River above Lake Pillsbury and tributaries to Lake Pillsbury (Lake Co.).	Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures may be used.	2 trout	**G3**
(B) Van Duzen River.			
~~1.~~ Main stem and tributaries ~~above~~upstream of Eaton Falls, located about ½ mile upstream of the mouth of the South Fork (Little Van Duzen) and 2 ½ miles ~~west~~downstream of Dinsmore (Humboldt and Trinity cos).	~~Last Saturday in Apr. through Nov. 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures may be used.	~~5 trout~~2 trout	**G3**
~~2. Main stem from its junction with the Eel River to the end of Golden Gate Drive near Bridgeville (approximately 4,000 feet upstream from the Little Golden Gate Bridge). Also~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Sept. 30. Only barbless hooks may be used from Oct. 1 through Mar. 31.~~	~~Catch and Release of Chinook salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~see Low-Flow Restrictions, Section 8.00(a)(3).~~		~~steelhead** in possession.~~	
~~(C) South Fork Eel River from mouth to Rattlesnake Creek. Also see Low-Flow Restrictions, Section 8.00(a)(2).~~	~~Apr. 1 to Fourth Friday in May. Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Sept. 30. Only barbless hooks may be used from Oct. 1 through Mar. 31.~~	~~Closed to all fishing Catch and Release of Chinook salmon 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~Apr. 1 to Fourth Friday in May.~~	~~Closed to all fishing~~	
~~(D) Middle Fork Eel River.~~ (C) Eel River Middle Fork. ~~1. Middle Fork main stem from mouth to Bar Creek. Also see Low-Flow Restrictions, Section 8.00(a)(2).~~	~~Jan. 1 through May 31 and July 16 through Sept. 30. At all times, only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~Jun. 1 through July 15 and Oct. through Dec. 31.~~	~~Closed to all fishing~~	
~~2. Middle Fork tributaries above Indian Dick/Eel River Ranger Station Road~~ 1. Eel River Middle Fork tributaries (Hammerhorn Creek, Rattlesnake Creek, Beaver Creek, Fly Creek, and Bar Creek) upstream of USFS M1 Road crossing (Mendocino and Trinity cos).	~~Last Saturday in Apr. through Nov.15. Maximum size limit:14 inches total length.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures may be used.	~~5 trout~~2 trout	**G3**
~~3. Middle Fork and tributaries above mouth of Uhl Creek.~~ 2. Eel River Middle Fork and tributaries upstream of mouth of Uhl Creek (Trinity Co.)	~~Last Saturday in Apr. through Nov. 15. Maximum size limit:14 inches total length. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through the last day in	2 trout	**G3**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
	Feb.~~ruary~~. Only artificial lures may be used.		
~~4.~~ 3. Balm of Gilead Creek~~, and tributaries above falls 1 1/4 miles from mouth.~~upstream of falls located 1.2 mile from mouth and one mile downstream of Wright's Valley Trail crossing (Trinity Co.)	~~Last Saturday in Apr. through Nov. 15. Maximum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures may be used.	2 trout	**G3**
~~5. North Fork of Middle Fork and tributaries above mouth of Willow Creek.~~ 4. Eel River North Fork of the Middle Fork upstream of mouth of Willow Creek (Trinity Co.)	~~Last Saturday in Apr. through Nov. 15. Maximum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures may be used.	2 trout	**G3**
(~~64~~46) El Estero Lake (Monterey Co.) portions of the lake south of the Pearl Street bridge known as Camino Aquajito Arm and Camino El Estero finger.	Closed to all fishing all year.		**J**
~~(65) Elk Creek (Mendocino Co.). Also see Section 8.00(b). Main stem below the confluence of South Fork Elk Creek.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(66) Elk River (Humboldt Co.) downstream from Highway 101 bridge, excluding tributaries.~~	~~Nov. 1 through Mar. 31. Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Oct. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or 4 hatchery steelhead** in possession.~~	**HSS**
(~~64~~47) Fall River Complex (Shasta Co.).			

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(A) Fall River and tributaries from its origin at Thousand Springs downstream to the ~~mouth of the Tule River and including Spring Creek and excluding all other tributaries.~~PG&E Pit #1 Diversion Dam, ~~including all lakes, tributaries , and springs,~~ excluding Bear Creek. (B) Lava Creek (C) Little Tule River (D) Tule River (E) Horr Pond (F) Ja She Creek (G) Big Lake (H) Thousand Springs (I) Spring Creek (J) Ahjumawi Lava Springs (K) Eastman Lake	~~Last Saturday in Apr. through Nov. 15. Maximum size limit:14 inches total length. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures may be used.	2 trout	**F3**
	Oct.~~ober~~ 1 through the Fri.~~day~~ preceding Memorial Day. Only artificial lures with barbless hooks may be used.	0 trout	**I6**
~~(68) Feather River below Fish Barrier Dam (Butte, Sutter and Yuba cos.).~~			
~~(A) From Fish Barrier Dam to Table Mountain bicycle bridge in Oroville.~~	~~Closed to all fishing all year~~		**HSS**
~~(B) From Table Mountain bicycle bridge to Highway 70 bridge.~~	~~Jan. 1 through July 15. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~(C) From Highway 70 bridge to the unimproved boat ramp above the Thermalito Afterbay Outfall.~~	~~All year.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout orhatchery steelhead** in possession.~~	**HSS**
~~(D) From the unimproved boat ramp above the Thermalito Afterbay Outfall to 200 yards above the Live Oak boat ramp.~~	~~Jan. 1 through July 15~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~July 16 through Oct. 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 3 Chinook Salmon. 6 Chinook Salmon in possession.~~	
	~~Oct. 16 through Dec. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	
~~(E) From 200 yards above Live Oak boat ramp to the mouth. For purposes of this regulation, the lower boundary is defined as a straight line drawn from the peninsula point on the west bank to the Verona Marine boat ramp.~~	~~Jan. 1 through July 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~July 16 through Dec. 16.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in~~	

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
		~~possession. 3 Chinook Salmon. 6 Chinook Salmon in possession.~~	
	~~Dec. 17 to Dec. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	
~~(68.1) Feather River, Middle Fork (Plumas Co.), from the Union Pacific Railroad Bridge (1/4 mile upstream of County A-23 bridge) to the Mohawk Bridge.~~	~~First Saturday in April through Nov. 15. possession.~~	~~5 trout per day. 10 trout in~~	**SR**
(~~68.2~~48) Feather River North Fork from Belden Bridge downstream to Cresta Powerhouse (excluding reservoirs) (Butte and Plumas ~~Cos.~~cos.).	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures with barbless hooks may be used.	0 trout	**G6**
(~~68.3~~49) Fish Slough (Mono Co.).			
(A) The portions of Fish Slough which lie within the ~~Owens Valley Native Fishes Sanctuary and~~ BLM Springs.	Closed to all fishing all year.		**J**
(B) All other portions of Fish Slough. Also, see Section 5.00(b)(10) for black bass regulations.	~~Last Saturday in Apr. through Nov. 15.~~All year	5 trout	**A1**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr.~~	~~0 trout~~	
~~(69) Freshwater Creek (Humboldt Co.) downstream from bridge~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be~~	~~2 hatchery trout hatchery steelhead**. 4~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~at "3 Corners" on the Old Arcata Road, excluding tributaries.~~	~~used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~hatchery trout or hatchery steelhead** in possession.~~	
~~(69.5) Freshwater Lagoon (Humboldt Co.).~~	~~All year.~~	~~5 trout per day. 10 trout in possession.~~	**SL**
~~(70) Garcia River (Mendocino Co.). Also see Section 8.00(b). Main stem below the Eureka Hill Road bridge.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(50) George Lake (Lake George, Mono Co.)	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(~~71~~51) Golden Trout Wilderness Area (Tulare Co.), excluding the main stem Kern River (see subsection 7.50(b)(69), and the Tule River drainage (See subsection 7.50(b)(154)).	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~ All year. Only artificial lures may be used.	~~5 trout~~2 trout	**A3**
(52) Goose Lake and tributaries (Modoc Co.) excluding Davis Creek (See subsection 7.50(b)(39), and Pine Creek (See subsection 7.50(b)(106)).	Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures with barbless hooks may be used.	0 trout	**G6**
(53) Grant Lake (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(54) Gull Lake (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
~~(71.5) Grass Valley Creek Reservoir (Trinity Co.).~~	~~All year. Only artificial lures may be used.~~	~~2 trout~~	**SR**
~~(72) Greenwood Creek (Mendocino Co.). Also see Section 8.00(b).~~			

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~Main stem below the log bridge about 1 1/2 miles east of Highway 1.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(72.5) Guadalupe River below Guadalupe Reservoir (Santa Clara Co.) including Los Gatos Ck. Below Vasona Lake, and Alamitos Ck. and Arroyo Calero below Calero Reservoir.~~	~~Last Saturday in April through November 15. Only artificial lures and barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(73) Gualala River (Mendocino and Sonoma cos.). Also see Section 8.00(b). Main stem below the confluence of Wheatfield and South Forks.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31. Fishing from a flotation device is prohibited from Nov. 15 through Feb. 28 from the confluence of the North Fork to the Highway 1 bridge.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~74~~55) Hat Creek (Shasta Co.) from Lake Britton upstream to Baum Lake, exclusive of the concrete Hat No. 2 intake canal between Baum Lake and the Hat No. 2 Powerhouse.	~~Last Saturday in Apr. through Nov.15. Minimum size limit:18 inches total length. Only artificial lures with barbless hooks may be used. Aquatic invertebrates of the orders Plecoptera (stoneflies), Ephemeroptera (mayflies) and Trichoptera (caddisflies) may not be taken or possessed~~ All year. Only artificial lures with barbless hooks may be used.	~~2 trout~~0 trout	**A6**
~~(75) Hat Creek No.1 and Cassel Forebays (Shasta Co.). Those portions of Hat Creek known as No. 1 Forebay and Cassel Forebay.~~	~~Last Saturday in Apr. through Nov. 15~~	~~5 trout per day. 10 trout in possession.~~	**SR**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~7~~56) Heenan Lake and tributaries (Alpine Co.).			
(A) Heenan Lake.	~~Only on Fridays, Saturdays, and Sundays from the Friday before Labor Day through the last Sunday in October. Fishing hours: Only from sunrise to sunset. Only artificial lures with barbless hooks may be used.~~ Sep.~~tember~~ 1 through Nov.~~ember~~ 30. Only artificial lures with barbless hooks may be used.	0 trout	**H6**
(B) Heenan Lake tributaries.	Closed to all fishing all year.		
(~~7~~57) Hennessey Lake tributaries (Napa Co.).	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	~~5 trout.~~ 2 trout. 4 trout in possession.	**F2**
(~~77.3~~58) Hilton Creek (Mono Co.).			
~~(A)~~ Hilton Creek downstream from Crowley Lake Drive.	~~Last Saturday in April through the Friday preceding Memorial Day and Oct. 1 through Nov. 15. Minimum size limit: 18 inches total length. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	~~2 trout~~ 5 trout	**F1**
	~~Saturday preceding Memorial Day through Sept. 30. Only artificial lures with barbless hooks may be used.~~	~~5 per day, 10 in possession~~	**Del08**
~~(B) Hilton Creek upstream from Crowley Lake Drive.~~	~~Last Saturday in April through Nov. 15.~~	~~5 trout per day. 10 trout in possession~~	**SR**
(~~77.5~~59) Hobart Creek (Tuolumne Co.), tributary to Spicer Meadows Reservoir.	~~July 1 through Nov. 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures may be used.	~~5 trout per day. 10 trout in possession.~~ 2 trout	**F3**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(60) Horseshoe Lake (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(~~78~~61) Hot Creek (Mono Co.). Hot Creek from the State hatchery property line to the confluence with the Owens River.	All year. Only artificial flies with barbless hooks may be used.	0 trout	**A7**
(~~79~~62) Illinois River and tributaries (Del Norte Co.).	Closed to all fishing all year.		**J**
(~~80~~63) Independence Lake and tributaries (Nevada and Sierra ~~Cos.~~cos.).	NOTE: ALL LAHONTAN CUTTHROAT TROUT TAKEN SHALL BE IMMEDIATELY RETURNED TO THE WATER		
(A) Independence Lake tributaries and Independence Lake within 300 feet of the mouths of all tributaries.	Closed to all fishing all year.		**J**
(B) Independence Lake except Independence Lake within 300 feet of the mouths of all tributaries.	~~All year Only artificial lures with barbless hooks may be used~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	~~5 trout per day. 10 trout in possession~~ 0 trout	**F6**
(~~81~~64) Indian Tom Lake (Siskiyou Co.).	All year.	2 trout. 4 trout in possession.	**A2**
~~(82) Inyo County, Southwestern Portion, in all waters bounded by the Inyo County line on the south and west, Independence Creek on the north (open to fishing), and Highway 395 on the east (also see Cottonwood Creek and Diaz Lake Restrictions.)~~	~~First Sat. in March through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~	**SL, SR**
~~(83) Islay Creek (San Luis Obispo Co.).~~	~~Closed to all fishing all year~~		**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(65) Isabella Lake (Lake Isabella, Kern Co.)	All year.	5 trout	**A1**
(~~84~~66) Junction Lake and tributaries (Mono Co.) including the lake's outlet stream to Highway 108.	Closed to all fishing all year.		**J**
(67) June Lake (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
~~(84.5) Kaweah River and tributaries (Tulare Co.).~~	~~All year.~~	~~5 trout per day. 10 trout in possession.~~	**SR**
(~~85~~68) Kent Lake tributaries (Marin Co.).	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	~~5 trout~~2 trout. 4 trout in possession.	**F2**
(~~86~~69) Kern River (Kern and Tulare ~~Cos.~~cos.)			
(A) From Lake Isabella upstream to the Johnsondale bridge.	All year.	5 trout ~~per day. 10 trout in possession.~~	**A1**
(B) From Johnsondale bridge upstream to the ~~point where U.S. Forest Service Trail 33E30 heads east to joint the Rincon Trail.~~Sequoia National Park boundary near the Kern Canyon Ranger Station.	~~Last Saturday in Apr. through Nov. 15. Minimum size limit:14 inches total length.~~ All year. Only artificial lures ~~with barbless hooks~~ may be used.	2 trout	**A3**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
(C) Downstream of Lake Isabella.	All year.	5 trout	**A1**
~~(C) From the point where U.S. Forest Service Trail 33E30 heads east to join the Rincon Trail upstream~~	~~Last Saturday in Apr. through Nov. 15. Maximum size limit: 10 inches total length for rainbow trout only. Only artificial lures~~	~~2 trout~~	**Del09**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~to the mouth of Tyndall Creek.~~	~~with barbless hooks may be used.~~		
~~(87~~70) Kings River (Fresno Co.).			
(A) Kings River, South Fork from its confluence with Copper Creek downstream to the Highway 180 crossing at Boyden Cave.	All year.	2 trout. 4 trout in possession.	**A2**
(B) Kings River South Fork, from the Highway 180 crossing at Boyden Cave downstream to the main stem; Middle Fork, from the western boundary of Kings Canyon National Park downstream to the main stem; and main stem, from the confluence of the South and Middle forks downstream to Garnet Dike Campground.	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
(C) Kings River, from Garnet Dike Campground downstream to Pine Flat Lake.	All year.	2 trout. 4 trout in possession.	**A2**
(D) Kings River from Pine Flat Dam downstream to U. S. Army Corps of Engineers Bridge on Pine Flat Road.	~~Last Saturday in Apr. through Nov. 15.~~Closed to all fishing all year.	~~5 trout~~	**J**
(E) 1. Kings River from the U.S. Army Corps of Engineers Bridge on Pine Flat Road downstream to Cobbles (Alta) Weir.	All year.	5 trout	**A1**
~~(E)~~2. Kings River Thorburn Spawning Channel, the 2,200-foot-long channel located 5	Closed to all fishing all year.		**J**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
miles downstream from Pine Flat Dam, and the reach of river within a 200-foot radius of the channel exit.			
(F) Kings River, from Cobbles (Alta) Weir downstream to the Highway 180 crossing.	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
(G) Kings River from the Highway 180 crossing downstream.	All year.	5 trout	**A1**
~~(88) Reserved.~~			
(~~89~~71) Kirman (Carmen) Lake and all its tributaries (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il.~~ through ~~Nov.~~ Nov.~~ember~~ 15. Only artificial lures may be used. Minimum size limit: ~~16~~ 18 inches total length. ~~Only artificial lures with barbless hooks may be use~~	2 trout	**B5**
~~(90) Kirman (Carmen) Lake tributaries (Mono Co.).~~	~~Closed to all fishing all year.~~		**Del10**
(72) Kitchen Creek (San Diego Co.) upstream of Lake Morena, and all its tributaries.	All year. Only artificial lures may be used.	2 trout	**A3**
(~~91~~73) Klamath River ~~Regulations (See Section 1.74 for salmon punch card requirements.~~			
~~(A)~~ Klamath River main stem and all tributaries above Iron Gate Dam~~, except Shovel Creek and tributaries. The Klamath River main stem within 250 feet of the mouth of Shovel Creek is closed to all fishing November 16 through June 15~~.	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout~~ per day. 10 trout in possession.~~	**F1**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
	Oct.~~ober~~ 1 through the Fri.~~day~~ preceding Memorial Day. Only artificial lures with barbless hooks maybe used.	0 trout	**I6**
~~(B) Shovel Creek and tributaries above mouth of Panther Creek.~~	~~Last Saturday in Apr. through Nov. 15.~~	~~5 trout~~	**Del11**
~~(C) Shovel Creek and tributaries up to and including Panther Creek.~~	~~Closed to all fishing all year~~		**Del11**

~~(91.1) Anadromous Waters of the Klamath River Basin Downstream of Iron Gate and Lewiston dams. The regulations in this subsection apply only to waters of the Klamath River Basin which are accessible to anadromous salmonids. They do not apply to waters of the Klamath River Basin which are inaccessible to anadromous salmon and trout, portions of the Klamath River system upstream of Iron Gate Dam, portions of the Trinity River system upstream of Lewiston Dam, and the Shasta River and tributaries upstream of Dwinnel Dam. Fishing in these waters is governed by the General Regulations for non-anadromous waters of the North Coast District (see Section 7.00, subsection (a)(4)).~~

~~(A) Restrictions and Requirements.~~

1. ~~Only barbless hooks may be used. (For definitions regarding legal hook types, hook gaps and rigging see Chapter 2, Article 1, Section 2.10.)~~
2. ~~During closures to the take of adult salmon, it shall be unlawful to remove any adult Chinook Salmon from the water by any means.~~
3. ~~See Section 1.74 for sport fish report card requirements.~~

~~(B) General Area Closures.~~

1. ~~No fishing is allowed within 750 feet of any Department of Fish and Wildlife fish-counting weir.~~
2. ~~No fishing is allowed from the Ishi Pishi Road bridge upstream to and including Ishi Pishi Falls from August 15 through December 31. EXCEPTION: members of the Karuk Indian Tribe listed on the current Karuk Tribal Roll may fish at Ishi Pishi Falls using hand-held dip nets.~~
3. ~~No fishing is allowed from September 15 through December 31 in the Klamath River within 500 feet of the mouths of the Salmon, the Shasta and the Scott rivers and Blue Creek.~~
4. ~~No fishing is allowed from June 15 through September 14 in the Klamath River from 500 feet above the mouth of Blue Creek to 500 feet downstream of the mouth of Blue Creek.~~

~~(C) Klamath River Basin Possession Limits.~~

1. ~~Trout Possession Limits.~~
   a. ~~The Brown Trout possession limit is 20.~~
   b. ~~The hatchery trout or hatchery steelhead possession limits are as follows:~~
      ~~(i) Klamath River - 4 hatchery trout or hatchery steelhead.~~
      ~~(ii) Trinity River - 4 hatchery trout or hatchery steelhead.~~
2. ~~Chinook Salmon Possession Limits.~~

a. ~~Klamath River downstream of the Highway 96 bridge at Weitchpec from January 1 to August 14 and the Trinity River downstream of the Old Lewiston Bridge to the confluence of the South Fork Trinity River from January 1 to August 31: 2 Chinook Salmon.~~

b. ~~Klamath River from August 15 to December 31 and Trinity River from September 1 to December 31: 6 Chinook Salmon. No more than 3 Chinook Salmon over 23 inches total length may be retained when the take of salmon over 23 inches total length is allowed.~~

~~(D) Klamath River Basin Chinook Salmon Quotas.~~

~~The Klamath River fall-run Chinook Salmon take is regulated using quotas. Accounting of the tribal and non-tribal harvest is closely monitored from August 15 through December 31 each year. These quota areas are noted in subsection (b)(91.1)(E) with "Fall Run Quota" in the *Open Season and Special Regulations* column.~~

1. ~~Quota for Entire Basin.~~

~~The 2020 Klamath River Basin quota is 7,6371,296 Klamath River fall-run Chinook Salmon over 23 inches total length. The department shall inform the Commission, and the public via the news media, prior to any implementation of restrictions triggered by the quotas. (NOTE: A department status report on progress toward the quotas for the various river sections is updated weekly, and available at 1-800-564-6479.)~~

2. ~~Subquota Percentages.~~

a. ~~The subquota for the Klamath River upstream of the Highway 96 bridge at Weitchpec and the Trinity River is 50% of the total Klamath River Basin quota.~~

(i) ~~The subquota for the Klamath River from 3,500 feet downstream of the Iron Gate Dam to the Highway 96 bridge at Weitchpec is 17% of the total Klamath River Basin quota.~~

(ii) ~~The subquota for the Trinity River main stem downstream of the Old Lewiston Bridge to the Highway 299 West bridge at Cedar Flat is 16.5% of the total Klamath River Basin quota.~~

(iii) ~~The subquota for the Trinity River main stem downstream of the Denny Road bridge at Hawkins Bar to the confluence with the Klamath River is 16.5% of the total Klamath River Basin quota.~~

b. ~~The subquota for the lower Klamath River downstream of the Highway 96 bridge at Weitchpec is 50% of the total Klamath River Basin quota.~~

(i) ~~The Spit Area (within 100 yards of the channel through the sand spit formed at the Klamath River mouth) will close when 15% of the total Klamath River Basin quota is taken downstream of the Highway 101 bridge.~~

~~(E) Klamath River Basin Open Seasons and Bag Limits.~~

~~All anadromous waters of the Klamath River Basin are closed to all fishing for all year except those areas listed in the following table. Bag limits are for trout and Chinook Salmon in combination unless otherwise specified.~~

~~***Body of Water***~~	~~***Open Season and Special Restrictions***~~	~~***Daily Bag Limit***~~

~~1. Bogus Creek and tributaries.~~	~~Fourth Saturday in May through August 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead.**~~
~~2. Klamath River main stem from 3,500 feet downstream of Iron Gate Dam to the mouth.~~		
~~a. Klamath River from 3,500 feet downstream of the Iron Gate Dam to the Highway 96 bridge at Weitchpec.~~	~~January 1 to August 14.~~	~~0 Chinook Salmon~~ ~~2 hatchery trout or hatchery steelhead**~~
	~~Fall Run Quota 220 Chinook Salmon August 15 to December 31, 2020.~~	~~2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length.~~ ~~2 hatchery trout or hatchery steelhead**~~
	~~Fall Run Quota Exception: Chinook Salmon over 23 inches total length may be retained from 3,500 feet downstream of Iron Gate Dam to the Interstate 5 bridge when the department determines that the adult fall-run Chinook Salmon spawning escapement at Iron Gate Hatchery exceeds 8,000 fish. Daily bag and possession limits specified for fall-run Chinook Salmon apply during this exception.~~	
~~b. Klamath River downstream of the Highway 96 bridge at Weitchpec.~~	~~January 1 to August 14.~~	~~2 Chinook Salmon~~ ~~2 hatchery trout or hatchery steelhead**~~
	~~Fall Run Quota 648 Chinook Salmon August 15 to December 31, 2020.~~	~~2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length.~~

		~~2 hatchery trout or hatchery steelhead**~~
	~~Fall Run Quota Exception: Spit Area (within 100 yards of the channel through the sand spit formed at the Klamath River mouth). This area will be closed to all fishing after 15% of the Total Klamath River Basin Quota has been taken.~~ ~~All legally caught Chinook Salmon must be retained. Once the adult (greater than 23 inches) component of the total daily bag limit has been retained anglers must cease fishing in the spit area.~~	
~~3. Salmon River main stem, main stem of North Fork downstream of Sawyer's Bar bridge, and main stem of South Fork downstream of the confluence of the East Fork of the South Fork.~~	~~November 1 through February 28.~~	~~2 hatchery trout or hatchery steelhead**~~
~~4. Scott River main stem downstream of the Fort Jones-Greenview bridge to the confluence with the Klamath River.~~	~~Fourth Saturday in May through February 28.~~	~~2 hatchery trout or hatchery steelhead**~~
~~5. Shasta River main stem downstream of the Interstate 5 bridge north of Yreka to the confluence with the Klamath River.~~	~~Fourth Saturday in May through August 31 and November 16 through February 28.~~	~~2 hatchery trout or hatchery steelhead**~~
~~6. Trinity River and tributaries.~~		
~~a. Trinity River main stem from 250 feet downstream of Lewiston Dam to the Old Lewiston Bridge.~~	~~April 1 through September 15. Only artificial flies with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**~~
~~b. Trinity River main stem downstream of the Old Lewiston Bridge to the Highway 299 West bridge at Cedar Flat.~~	~~January 1 to August 31.~~	~~2 Chinook Salmon~~ ~~10 Brown Trout~~ ~~2 hatchery trout or hatchery steelhead**~~

	~~Fall Run Quota 214 Chinook Salmon September 1 to December 31, 2020.~~	~~2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length.~~ ~~10 Brown trout~~ ~~2 hatchery trout or hatchery steelhead**~~
	~~Fall Run Quota Exception: Chinook Salmon over 23 inches total length may be retained downstream of the Old Lewiston Bridge to the mouth of Indian Creek when the department determines that the adult fall-run Chinook Salmon spawning escapement at Trinity River Hatchery exceeds 4,800 fish. Daily bag and possession limits specified for fall-run Chinook Salmon apply during this exception.~~	
~~c. Trinity River main stem downstream of the Highway 299 West bridge at Cedar Flat to the Denny Road bridge at Hawkins Bar.~~	~~January 1 through August 31.~~	~~2 Chinook Salmon~~ ~~10 Brown Trout~~ ~~2 hatchery trout or hatchery steelhead**~~
	~~September 1 through December 31.~~	~~Closed to all fishing.~~
~~d. New River main stem downstream of the confluence of the East Fork to the confluence with the Trinity River.~~	~~September 15 through November 15. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**~~
~~e. Trinity River main stem downstream of the Denny Road bridge at Hawkins Bar to the mouth of the South Fork Trinity River.~~	~~January 1 to August 31.~~	~~2 Chinook Salmon~~ ~~10 Brown Trout~~ ~~2 hatchery trout or hatchery steelhead**~~

	~~Fall Run Quota 214 Chinook Salmon September 1 through December 31, 2020. This is the cumulative quota for subsections 6.e. and 6.f. of this table.~~	~~2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length.~~ ~~10 Brown Trout~~ ~~2 hatchery trout or hatchery steelhead**~~
~~f. Trinity River main stem downstream of the mouth of the South Fork Trinity River to the confluence with the Klamath River.~~	~~January 1 to August 31.~~	~~0 Chinook Salmon~~ ~~10 Brown Trout~~ ~~2 hatchery trout or hatchery steelhead**~~
	~~Fall Run Quota 214 Chinook Salmon September 1 through December 31, 2020. This is the cumulative quota for subsections 6.e. and 6.f. of this table.~~	~~2 Chinook Salmon - no more than 1 fish over 23 inches total length until subquota is met, then 0 fish over 23 inches total length.~~ ~~10 Brown Trout~~ ~~2 hatchery trout or hatchery steelhead**~~
~~g. Hayfork Creek main stem downstream of the Highway 3 bridge in Hayfork to the confluence with the South Fork Trinity River.~~	~~November 1 through March 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**~~
~~h. South Fork Trinity River downstream of the confluence with the East Fork of the South Fork Trinity River to the South Fork Trinity River bridge at Hyampom.~~	~~November 1 through March 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**~~
~~i. South Fork Trinity River downstream of the South Fork Trinity River bridge at Hyampom to the confluence with the Trinity River.~~	~~November 1 through March 31.~~	~~0 Chinook Salmon.~~ ~~2 hatchery trout or hatchery steelhead**~~

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~(91.2) Special Order Regarding Take of Chinook Salmon in Anadromous Waters of the Klamath River Basin Downstream of Iron Gate and Lewiston dams.~~	~~Notwithstanding subsection (b)(91.1) of Section 7.50, between January 1 and August 14 on the Klamath River and between January 1 and August 31 on the Trinity River, and South Fork Trinity River, Chinook Salmon may not be taken or possessed except as authorized on the identified segments of rivers as listed in the following table. All other restrictions apply.~~		**HSS**
~~(A) Klamath River segment identified in subsection 7.50(b)(91.1)(E)2.b.~~	~~July 1 through August 14~~	~~1 Chinook Salmon 2 Chinook Salmon in possession~~	**HSS**
~~(B) Trinity River segment identified in subsection 7.50(b)(91.1)(E)6.b.~~	~~July 1 through August 31~~	~~1 Chinook Salmon 2 Chinook Salmon in possession~~	**HSS**
~~(C) Trinity River segment identified in subsection 7.50(b)(91.1)(E)6.c.~~	~~July 1 through August 31~~	~~1 Chinook Salmon 2 Chinook Salmon in possession~~	**HSS**
~~(D) Trinity River segment identified in subsection 7.50(b)(91.1)(E)6.e.~~	~~July 1 through August 31~~	~~1 Chinook Salmon 2 Chinook Salmon in possession~~	**HSS**
(~~92~~74) Klopp Lake (Humboldt Co.).	All year. Only artificial lures with barbless hooks may be used.	2 trout	**A6**
~~(93) Laguna de Santa Rosa (Sonoma Co. tributary to Russian River) upstream from Guerneville Road bridge.~~	~~Last Saturday in Apr. through Nov. 15.~~	~~Open to fishing for non- salmonids only. Closed to the take of trout, and steelhead.~~	**HSS**
~~(95) Lagunitas Creek and tributaries (Marin Co).~~	~~Closed to all fishing all year~~		**HSS**
(~~96~~75) Lagunitas Lake (Marin Co.).	All year. ~~Maximum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used~~ Only artificial lures may be used.	2 trout	**A3**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~96.5~~76) Lane Lake (Mono Co.).	~~Last Saturday in Apr. through Nov. 15.~~ All year. Only artificial lures may be used.	2 trout	**A3**
~~(98) Lassen Creek and tributaries (Modoc Co.)~~	~~Saturday preceding Memorial Day through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	**Del12**
(~~98.5~~77) Laurel Lakes and tributaries (Mono Co.).	~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used~~All year. Only artificial lures may be used. Minimum size limit: 14 inches total length.	2 trout	**A4**
(~~98.6~~78) Lee Vining Creek from the Lee Vining conduit downstream to Mono Lake (Mono Co.).	~~Last Saturday in Apr. through Nov. 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	2 trout. 4 trout in possession.	**F2**
	Oct.~~ober~~ 1 through the Fri.~~day~~ preceding Memorial Day. Only artificial lures with barbless hooks may be used.	0 trout	**I6**
~~(99) Limekiln Creek and tributaries above Highway 1 (Monterey Co.). Also see Low-Flow Restrictions, Section 8.00(c)(9).~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~100~~79) Little Butano Creek above the diversion dam at Butano State Park (San Mateo Co.).	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	~~5 trout~~0 trout	**F6**
~~(101) Little Cottonwood Creek and tributaries (Inyo Co.).~~	~~See Cottonwood Creek 7.50(b)(48).~~		

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~(102) Little River (Humboldt Co.) downstream from the County Road bridge at Crannell, excluding tributaries.~~	~~Fourth Saturday in May through Mar. 31. Cutthroat trout minimum size limit: 10 inches total length. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 cutthroat trout 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(103) Little Sur River and tributaries above Coast Road (Monterey Co.).~~	~~Fourth Saturday in May through Oct. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~103.5~~80) Little Truckee River (Sierra and Nevada ~~Cos.~~cos.) from Stampede Reservoir Dam downstream to Boca Reservoir.	~~Last Saturday in Apr. through Nov. 15. Maximum size limit: 14 inches total length~~. All year. Only artificial lures with barbless hooks may be used.	~~2 trout~~0 trout	**A6**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	**Del13**
~~(104) Llagas Creek (Santa Clara Co.). Also see Low-Flow Restrictions, Section 8.00(c)(5).~~			
~~(A) From mouth to Monterey Highway Bridge.~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From Monterey Highway Bridge to Chesbro Dam.~~	~~Closed to all fishing all year~~		**HSS**
~~(104.3) Los Angeles Aqueduct from Owens~~	~~First Saturday in Mar. through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~	**SR**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~River to Alabama Gates (Inyo County).~~			
	~~Nov. 16 through the Friday preceding the first Saturday in Mar.~~	~~5 trout~~	
(81) Los Gatos Creek (Santa Clara Co.) upstream of Camden Avenue drop including Lexington Reservoir and all tributaries.	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
~~(104.5) Los Osos Creek (San Luis Obispo Co.).~~	~~Closed to all fishing all year.~~		**HSS**
~~(105) Los Padres Reservoir (Monterey Co.).~~	~~Last Saturday in Apr. through Nov. 15. No rainbow trout less than 10 inches or greater than 16 inches total length may be kept. Only artificial lures with barbless hooks may be used.~~	~~5 trout, no more than 2 of which may be rainbow trout.~~	**HSS**
(82) Lundy Lake (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(83) Lytle Creek and tributaries upstream of Interstate 15 bridge. (San Bernardino Co.).	All year.	5 trout	**A1**
(~~106~~84) Macklin Creek (Nevada Co.), arising near Milton-Bowman Tunnel alignment, flowing north-westerly and having its junction with the Middle Fork Yuba River about 2 1/4 miles downstream from Milton Reservoir.	Closed to all fishing all year.		**J**
~~(107) Mad River and tributaries (Humboldt Co.).~~			
~~(A) Mad River from the mouth to 200 yards upstream.~~	~~Jan. 1 through Mar. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	**Menu option**
		~~steelhead** in possession.~~	
~~(B) Mad River main stem, from 200 yards above its mouth upstream to the confluence with Cowan Creek, excluding tributaries. Also see Low-Flow Restrictions, Section 8.00(a)(4).~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(C) Mad River main stem, from the confluence with Cowan Creek to the confluence with Deer Creek, excluding tributaries.~~	~~Closed to all fishing all year.~~		**HSS**
~~(D) Mad River main stem from the confluence with Deer Creek to Ruth Dam.~~	~~Fourth Saturday in May through Oct. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(E) Mad River and tributaries above Ruth Dam.~~	~~Last Saturday in May through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~	**SR**
(85) Mamie Lake (Lake Mamie, Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(~~109~~86) Mammoth Pool (Fresno and Madera ~~Cos.~~cos.).	~~June 16 through Apr. 30.~~All year.	5 trout ~~per day. 10 trout in possession.~~	**A1**
~~(110) Mammoth Pool tributaries (Fresno and Madera Cos.~~cos.~~) from their mouths to a point 300 feet upstream.~~	~~June 16 through Nov. 15~~	~~5 trout per day. 10 trout in possession.~~	**SR**
(~~111~~87) Martis Creek from the Martis Lake dam downstream to the confluence with the Truckee River (Nevada Co.).	~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used.~~All year. Only artificial lures with barbless hooks may be used.	~~2 trout~~ 0 trout	**A6**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~112~~88) Martis Lake ~~and~~ tributaries (Nevada and Placer ~~Cos.~~cos.).	All year. Only artificial lures with barbless hooks may be used.	0 trout	
~~(A) Martis Lake.~~	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used~~	~~0 trout~~	**SL**
~~(B) Martis Lake tributaries~~.	~~Closed to all fishing all year~~		**A6**
(89) Mary Lake (Lake Mary, Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
~~(113) Mattole River (Humboldt Co.). Also see Section 8.00(a).~~			
~~(A) Mattole River main stem from the mouth to 200 yards upstream.~~	~~Closed to all fishing all year.~~		**HSS**
~~(B) Mattole River main stem from 200 yards upstream of mouth to confluence with Stansberry Creek.~~	~~Jan. 1 through Mar. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(C) Mattole River main stem from confluence with Stansberry Creek to confluence with Honeydew Creek.~~	~~Jan. 1 through Mar. 31 and Fourth Saturday in May through Aug. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~115~~90) McCloud River and tributaries (Shasta and Siskiyou ~~Cos.~~cos.).	~~Also see Sierra District General Regulations Section 7.00(b)).~~		
(A) Moosehead Creek and all tributaries.	Closed to all fishing all year.		**J**
~~(B) McKay Creek and all tributaries including Sheepheaven Spring.~~	~~Closed to all fishing all year.~~		**Del14**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~C~~B) Edson Creek ~~and all tributaries, excluding Dry Creek~~.	Closed to all fishing all year.		**J**
(~~D~~C) Swamp Creek and all tributaries.	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures with barbless hooks may be used.	0 trout	**G6**
(D) Sheephaven Creek.	Closed to all fishing all year.		**J**
(E) Bull Creek and tributaries.	Closed to all fishing all year.		**J**
(F) Dry Creek south of upper McCloud River.	Closed to all fishing all year.		**J**
(~~E~~G) McCloud River from McCloud Dam downstream to confluence of Ladybug Creek.	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures may be used.	2 trout	**F3**
	Oct.~~ober~~ 1 through the Fri.~~day~~ preceding Memorial Day. Only artificial lures with barbless hooks may be used.	0 trout	**I6**
(~~F~~H) McCloud River from confluence of Ladybug Creek downstream to ~~lower boundary of the U.S. Forest Service loop (southern boundary of Section 36, T38N, R3W).~~Shasta Lake.	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
~~(G) McCloud River from the lower boundary of the U.S. Forest Service loop (southern boundary of Section 36, T38N, R3W) downstream to the upper boundary of the McCloud~~	~~Closed to all fishing all year.~~		**Del15**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~River Club (southern boundary of Section 14, T37N, R3W).~~			
~~(115.2) McDonald Creek (Humboldt Co.).~~	~~Closed to fishing all year.~~		**HSS**
(~~115.3~~91) McGee Creek (Mono Co.).			
~~(A)~~ McGee Creek downstream from Highway 395.	~~Last Saturday in April through Friday preceding Memorial Day and Oct. 1 through Nov. 15. Minimum size limit: 18 inches total length. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	~~2 trout~~5 trout	**F1**
	~~Saturday preceding Memorial Day through Sept. 30.~~	~~5 trout per day. 10 trout in possession.~~	**Del16**
~~(B) McGee Creek upstream from Highway 395.~~	~~Last Saturday in April through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~	**SR**
~~(115.4) McKay Creek and all tributaries (Siskiyou Co.)~~	~~See McCloud River 7.50(b)(115).~~		**Del17**
(~~115.6~~92) McLeod Lake (Mono Co.).	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
(~~115.8~~93) Meiss Lake (Alpine Co.).	~~Closed to all fishing all year~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	0 trout	**F6**
~~(116) Mendocino Lake tributaries (Mendocino Co.).~~	~~Last Saturday in Apr. through Nov. 15~~	~~5 trout~~	**SL**
~~(117) Merced River (Mariposa Co.).~~			

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~(A) From the Happy Isles footbridge downstream to the western boundary of Yosemite National Park at El Portal.~~	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~0 rainbow trout. 5 brown trout per day. 10 brown trout in possession.~~	**SR**
~~(B) From the western boundary of Yosemite National Park at El Portal boundary downstream to the Foresta bridge.~~	~~All year. Only artificial lures with barbless hooks may be used.~~	~~0 rainbow trout. 5 brown trout per day. 10 brown trout in possession.~~	**SR**
~~(C) From Foresta bridge downstream to Lake McClure.~~	~~Last Saturday in April through November 15. November 16 through the Friday preceding the last Saturday in April.~~	~~5 trout per day. 10 trout in possession.~~	**SR**
~~(118) Merced River (Merced Co.).~~			
~~(A) From Crocker-Huffman Dam downstream to the Schaffer bridge on Oakdale Road.~~	~~Jan. 1 through Oct. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From the Schaffer bridge on Oakdale Road downstream to the mouth.~~	~~Jan. 1 through Oct. 31. Bait may be used from Jan. 1 through Oct. 31. However, from April 1 through the Friday preceding the fourth Saturday in May, bait may be used only with single hooks having a gap between 1/2 and 1 inch, or with multiple hooks having a gap between 1/4 and 1/2 inch.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~118.2~~94) Milk Ranch Creek and tributaries (Alpine Co.) above the confluence with the North Fork Mokelumne River.	Closed to all fishing all year.		**J**
(~~118.5~~95) Mill Creek (Mono Co. tributary to West Walker River) and tributaries upstream from	~~Closed to all fishing all year~~ All year. Only artificial flies with barbless hooks may be used.	0 trout	**A7**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
confluence with Lost Cannon Creek.			
~~(119) Mill Creek (Tehama Co.).~~			
~~(A) From the Lassen National Park boundary downstream to the U.S. Geological Survey gauging station cable crossing at the mouth of Mill Creek Canyon.~~	~~Last Saturday in April through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From U.S. Geological Survey gauging station cable crossing at mouth of Mill Creek Canyon downstream to the mouth of Mill Creek.~~	~~June 16 through Sept. 30.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(96) Miller Canyon Creek from Silverwood Lake upstream (San Bernardino Co.)	All year.	5 trout	**A1**
(~~120~~97) Milton Lake and Middle Fork Yuba River between Milton Lake and Jackson Meadows Dam (Nevada and Sierra ~~Cos.~~cos.).	~~Last Saturday in Apr. through Nov. 15. Maximum size limit: 12 inches total length. Only artificial lures with barbless hooks may be used~~ All year. Only artificial lures with barbless hooks may be used.	~~2 trout~~ 0 trout	**A6**
(~~122~~98) Mitchell Creek and tributaries (Contra Costa Co.).	Closed to all fishing all year.		**HSS**
~~(124) Mokelumne River (San Joaquin Co.).~~			
~~(A) From Camanche Dam to Elliot Road.~~	~~Jan. 1 through Mar. 31.~~	~~1 hatchery trout or hatchery steelhead**~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
	~~Fourth Saturday in in May through July 15.~~	~~1 hatchery trout or hatchery steelhead**~~	
	~~July 16 through Oct. 15.~~	~~1 hatchery trout or hatchery steelhead**. 2 Chinook salmon.~~	
~~(B) From Elliot Road to the Woodbridge Irrigation District Dam including Lodi Lake.~~	~~Jan. 1 through July 15.~~	~~1 hatchery trout or hatchery steelhead**~~	**HSS**
	~~July 16 through Dec. 31.~~	~~1 hatchery trout or hatchery steelhead**. 2 Chinook salmon.~~	
~~(C) Between the Woodbridge Irrigation District Dam and the Lower Sacramento Road bridge.~~	~~Closed to all fishing all year~~		**HSS**
~~(D) From the Lower Sacramento Road bridge to the mouth. For purposes of this regulation, this river segment is defined as Mokelumne River and its tributary sloughs downstream of the Lower Sacramento Road bridge and east of Highway 160 and north of Highway 12.~~	~~Jan. 1 through July 15.~~	~~1 hatchery trout or hatchery steelhead**~~	**HSS**
	~~July 16 through Dec. 16.~~	~~1 hatchery trout or hatchery steelhead**. 2 Chinook salmon.~~	
	~~Dec. 17 through Dec. 31.~~	~~1 hatchery trout or hatchery steelhead**~~	
(~~125~~99) Mono Creek (Fresno Co.) and tributaries from Edison Lake upstream to the confluence with the North Fork Mono Creek.	~~June 1 through October 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout ~~per day. 10 trout in possession.~~	**F1**
~~(125.5) Moosehead Creek and tributaries (Shasta and Siskiyou cos.).~~	~~See McCloud River 7.50(b)(115).~~		**Del18**
(~~126~~100) Murray Canyon Creek and tributaries (Alpine Co.) upstream	Closed to all fishing all year.		**J**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
from the falls located about 1/4 mile above the confluence with the East Fork Carson River.			
~~(128) Nacimiento River (Monterey and San Luis Obispo Cos.)~~			
~~(A) From the headwaters in the Los Padres National Forest, downstream to the southern border of Fort Hunter-Liggett Military Reservation.~~	~~Last Saturday in Apr. through Nov. 15~~	~~5 trout~~	**SR**
~~(B) Nacimiento Lake, and the main stem Nacimiento River upstream to the southern boundary of Fort Hunter-Liggett.~~	~~All year.~~	~~5 trout~~	**SL**
~~(C) Main stem below Nacimiento Dam, downstream to its confluence with the Salinas River.~~	~~Saturday preceding Memorial Day through October 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(129) Napa River and tributaries (Napa Co.). Also see Section 8.00(b).~~			
~~(A) Main stem above the Oakville Cross Road Bridge near Yountville and all Napa River tributaries.~~	~~Closed to all fishing all year.~~		**HSS**
~~(B) From the Oakville Cross Road Bridge near Yountville to the Trancas Bridge. Note: The Napa River below the Trancas Bridge is tidewater, and is under the regulations for the Ocean and San Francisco Bay District (see Sections 1.53 and 27.00).~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~(130) Navarro River (Mendocino Co.). Also see Low-Flow Restrictions, Section 8.00(b)(1). Main stem below the Greenwood Road bridge.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~130.5~~101) Nelson Corral Reservoir and tributary (Lassen Co.).			
(A) Nelson Corral Reservoir.	All year.	2 trout. 4 trout in possession.	**A2**
(B) Nelson Corral Reservoir tributary (the unnamed tributary entering the reservoir at the north end).	Closed to all fishing all year.		**J**
~~(130.6) New Bullards Bar Reservoir.~~	~~All year.~~	~~5 trout. 10 landlocked salmon per day. 20 landlocked salmon in possession.~~	**SL**
(~~131~~102) Newlands Lake tributaries (Lassen Co.).	Closed to all fishing all year.		**J**
(~~132~~103) Nicasio Lake tributaries (Marin Co.).	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	~~5 trout~~ 2 trout. 4 trout in possession.	**F2**
~~(133) Noyo River (Mendocino Co.). Also see Low-Flow Restrictions, Section 8.00(b)(1).~~			
~~(A) Noyo River main stem from the mouth to the Georgia-Pacific logging road bridge one mile east of Highway 1.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~(B) Noyo River main stem from the Georgia-Pacific logging road bridge one mile east of Highway 1 to the confluence with the South Fork Noyo River.~~	~~Fourth Saturday in May through Oct. 1. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead** 4 hatchery trout or hatchery steelhead** in possession~~	**HSS**
~~(C) Noyo River main stem from the confluence with the South Fork Noyo River to the Sonoma/Mendicino Boy Scout Council Camp.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~134~~104) Owens River (Inyo and Mono Cos.), ~~including Pleasant Valley and Tinemaha lakes,~~ except (A), (B), (C), and (D) ~~and (E)~~ below.	~~First Saturday in Mar. through Oct. 31.~~All year.	5 trout ~~per day. 10 trout in possession.~~	**A1**
	~~Nov. 1 through the Friday preceding the first Saturday in Mar.~~	~~5 trout~~	**SR**
(A) Upper Owens River from Benton Bridge road crossing upstream to Big Springs. Above Big Springs, see Deadman Creek 7.50(b)(41).	~~Last Saturday in April through Nov. 15. Maximum size limit: 16 inches total length. Only artificial lures with barbless hooks may be used.~~All year. Only artificial lures with barbless hooks may be used.	~~2 trout~~ 0 trout	**A6**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
(B) Upper Owens River from Benton Bridge road crossing ~~downstream to upper Owens River fishing monument.~~ to Crowley Lake.	~~Saturday preceding Memorial Day through Sep. 30.~~Last Sat.~~urday~~ in Apr.~~il~~ through Jul.~~y~~ 31.	5 trout ~~per day. 10 trout in possession.~~	**D1**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
	Aug.~~ust~~ 1 through Nov.~~ember~~ 15. Only artificial lures may be used. Minimum size limit: 18 inches total length.	2 trout	**E5**
~~(C) Upper Owens River from fishing monument (located about 1/4 mile upstream from maximum lake level) to Crowley Lake.~~	~~Last Saturday in April through July 31. Aug. 1 through Nov. 15. Minimum size limit: 18 inches total length. Only artificial lures with barbless hooks may be used.~~	~~5 trout per day. 10 trout in possession. 2 trout~~	**Del19**
(~~D~~C) From Pleasant Valley Dam downstream to footbridge at lower end of Pleasant Valley Campground.	~~Jan. 1 through Sept. 30.~~ Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	2 trout. 4 trout in possession.	**B2**
	~~Oct. 1 through Dec. 31. Only artificial lures with barbless hooks may be used.~~ Nov.~~ember~~ 16 through the Fri.~~day~~ preceding the last Sat.~~urday~~ in Apr.~~il~~. Only artificial lures with barbless hooks may be used.	0 trout	**C6**
(~~E~~D) From footbridge at lower end of Pleasant Valley Campground east (downstream) ~~3.3 miles along Chalk Bluffs Road to the redwood sport fishing regulations sign.~~ to 5 Bridges Road.	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
~~(135) Pajaro River (Monterey, Santa Clara, Santa Cruz and San Benito Cos.) from mouth to Uvas Creek. Also see Low-Flow Restrictions, Section 8.00(c)(5).~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(135.4) Lake Pardee.~~	~~All year.~~	~~5 trout. 10 landlocked salmon per day. 20 landlocked salmon in possession.~~	**SL**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~135.5~~105) Parker Creek (Mono Co.)~~. from the Lee Vining Conduit to Rush Creek.~~ from Parker Lake to the confluence with Rush Creek.	~~Last Saturday in Apr. though Nov. 15. Only artificial lures with barbless hooks may be used~~ All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
~~(135.8) Upper Penitencia Creek (Santa Clara Co.) a tributary to Coyote Ck. Also see Section 8.00(c).~~	~~Closed to all fishing all year~~		**HSS**
~~(136) Pescadero Creek (San Mateo Co.) from mouth to the Stage Road bridge at Pescadero. Also see Low-Flow Restrictions, Section 8.00(c)(2).~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless . hooks may be used~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(137) Pescadero Creek tributaries and main stem above the Stage Road bridge at Pescadero (Santa Clara and San Mateo Cos.).~~	~~Closed to all fishing all year.~~		**HSS**
~~(138) Pillsbury Lake tributaries (Lake Co.).~~	~~Last Saturday in Apr. 5 through Nov. 15.~~	~~5 trout~~	**Del20**
~~(139) Pine Creek and Pine Creek Slough (Lassen Co.) See Eagle Lake 7.50(b)(61).~~			**Del21**
~~(A) Pine Creek Slough and Pine Creek below State Highway 44.~~	~~Closed to fishing all year.~~		
~~(B) Pine Creek above State Highway 44.~~	~~Saturday preceding Memorial Day through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~	
(~~139.5~~106) Pine Creek (Goose Lake Tributary) and tributaries (Modoc Co.).	~~Saturday preceding Memorial Day through November 15. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~.	~~0 trout~~5 trout	**G1**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(107) Pine Valley Creek (San Diego Co.) upstream of Barrett Lake and all its tributaries.	All year. Only artificial lures may be used.	2 trout	**A3**
~~(139.7) Pinole Creek (Contra Costa Co.) and tributaries.~~	~~Closed to all fishing all year~~		**HSS**
(~~140~~108) Piru Creek (Los Angeles and Ventura ~~Cos.~~cos.).			
(A) Piru Creek and tributaries upstream of Pyramid Lake.	All year. Only artificial lures may be used.	2 trout	**A3**
(B) From Pyramid Dam downstream to the bridge approximately 300 yards below Pyramid Lake.	Closed to all fishing all year.		**J**
(C) From the bridge approximately 300 yards below Pyramid Lake downstream to the falls about above the old Highway 99 bridge.	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
(~~141~~109) Pit River (Shasta and Modoc cos.).			
~~(A) Pit River (Modoc Co.) from the Hwy 395 bridge/South Fork Pit River crossing near the town of Likely downstream to the Highway 299 (Canby) bridge/Pit River crossing.~~	~~All year.~~	~~0 trout~~	**SR**
(A) Pit River, South Fork (Modoc Co.) and tributaries upstream of the Highway 395 bridge in Likely.	Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~.	5 trout	**G1**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(B) Pit River, North Fork (Modoc Co.) and tributaries from the confluence with the South Fork in Alturas upstream to (including) Franklin Creek.	Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures may be used.	2 trout	**G3**
(~~B~~C) From Pit No. 3 (Britton Dam) downstream to the outlet of the Pit No. 3 Powerhouse.	~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 18 inches total length.~~ All year. Only artificial lures with barbless hooks may be used.	~~2 trout~~ 0 trout	**A6**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
(~~C~~D) Pit River, from Pit No. 3 Powerhouse downstream to ~~Pit No. 7 dam~~Shasta Lake.	~~Last Saturday in Apr. through Nov. 15.~~ All year.	~~5 trout~~ 2 trout. 4 trout in possession.	**A2**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0~~	
~~(D) From Pit No. 7 dam downstream to Shasta Lake.~~	~~All year~~	~~5~~	**Del22**
(~~143~~110) Pole Creek and tributaries (Placer Co.)	Closed to all fishing all year.		**J**
(~~144~~111) Portuguese Creek, West Fork (Madera Co.) from headwaters downstream to confluence with the East Fork Portuguese Creek.	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures with barbless hooks may be used.	0 trout	**G6**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(~~145~~112) Prosser Creek from the Prosser Reservoir dam downstream to the confluence with the Truckee River (Nevada Co.)	~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used.~~ All year. Only artificial lures with barbless hooks may be used.	~~2 trout.~~0 trout	**A6**
(~~146~~113) Purisima Creek (San Mateo Co.).	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	~~5 trout~~0 trout	**F6**
(~~147~~114) Putah Creek (Solano and Yolo ~~Cos.~~cos.) ~~from~~ Solano Lake to Monticello Dam.	All year. Only artificial lures ~~and~~with barbless hooks may be used.	0 trout	**A6**
(~~148~~115) Redwood Creek and tributaries (Alameda Co.).	Closed to all fishing all year.		**J**
~~(149) Redwood Creek and tidewaters (Marin Co.)~~	~~Closed to all fishing all year~~		**HSS**
(~~150~~116) Redwood Creek (Humboldt Co.). ~~Also see Section 8.00(a).~~ and tributaries above the mouth of Bond Creek.	Closed to all fishing all year.		**J**
~~(A) Redwood Creek main stem, within a radius of 200 yards of its mouth.~~	~~Jan. 1 through Mar. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) Redwood Creek main stem, from 200 yards above the mouth to the mouth of Prairie Creek.~~	~~Fourth Saturday in May through Mar. 31. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(C) Redwood Creek main stem, from the mouth of~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures~~	~~2 hatchery trout or hatchery~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~Prairie Creek to the mouth of Bond Creek.~~	~~with barbless hooks may be used.~~	~~steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	
~~(D) Redwood Creek and tributaries, above the mouth of Bond Creek.~~	~~Closed to all fishing all year.~~		**HSS**
(~~150.5~~117) Robinson Creek (Mono Co.).			
(A) From the U.S. Forest Service boundary downstream to Upper Twin Lake.	~~Last Saturday in April through Sept. 14~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout	**F1**
	~~Sept. 15 through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~0 trout.~~	
(B) Between Upper and Lower Twin Lakes.	~~Last Saturday in April through Sept. 14.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout	**F1**
(~~151~~118) Rock Creek Diversion Channel (Mono Co.)~~. Rock Creek Diversion Channel~~ from its source below Tom's Place to its confluence with Crooked Creek.	Closed to all fishing all year.		**J**
(119) Rock Creek Lake (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(~~151.5~~120) Rock Creek in the Hat Creek Drainage (Shasta Co.) from Rock Creek spring (origin) downstream to Baum Lake.	Closed to all fishing all year.		**J**
(~~152~~121) Rock Creek (Shasta Co.) from its confluence with Pit River	Closed to all fishing all year.		**J**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
to Rock Creek Falls (about one mile upstream).			
(~~152.5~~122) Roosevelt Lake (Mono Co.).	~~Last Saturday in Apr. through Nov. 15.~~All year. Only artificial lures may be used.	2 trout	**A3**
~~(153~~123) Rush Creek (Mono Co.)			
(A) only from Grant Lake Dam downstream to Mono Lake.	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used~~ All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
(B) Rush Creek (Mono Co.) between Silver Lake and Grant Lake	Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout	**F1**
~~(154) Russian Gulch and tributaries (Sonoma Co.). Main stem below the confluence of the East Branch. Also see Section 8.00(b).~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(155) Russian River and tributaries (Sonoma and Mendocino Cos.). Also see Section 8.00(b).~~			
~~(A) Russian River main stem below the confluence of the East Branch Russian River. (See also Mendocino Lake tributaries (7.50(b)(116)).~~	~~All Year. Only artificial lures with barbless hooks may be used from Apr. 1 through Oct. 31 Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) Russian River main stem above the confluence of the East Branch and all River tributaries. (See Laguna de Santa Rosa 7.50(b)(93)~~	~~Closed to all fishing all year.~~		**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~and Santa Rosa Creek 7.50(b)(172) for non-salmonids only.)~~			
~~(C) Russian River within 250 feet of the Healdsburg Memorial Dam.~~	~~Closed to all fishing all year.~~		**HSS**
(124) Sabrina Lake (Lake Sabrina, Inyo Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(~~156~~125) Sacramento River and tributaries. above Keswick Dam (Shasta and Siskiyou Cos.cos.).	~~Also see Sierra District General Regulations (See Section 7.00(b)).~~		
(A) Sacramento River and tributaries from Box Canyon Dam downstream to the Scarlett Way bridge in Dunsmuir.	All Year. Only artificial lures with barbless hooks may be used.	0 trout	**HSS**
(B) Sacramento River and tributaries ~~excluding Soda Creek~~ from Scarlett Way bridge downstream to the county bridge at Sweetbriar ~~(See Soda Creek 7.50(b)(180.5))~~.	~~Last Saturday in Apr. through Nov. 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout ~~per day. 10 trout in possession.~~	**F1**
	Oct.~~ober~~ 1 through the Fri.~~day~~ preceding Memorial Day. Only artificial lures may be used.	2 trout	**I3**
(C) Sacramento River ~~mainstem (excluding tributaries)~~ and tributaries from the ~~Scarlett Way bridge downstream to the~~ county bridge at Sweetbriar downstream to Shasta Lake.	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~All year. Only artificial lures may be used.	~~0 trout~~2 trout	**A3**
~~(D) Sacramento River and tributaries excluding Castle Creek from the county bridge at~~	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~2 trout~~	**Del23**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~Sweetbriar downstream to Shasta Lake (See Castle Creek 7.50(b)(39.3)).~~			
~~(E) Sacramento River mainstem (excluding all tributaries) from the county bridge at Sweetbriar downstream to Shasta Lake.~~	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	**HSS**
~~(156.5) Sacramento River and tributaries below Keswick Dam (Butte, Colusa, Contra Costa, Glenn, Sacramento, Shasta, Solano, Sutter, Tehama and Yolo Cos.).~~	~~Also see Sierra District General Regulations (See Section 7.00(b)).~~		**HSS**
~~(A) Sacramento River from Keswick Dam to 650 feet below Keswick Dam.~~	~~Closed to all fishing all year.~~		**HSS**
~~(B) Sacramento River from 650 feet below Keswick Dam to the Deschutes Road bridge.~~			**HSS**
~~1. Sacramento River from 650 feet below Keswick Dam to the Highway 44 bridge.~~	~~Jan. 1 to Mar. 31. Only barbless hooks may be used. Closed to all fishing from Apr. 1 through July 31. Aug. 1 to Dec. 31. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~2. Sacramento River from the Highway 44 bridge to the Deschutes Road bridge.~~	~~All year. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	**Menu option**
		~~steelhead** in possession.~~	
~~(C) Sacramento River from the Deschutes Road bridge to the Red Bluff Diversion Dam.~~	~~Jan. 1 through July 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~Aug. 1 through Dec. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 Chinook Salmon. 4 Chinook Salmon in possession.~~	
~~(D) Sacramento River from the Red Bluff Diversion Dam to the Hwy 113 bridge near Knights Landing.~~	~~Jan. 1 through July 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~July 16 through Dec. 16.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 1 Chinook Salmon. 2 Chinook Salmon in possession.~~	
	~~Dec. 17 through Dec. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	**Menu option**
~~(E) Sacramento River from the Hwy 113 bridge near Knights Landing to the Carquinez Bridge (includes Suisun Bay, Grizzly Bay and all tributary sloughs west of Highway 160).~~	~~Jan. 1 through July 15.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
	~~July 16 through Dec. 16.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 1 Chinook Salmon. 2 Chinook Salmon in possession.~~	
	~~Dec. 17 through Dec. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	
(~~157~~126) Sagehen Creek (Nevada Co.).			
(A) From the stream gauging station (located about 1/8 ~~one-eighth~~ mile below Sagehen Creek Station Headquarters) upstream to about 1/8 ~~one-eighth~~ of a mile above the station headquarters at a point where the stream splits into two sections.	Closed to all fishing all year.		**J**
(B) From the Highway 89 bridge upstream to the gauging station at the east boundary of the Sagehen Creek Station.	~~Last Saturday in Apr. through Nov. 15 Only artificial lures with barbless hooks may be used~~ All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	**Menu option**
~~(158) Salinas River and tributaries (Monterey and San Luis Obispo Cos.). Also see Section 8.00(c).~~			
~~(A) The main stem Salinas River.~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun.,Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) All Salinas River tributaries upstream of Arroyo Seco River confluence (including the San Antonio River below San Antonio Reservoir and Dam, Paso Robles Creek and tributaries, Atascadero Creek, Santa Margarita Creek and tributaries but excluding the Nacimiento River) See 7.50(b)(128).~~	~~Last Saturday in Apr. through Nov. 15. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(159) Salmon Creek and tributaries (Sonoma Co.). Also see Section 8.00(b).~~			
~~(A) Salmon Creek main stem below Highway 1.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) Salmon Creek main stem above Highway 1 and all Salmon Creek tributaries.~~	~~Closed to all fishing all year~~		**HSS**
(~~160~~127) Salmon Creek and tributaries above Highway 1 (Monterey Co.).	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	~~5 trout~~0 trout	**F6**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~(161) Salmon River (Siskiyou Co.)~~	~~See Klamath River 7.50(b)(91.1).~~		**HSS**
~~(163) San Benito River and tributaries (San Benito Co.).~~	~~Last Saturday in Apr. through Nov. 15~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(164) San Clemente Creek and tributaries (Monterey Co.) except for Trout Lake.~~	~~Last Saturday in Apr. through Nov. 15 Only artificial lures with barbless hooks may be used~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(165.2) San Diego Creek (Orange Co.). Downstream of the MacArthur Blvd. bridge only.~~	~~Saturday preceding Memorial Day through Nov. 30.Only artificial lures with barbless hooks may be used.~~	~~Open to fishing for non- salmonids only. Closed to the take of trout, and steelhead.~~	**HSS**
~~(166) San Francisquito Creek and tributaries (Santa Clara and San Mateo Cos.)~~	~~Closed to all fishing all year~~		**HSS**
(~~167~~128) San Gabriel River, West Fork and tributaries (Los Angeles Co.).			
(A) Upstream of Cogswell Dam (including Cogswell Reservoir and its tributaries).	All year. Only artificial lures may be used.	2 trout	**A3**
(B) From Cogswell Dam downstream to the second bridge upstream from the Highway 39 bridge.	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
~~(167.2) San Gabriel River (Los Angeles and Orange Cos.) Upstream of the Highway 22 bridge to the start of concrete-lined~~	~~Saturday preceding Memorial Day through Nov. 30. Only artificial lures with barbless hooks may be used.~~	~~Open to fishing for non- salmonids only. Closed to the take of trout, and steelhead.~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	**Menu option**
~~portion of the river channel.~~			
~~(168) San Gregorio Creek (San Mateo Co.) from the mouth to the Stage Road bridge at San Gregorio. Also see Low-Flow Restrictions, Section 8.00(c)(2).~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(168.5) San Joaquin River (Fresno, Madera, Merced, San Joaquin, and Stanislaus Cos.).~~			
~~(A) From Friant Dam downstream to the Highway 140 bridge.~~	~~All year.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From the Highway 140 bridge downstream to the Interstate 5 bridge at Mossdale.~~	~~All year.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(168.6) San Juan Creek main stem (Orange Co.).~~	~~Closed to all fishing all year.~~		**HSS**
~~(169) San Lorenzo River (Santa Cruz Co.) from the mouth to the Lomond Street bridge in the town of Boulder Creek. Also see Section 8.00(c).~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun.,Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(170) San Luis Obispo Creek (San Luis Obispo Co.) from mouth to the first and most southwestern highway 1/101 bridge.~~	~~Dec. 1 through Mar. 7, but only Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~(170.1) San Luis Rey River (San Diego Co.).~~	~~Closed to all fishing all year.~~		**HSS**
(129) San Luis Rey River West Fork (San Diego Co.).	All year. Only artificial lures may be used.	2 trout	**A3**
~~(170.5) San Mateo Creek and tributaries downstream from the falls between the Tenaja Road crossing and Fisherman's Camp (San Diego and Riverside cos.).~~	~~Closed to all fishing all year.~~		**HSS**
~~(171) San Simeon Creek (San Luis Obispo Co.) from mouth to the pedestrian bridge in San Simeon Beach State Park.~~	~~Dec. 1 through Mar. 7, but only Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(130) Santa Ana River and tributaries upstream above Seven Oaks Dam. (San Bernardino Co.~~unty~~). This does not include Bear Creek. See Subsection 7.50(b)(8), Bear Creek (San Bernardino Co.) for additional info.	All year.	5 trout	**A1**
~~(171.6) Santa Margarita River and tributaries downstream from the Interstate 15 bridge (San Diego and Riverside cos.).~~	~~Closed to all fishing all year.~~		**HSS**
~~(171.7) Santa Paula Creek and tributaries above the falls located 3 miles upstream from the Highway 150 bridge (Ventura Co.).~~	~~All year.~~	~~5 trout~~	**SR**
~~(172) Santa Rosa Creek (Sonoma Co. tributary to Russian River) from~~	~~Last Saturday in Apr. through Nov. 15.~~	~~Open to fishing for non- salmonids only. Closed to the~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~Laguna de Santa Rosa to Highway 12 bridge.~~		~~take of trout, and steelhead.~~	
~~(172.3) Santa Ynez River and tributaries downstream from Bradbury Dam (Santa Barbara Co.).~~	~~Closed to all fishing all year.~~		**HSS**
(~~172.5~~131) Santa Ynez River and tributaries upstream of Gibraltar Dam (Santa Barbara Co.).	All year.	2 trout. 4 trout in possession.	**A2**
(~~172.7~~132) Sausal Creek and tributaries (Alameda Co.).	Closed to all fishing all year.		**J**
~~(173) Scott Creek (Santa Cruz Co.) from mouth to confluence with Big Creek. Also see Low-Flow Restrictions, Section 8.00(c)(3).~~	~~Dec. 1 through Mar. 7, but only Sat., Sun.,Wed., legal holidays and opening and closing days. Only barbless hooks may be used~~	~~0 trout~~	**HSS**
~~(174) Scott River (Siskiyou Co.).~~	~~See Klamath River 7.50(b)(91.1).~~		**HSS**
~~(174.1) Scotts Flat Reservoir, upper~~	~~All year.~~	~~5 trout per day. 10 trout in possession. 10 landlocked salmon per day. 20 landlocked salmon in possession.~~	**SL**
~~(174.3) See Canyon Creek (San Luis Obispo Co.).~~	~~Closed to all fishing all year.~~		**HSS**
(~~174.5~~133) Sespe Creek and tributaries above Alder Creek confluence. (Ventura Co.).	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
~~(175) Shasta Lake (Shasta Co.).~~	~~All year~~	~~5 trout~~	**SL**
~~(176) Shasta River (Siskyou Co.).~~	~~See Klamath River 7.50(b)(91.1).~~		**HSS**
~~(176.5) Sheepheaven Spring (Siskiyou Co.).~~	~~See McCloud River 7.50(b)(115).~~		**Del24**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~(177) Shovel Creek and tributaries (Siskiyou Co.).~~	~~See Klamath River 7.50(b)(91).~~		**Del25**
(~~177.2~~134) Silver Creek (Mono Co.), tributary to West Walker River, and tributaries upstream from Silver Falls.	Closed to all fishing all year.		**J**
(~~177.5~~135) Silver Creek ~~between Sworinger Lake and Lost Lake~~ and all other tributaries to Sworinger Lake (Modoc and Lassen ~~Cos.~~cos.).	~~Closed to all fishing all year~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures may be used.	2 trout	**G3**
(~~178~~136) Silver King Creek and tributaries (Alpine Co.) upstream of the confluence with Snodgrass Creek.	Closed to all fishing all year.		**J**
(137) Silver Lake (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
~~(178.5) Sisquoc River and tributaries (Santa Barbara Co.).~~	~~Closed to all fishing all year.~~		**HSS**
(~~179~~138) Slinkard Creek and tributaries (Mono Co.) upstream from a ~~D~~department ~~of Fish and Game cable crossing located about 2.7 miles south of a point on Highway 89 two miles west of its junction with Highway 395 (the cable is located about 600 feet below a rock dam on Clinkard Creek within the south half of Section 21, T9N, R22E).~~Wildlife rock gabbion barrier (38.606976°N, 119.567687°W). The barrier is located approximately 5-6 miles	~~Aug. 1 through Nov. 15. Only artificial flies with barbless hooks may be used.~~All year. Only artificial flies with barbless hooks may be used.	0 trout	**A7**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
upstream from the Hwy 89 and 395 junction.			
~~(180) Smith River (Del Norte Co.) Yearly limits apply for entire river.~~	~~Low-Flow Restrictions, Section 8.00, also apply, see below for more detail.~~		
~~(A) Main stem from the mouth to confluence of Middle and South forks. Also see Low-Flow Restrictions, Section 8.00(a)(7).~~	~~Fourth Saturday in May through Apr. 30. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Aug. 31. Only barbless hooks may be used from Sep. 1 through Apr. 30.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 cutthroat trout minimum size limit: 10 inches total length. 1 Chinook Salmon and no more than 5 wild Chinook Salmon* over 22 inches per year.~~	**HSS**
~~(B) Middle Fork Smith River~~			
~~1. from mouth to Patrick Creek Also see Low-Flow Restrictions, Section 8.00(a)(7).~~	~~Fourth Saturday in May through Apr. 30. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Aug. 31. Only barbless hooks may be used from Sep. 1 through Apr. 30.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 cutthroat trout minimum size limit: 10 inches total length. 1 Chinook Salmon and no more than 5 wild Chinook salmon* over 22 inches per year.~~	**HSS**
~~2. above the mouth of Patrick Creek. Also see Low-Flow Restrictions, Section 8.00(a)(7).~~	~~Fourth Saturday in May through Oct. 31. Only artificial lures with barbless hooks may be used.~~	~~2 cutthroat trout minimum size limit: 10 inches total length. 2 hatchery trout or hatchery~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
		~~steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	
~~(C) South Fork Smith River~~			
~~1. from the mouth upstream approximately 1,000 feet to the County Road (George Tryon) bridge and Craigs Creek to Jones Creek. Also see Low-Flow Restrictions, Section 8.00(a)(7).~~	~~Fourth Saturday in May through Apr. 30. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Aug. 31. Only barbless hooks may be used from Sep. 1 through Apr. 30.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession. 2 cutthroat trout minimum size limit: 10 inches total length. 1 Chinook salmon and no more than 5 wild Chinook salmon* over 22 inches per year.~~	**HSS**
~~2. from the George Tryon bridge upstream to the mouth of Craigs Creek. Also see Low-Flow Restrictons, Section 8.00(a)(7).~~	~~Closed to fishing all year.~~		**HSS**
~~3. above the mouth of Jones Creek. Also see Low-Flow Restrictions, Section 8.00(a)(7).~~	~~Fourth Saturday in May through Oct. 31. Only artificial lures with barbless hooks may be used.~~	~~2 cutthroat trout minimum size limit: 10 inches total length. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(D) North Fork Smith River.~~			
~~1. from the mouth to Stony Creek. Also see Low-Flow~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be~~	~~2 hatchery trout or hatchery steelhead**. 4~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~Restrictions, Section 8.00(a)(7).~~	~~used from the fourth Saturday in May through Aug. 31. Only barbless hooks may be used from Sep. 1 through Mar. 31.~~	~~hatchery trout or hatchery steelhead** in possession. 2 cutthroat trout minimum size limit: 10 inches total length. 1 Chinook salmon and no more than 5 wild Chinook salmon* over 22 inches per year.~~	
~~2. above the mouth of Stony Creek.~~	~~Fourth Saturday in May through Oct. 31. Only artificial lures with barbless hooks may be used.~~	~~2 cutthroat trout minimum size limit: 10 inches total length. 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(180.5) Soda Creek (Shasta Co.)~~	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	**Del26**
(~~180.6~~139) Solano Lake (Solano Co.).	All year. Only artificial lures and barbless hooks may be used.	0 trout	**A6**
(~~181~~140) Sonoma Creek and tributaries (Sonoma Co.)~~.~~ ~~(A) Sonoma Creek and tributaries~~ above the Sonoma Creek seasonal waterfall in Sugarloaf Ridge State Park (located 0.2 miles upstream of the west end of the Canyon Trail).	~~Last Saturday in Apr. through Nov. 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	~~5 trout~~0 trout	**F6**
~~(B) Sonoma Creek and tributaries between the Sonoma Creek seasonal waterfall in Sugarloaf~~	~~Closed to all fishing year.~~		**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~Ridge State Park (located 0.2 miles upstream of the west end of the Canyon Trail) and the Highway 121 bridge. Note: Sonoma Creek below the Highway 121 Bridge is tidewater, and is regulated by regulations for the Ocean and San Francisco Bay District (see sections 1.53 and 27.00).~~			
(~~181.8~~141) Sonoma Lake (Sonoma Co.).	All year	2 trout. 4 trout in possession.	**A2**
(~~182~~142) Sonoma Lake tributaries (Sonoma Co.).	~~Last Saturday in April through Apr. 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures may be use.	2 trout	**F3**
(~~184~~143) Soulajoule Lake tributaries (Marin Co.).	~~Last Saturday in Apr. through Nov. 15~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	~~5 trout~~2 trout. 4 trout in possession.	**F2**
(144) South Lake (Inyo Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(~~185~~145) Squaw Valley Creek and tributaries (Shasta Co.). ~~only from the bridge crossing on U. S. Forest Service road (#39N21) located one-eighth mile upstream of the mouth of Cabin Creek (Northwest 1/4 of Section 14, T38N, R3W) downstream to an including Tom Dow Creek.~~	~~Last Saturday in Apr. through Nov. 15~~All year. Only artificial lures with barbless hooks may be used.	~~2 trout~~0 trout	**A6**
~~(186) Stanislaus River (Calaveras, San Joaquin, Stanislaus and Tuolumne Cos.).~~			

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	**Menu option**
~~(A) From Goodwin Dam down- stream to the Highway 120 bridge in Oakdale.~~	~~Jan. 1 through Oct. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From the Highway 120 bridge in Oakdale to the mouth.~~	~~Jan. 1 through Oct. 31. Bait may be used from Jan. 1 through Oct. 31. However, from April 1 through the Friday preceding the fourth Saturday in May, bait may be used only with single hooks having a gap between 1/2 and 1 inch, or with multiple hooks having a gap between 1/4 and 1/2 inch.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~187~~146) Stanislaus River, Middle Fork (Tuolumne Co.).			
(A) From Beardsley Dam downstream to the U. S. Forest Service footbridge at Spring Gap (including the Beardsley Afterbay).	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be used.~~All year. Only artificial lures may be used.	2 trout	**A3**
(B) From the U.S. Forest Service footbridge at Spring Gap to New Melones Reservoir.	~~Last Saturday in Apr. through Nov. 15~~All year.	2 trout. 4 trout in possession.	**A2**
~~(187.5) Stevens Creek (Santa Clara Co.) downstream of Stevens Reservoir.~~	~~Last Saturday in April through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(188) Stone Lagoon (Humboldt Co.).~~	~~All year. Only artificial lures with barbless hooks may be used. Cutthroat trout minimum size limit: 14 inches.~~	~~2 cutthroat trout 2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
(147) Stevens Creek and all tributaries upstream of Stevens Creek Reservoir (Santa Clara Co.).	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
(~~189~~148) Stony Creek, and tributaries (including the North, South, and Middle forks) from the headwaters downstream to the diversion dam west of Stonyford in the center of Section 35, T18N, R7W (Colusa, Glenn and Lake ~~Cos~~cos.).	All year. Only artificial lures with barbless hooks may be used.	0 trout	**A6**
~~(A) From the headwaters downstream to the diversion dam west of Stonyford in the center of Section 35, T18N, R7W, except the portion of Stony Creek Middle Fork from Red Bridge upstream.~~	~~Last Saturday in April through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~	**Del27**
	~~Nov. 16 through the Friday preceding the last Saturday in April. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
~~(B) Stony Creek Middle Fork from Red Bridge upstream.~~	~~Last Saturday in April through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~2 trout~~	**Del27**
	~~Nov. 16 through the Friday preceding the last Saturday in April. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
(~~189.5~~149) Susan River (Lassen ~~County~~Co.) ~~from the confluence of Willard Creek and the Susan River, downstream to the Bizz Johnson trail bridge located approx. 1/4 mi. downstream from the 3 mi. marker on the Bizz Johnson trail. Also, see Section 8.10 for special open season for youths~~	~~Last Saturday in April through November 15. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~.	~~0 trout~~5 trout	**G1**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~participating in Youth Fishing Derby.~~			
~~(189.8) Swamp Creek and all tributaries (Siskiyou Co.).~~	~~See McCloud River 7.50(b)(115).~~		**Del28**
(~~190~~150) Sweetwater River and tributaries ~~downstream~~ upstream of ~~from the~~ Sweetwater ~~Dam~~ Reservoir (San Diego Co.).	~~Closed to all fishing all year.~~All year. Only artificial lures may be used.	2 trout	**A3**
(~~191) Sworinger Lake tributaries (Modoc and Lassen cos.) upstream to the first lake.~~	~~Closed to all fishing all year~~.		**Del29**
(~~192~~151) Tahoe Lake and tributaries (Placer and El Dorado cos.).			
(A) Tahoe Lake tributaries upstream to the first lake.	~~July 1 through Sept. 30~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	~~5 trout per day. 10 trout in possession.~~0 trout	**F6**
~~(B) Tahoe Lake except (192)(C) below.~~	~~All year.~~	~~5 trout~~	**SL**
(~~C~~B) Tahoe Lake within 300 feet of the mouth of its tributaries.	~~July 1 through Sept. 30.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	~~5, trout but no more than 2 mackinaw trout.~~0 trout	**F6**
~~(193) Ten Mile River Mendocino Co.). Also see Section 8.00(b)(1). Ten Mile River main stem below the confluence with the Ten Mile River North Fork, and the Ten Mile River North Fork below the confluence with Bald Hill Creek.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct 31. Only barbless hooks may be used from Nov. 1 through May 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
~~(193.5) Topanga Canyon Creek and tributaries (Los Angeles Co.).~~	~~Closed to all fishing all year.~~		**HSS**
~~(194) Topaz Lake (Mono Co.).~~	~~Jan. 1 through Sept. 30~~	~~5 trout~~	**SL**
~~(194.5) Trabuco Creek (a.k.a. Arroyo Trabuco Creek) (Orange Co.). Downstream of the I-5 bridge to the confluence with San Juan Creek~~	~~Closed to all fishing all year.~~		**HSS**
~~(194.6) Trinity Reservoir.~~	~~All year.~~	~~5 trout per day. 10 trout in possession. 10 landlocked salmon per day. 20 landlocked salmon in possession.~~	**SL**
~~(195) Trinity River and tributaries downstream of Lewiston Dam.~~	~~See Klamath River 7.50(b)(91.1)~~		**HSS**
(~~195.1~~152) Trinity River, above Trinity ~~Dam~~Lake (Trinity Co.) from the confluence with Tangle Blue Creek, (Hwy. 3), downstream (south) to the mouth of Trinity Lake, approximately 13.8 miles.	~~Last Saturday in Apr. through Nov. 15.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	5 trout~~ per day.10 trout in possession.~~	**F1**
	~~Nov. 16 through the Friday preceding the last Saturday in April. Only artificial lures with barbless hooks may be used.~~ Oct.~~ober~~ 1 through the Fri.~~day~~ preceding Memorial Day. Only artificial lures with barbless hooks may be used.	0 trout	**I6**
~~(195.5) Trout Lake (Siskiyou Co.).~~	~~Only Wednesdays and weekends from the last Saturday in April through Sept.~~	~~2 trout~~	**SL**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
	~~30. Only artificial lures may be used.~~		
(~~196~~153) Truckee River (Nevada, Placer, and Sierra ~~Cos.~~cos.).			
(A) Truckee River for 1,000 feet below the Lake Tahoe outlet dam.	Closed to all fishing all year.		**J**
~~NOTE: THE AREA FROM 1,000 FEET BELOW THE LAKE TAHOE OUTLET DAM DOWNSTREAM TO TROUT CREEK IS REGULATED BY THE DISTRICT GENERAL REGULATIONS.~~			
(B) Truckee River from the confluence of Trout Creek downstream to the ~~Glenshire Bridge.~~ mouth of Prosser Creek.	~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used.~~ All year. Only artificial lures with barbless hooks may be used.	~~2 trout~~0 trout	**A6 (Option 1)**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
(B) Truckee River from the confluence of Trout Creek downstream to the ~~Glenshire Bridge.~~ mouth of Prosser Creek.	**~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used.~~ All year. Only artificial flies with barbless hooks may be used.**	**~~2 trout~~0 trout**	**(Option 2)**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	**~~0 trout~~**	
~~(C) Truckee River from the Glenshire Bridge downstream to the mouth of Prosser Creek.~~	~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 14 inches total length. Only artificial flies with barbless hooks may be used.~~	~~2 trout~~	**Del30**
	~~Nov. 16 through the Friday preceding the last Saturday in~~	~~0 trout~~	

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
	~~Apr. Only artificial flies with barbless hooks may be used.~~		
(~~D~~C) Truckee River from the mouth of Prosser Creek downstream to the Nevada State Line.	~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used.~~ All year. Only artificial lures may be used.	2 trout	**A3 (Option 1)**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
(~~D~~C) Truckee River from the mouth of Prosser Creek downstream to the Nevada State Line.	**~~Last Saturday in Apr. through Nov. 15. Minimum size limit: 14 inches total length. Only artificial lures with barbless hooks may be used.~~ All year. Only artificial lures with barbless hooks may be used.**	**~~2 trout~~ 0 trout**	**A6 (Option 2)**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	**~~0 trout~~**	
(~~197~~154) Tule River and tributaries (Tulare Co.).			
~~(A)~~ Tule River, North Fork (Tulare Co.), only in the North Fork Tule River and all its forks and tributaries above the confluence with Pine Creek (about 50 yards upstream from the Blue Ridge road bridge, about 12 1/4 miles north of Springville).	All year. Only artificial ~~flies with barbless hooks may be used~~lures may be used.	2 trout	**A3**
~~(B) All remaining portions of the Tule River and tributaries.~~	~~All year.~~	~~5 trout per day. 10 trout in possession.~~	**SR**
(~~198~~155) Tuolumne River (Stanislaus and Tuolumne	All year. Only artificial lures may be used.	2 trout	**A3**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
Cos.cos.)~~.~~ from O'Shaughnessy Dam (Hetch Hetchy Reservoir) downstream to ~~Early Intake Dam~~ Clavey River Falls.			
~~(A) From O'Shaughnessy Dam (Hetch Hetchy Reservoir) downstream to Early Intake Dam~~	~~Last Saturday in April through Nov. 15. Maximum size limit: 12 inches total length. Only artificial lures with barbless hooks may be used.~~	~~2 trout~~	**Del31**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
~~(B) From Early Intake Dam downstream to Lumsden Bridge.~~	~~Last Saturday in April through Nov. 15.~~	~~5 trout~~	**Del31**
	~~Nov. 16 through the Friday preceding the last Saturday in April. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
~~(C) From Lumsden Bridge downstream to Clavey River Falls.~~	~~Last Saturday in Apr. through Nov. 15. Maximum size limit: 12 inches total length Only artificial lures with barbless hooks may be used.~~	~~2 trout~~	**Del31**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	
~~(D) From La Grange Dam downstream to Hickman bridge.~~	~~Jan. 1 through Oct. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(E) From Hickman bridge to the mouth.~~	~~Jan. 1 through Oct. 31. Bait may be used from Jan. 1 through Oct. 31. However, from April 1 through the Friday preceding the fourth Saturday in May, bait may be used only~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery~~	**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	**Menu option**
	~~with single hooks having a gap between 1/2 and 1 inch, or with multiple hooks having a gap between 1/4 and 1/2 inch.~~	~~steelhead** in possession.~~	
(156) Twelvemile Creek (Modoc Co.).	Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures with barbless hooks may be used.	0 trout	**G6**
(157) Twin Lakes (Mammoth, Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(158) Twin Lakes, Upper and Lower (Bridgeport, Mono Co).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
(~~199~~159) Upper Otay Lake (San Diego Co.).	All year. Only artificial lures with barbless hooks may be used.	~~0 for all species~~0 trout	**A6**
(~~199.5~~160) Upper Truckee River and tributaries upstream from confluence with Showers Creek (Alpine and El Dorado ~~Cos.~~cos.).	~~July 1 through Sept. 30. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30. Only artificial lures with barbless hooks may be used.	0 trout	**F6**
(161) Virginia Lakes, Upper and Lower (Mono Co.).	Last Sat.~~urday~~ in Apr.~~il~~ through Nov.~~ember~~ 15.	5 trout	**B1**
~~(200) Usal Creek and tributaries (Mendocino Co.). Also see Section 8.00(b). Usal Creek main stem below the Usal-Shelter Cove Road~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(201) Uvas or Carnadero Creek (Santa Clara Co.) Also see Low-Flow Restrictions, Section 8.00(c)(5).~~			
~~(A) From Highway 152 Bridge to Uvas Dam.~~	~~Closed to all fishing all year~~		**HSS**

Body of Water	*Open Season and Special ~~Regulations~~ Restrictions*	*Daily Bag and Possession Limit*	Menu option
~~(B) From mouth to Highway 152 Bridge.~~	~~Dec. 1 through Mar. 7, but only on Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(202) Van Duzen River (Humboldt Co.). (203.5) Waddell Creek (Santa Cruz Co.) from mouth to Highway 1 bridge. Also see Low-Flow Restrictions, Section 8.00(c)(3).~~	~~See Eel River 7.50(b)(63) and Section 8.00(a). Dec. 1 through Mar. 7, but only Sat., Sun., Wed., legal holidays and opening and closing days. Only barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(204) Walker Creek and tributaries (Marin Co.) Also see Section 8.00(b).~~			
~~(A) Walker Creek main stem below Highway 1.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lures with barbless hooks may be used from the fourth Saturday in May through Oct. 31. Only barbless hooks may be used from Nov. 1 through Mar. 31.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) Walker Creek main stem above Highway 1 and all Walker Creek tributaries.~~	~~Closed to fishing all year.~~	0 trout	**HSS**
(~~204.5~~162) Walker Creek (Mono Co.)~~. from the Lee Vining Conduit to Rush Creek.~~ from the private property line (fence) to the confluence with Rush Creek.	~~Last Saturday in April through Nov. 15. Only artificial lures with barbless hooks may be used.~~All year. Only artificial lures with barbless hooks may be used.		**A6**
(~~205~~163) Walker River, East Fork (Mono ~~County~~Co.) from Bridgeport Dam to Nevada State Line.	Last Sat.~~urday~~ in Apr.~~April~~ through ~~Nov.~~ Nov.~~ember~~ 15. Only artificial lures may be used. Minimum size limit: 18 inches total length. ~~Only artificial lures with barbless hooks may be used.~~ NOTE:	~~1~~2 trout	**B5**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
	BOW AND ARROW FISHING FOR CARP ONLY IS PERMITTED.		
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used. NOTE: BOW AND ARROW FISHING FOR CARP ONLY IS PERMITTED.~~	~~0 trout~~	
~~(205.5) West Walker River (Mono County) from the confluence with the Little Walker River (Hwy. 395 bridge at mile marker 96) downstream (north) to the inlet of Topaz Lake.~~	~~Nov. 16 through the Friday preceding the last Saturday in April. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	**SR**
~~(206) Walnut Creek (Contra Costa Co.) .~~			
~~(A) Upstream of the confluence with Grayson Creek.~~	~~Fourth Saturday in May through Mar. 31. Only artificial lure with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) Downstream of the confluence with Grayson Creek.~~	~~All year.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
(~~206.5~~164) Whiskey Creek (Mono Co.). ~~(A) Whiskey Creek~~ downstream from Crowley Lake Drive (old Highway 395).	~~Last Saturday in April through the Friday preceding Memorial Day and Oct. 1 through Nov. 15. Minimum size limit: 18 inches total length. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through Sep.~~tember~~ 30.	~~2 trout~~5 trout	**F1**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
	~~Saturday preceding Memorial Day through Sept. 30.~~	~~5 trout per day. 10 trout in possession~~	
~~(B) Whiskey Creek upstream from Crowley Lake Drive.~~	~~Last Saturday in April through Nov. 15.~~	~~5 trout per day. 10 trout in possession.~~	**SR**
~~(207) Wildcat Creek and tributaries (Contra Costa Co.)~~	~~Closed all year to fishing~~		**HSS**
~~(208) Willow Creek and tributaries (tributary to Goose Lake, Modoc Co.).~~	~~Saturday preceding Memorial Day through Nov. 15. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	**Del32**
~~(208.5~~165) Wolf Creek and tributaries (tributary to West Walker River) (Mono Co.).	~~August 1 through November 15. Only artificial flies with barbless hooks may be used.~~All year. Only artificial flies with barbless hooks may be used.	0 trout	**A7**
(~~208.6~~166) Wolf Creek Lake (~~tributary to Wolf Creek~~at the headwaters of Wolf Creek, tributary to the West Walker River) (Mono Co.).	Closed to all fishing all year.		**J**
(~~209~~167) Yellow Creek (Plumas Co.) from Big Springs downstream to the marker at the lower end of Humbug Meadow.	~~Last Saturday in Apr. through Nov. 15 Maximum size limit: 10 inches total length. Only artificial lures with barbless hooks may be used.~~ Sat.~~urday~~ preceding Memorial Day through the last day in Feb.~~ruary~~. Only artificial lures with barbless hooks may be used.	~~2 trout~~0 trout	**G6**
(~~210~~168) Yuba River, Middle Fork (Nevada and Sierra ~~Cos.~~cos.) from Jackson Meadows Dam downstream to Milton Lake.	See Milton Lake 7.50(b)~~(120)~~(97).		
(~~211~~169) Yuba River, North Fork (Sierra and Yuba ~~Cos.~~cos.) ~~(A) From~~from the western	~~Last Saturday in Apr. through Nov. 15. Only artificial lures with barbless hooks may be~~	2 trout	**A3**

Body of Water	***Open Season and Special ~~Regulations~~ Restrictions***	***Daily Bag and Possession Limit***	**Menu option**
boundary of Sierra City to the confluence with Ladies Canyon Creek.	~~used~~ All year. Only artificial lures may be used.		
~~(B) From Ladies Canyon Creek downstream to New Bullards Bar Reservoir.~~	~~Last Saturday in Apr. through Nov. 15.~~	~~5 trout~~	**SR**
	~~Nov. 16 through the Friday preceding the last Saturday in Apr. Only artificial lures with barbless hooks may be used.~~	~~0 trout~~	**SR**
~~(212) Yuba River (Yuba and Nevada Cos.) from mouth to Englebright Dam.~~			
~~(A) From mouth to the Highway 20 bridge.~~	~~All year. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**
~~(B) From Highway 20 bridge to Englebright Dam.~~	~~Dec. 1 through Aug. 31. Only artificial lures with barbless hooks may be used.~~	~~2 hatchery trout or hatchery steelhead**. 4 hatchery trout or hatchery steelhead** in possession.~~	**HSS**

~~* Wild Chinook Salmon are those not showing a healed adipose fin clip and not showing a healed left ventral fin clip.~~
~~**Hatchery trout or steelhead in anadromous waters are those showing a healed adipose fin clip (adipose fin is absent). Unless otherwise provided, all other trout and steelhead must be immediately released. Wild trout or steelhead are those not showing a healed adipose fin clip (adipose fin is present).~~

Note: Authority cited: Sections 200, 205, 265, 270, 315, 316.5 and 399, Fish and Game Code. Reference: Sections 200, 205, 265, 270 and 316.5, Fish and Game Code.

Proposed Regulatory Language

Section 8.10, Title 14, CCR, is amended to read:

§ 8.10. Youth Fishing Derby, Susan River (Lassen Co.~~unty~~).
The Susan River, from the second railroad tunnel (the westernmost) on the Biz Johnson Trail downstream to the Riverside Bridge in the City of Susanville, is open to fishing on the Sat.~~urday~~ preceding the ~~last Saturday in April~~ trout season opener on the Sat.~~urday~~ preceding Memorial Day, only to persons under 16 years of age who are registered for the fishing derby sponsored by the Lassen County Sportsmen's Club. See subsection 7.50(b)(149), for fishing regulations for the Susan River.
Note: Authority cited: Sections 200, 202, 205, 215, 220, 240 and 315, Fish and Game Code. Reference: Sections 200, 205, 206 and 215, Fish and Game Code.

STATE OF CALIFORNIA

NATURAL RESOURCES AGENCY

FISH AND GAME COMMISSION

DRAFT NEGATIVE DECLARATION

FOR

PROPOSED SIMPLIFICATION AND AMENDMENTS TO STATEWIDE INLAND SPORT FISHING REGULATIONS TITLE 14, CALIFORNIA CODE OF REGULATIONS

Prepared by:

California Department of Fish and Wildlife
Fisheries Branch

This Report Has Been Prepared Pursuant to the
California Environmental Quality Act of 1970
State of California
Natural Resources Agency
Fish and Game Commission

AUGUST 2020

State Clearinghouse #2020090186

INITIAL STUDY AND NEGATIVE DECLARATION
FOR
PROPOSED SIMPLIFICATION AND AMENDMENTS
TO
STATEWIDE INLAND SPORT FISHING REGULATIONS
TITLE 14, CALIFORNIA CODE OF REGULATIONS

The Project

The California Fish and Game Commission (Commission) proposes to amend sections 3.00, 4.00, 5.00, 5.41, 5.85, 7.00, 7.50, and 8.10 in Title 14, California Code of Regulations (CCR) and add sections 5.84, 5.89, and 7.40 to Title 14, CCR, related to inland sport fishing regulations. The proposed changes aim to simplify and streamline sport fishing regulations for inland trout waters and align the inland trout regulations with the California Department of Fish and Wildlife's (Department) current fisheries management goals and objectives. Inland trout waters include lakes, reservoirs, rivers, streams, creeks, and other water bodies that are fishable under state regulation, and may be regulated by stretch or reach as defined by physical landmarks (e.g., the stretch of Putah Creek downstream of the Highway 113 bridge to Mace Boulevard). The proposed action is taken separately from that to address the complexity of the sport fishing regulations for those inland waters that are utilized by adult fish for migration and spawning after spending the majority of their lives in the ocean (i.e., anadromous waters).

Most of the proposed changes involve re-organizing existing regulatory requirements, and others are restrictions placed on the take of trout, including total or partial closures, reduced bag limits, size limits of various kinds, and limitations on the methods of take. The purpose of the restrictions is to eliminate or reduce the sport fish harvest, to protect populations of threatened trout, or to enhance the trophy element of the catch.

This project will:

- separate regulations for inland trout (i.e., non-anadromous waters) from those for steelhead and salmon (i.e., anadromous waters), a process that facilitates producing separate regulations booklets to help provide clarity to anglers;
- replace the District Regulations (Section 7.00) with statewide regulations separated for trout; and
- standardize and consolidate the Special Fishing Regulations (Section 7.50).

The Findings

In light of the initial study and the whole record before the Commission, there is no substantial evidence that the project may have a significant or potentially significant effect on the environment, and therefore no alternatives or mitigation measures are proposed to avoid or reduce any significant effects on the environment. There is no substantial evidence that the project may have a significant effect on aesthetics, agriculture and forestry resources, air quality, biological resources, cultural resources, energy, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and

planning, mineral resources, noise, population and housing, public services, recreation, transportation, tribal cultural resources, utilities and service systems, or wildfire.

Basis of the Findings

Based on the initial study, there is no substantial evidence that implementing the proposed project may have a significant or potentially significant effect on the environment. Therefore, the Commission is filing this negative declaration pursuant to the California Environmental Quality Act, Public Resources Code Section 21080, subdivision (c).

The proposed initial study and negative declaration consists of:

- Introduction – Project Description and Background Information on the Proposed Amendments to Statewide Inland Sport Fishing Regulations
- Initial Study Environmental Checklist Form
- Explanation of the Response to the Initial Study Environmental Checklist Form
- Attachment A – Initial Statement of Reasons

PROJECT DESCRIPTION AND BACKGROUND INFORMATION FOR PROPOSED AMENDMENTS TO STATEWIDE INLAND SPORT FISHING REGULATIONS TITLE 14, CALIFORNIA CODE OF REGULATIONS

Introduction

Annually, the California Department of Fish and Wildlife (Department) recommends a variety of changes to the inland sport fishing regulations to the California Fish and Game Commission (Commission). The proposed changes are considered and evaluated by the Commission at regularly scheduled meetings, typically held in August, October, and December. The Commission makes the final determination on what changes to the regulations should be adopted at the December meeting.

This year, the Commission received the Department's recommended changes to the inland sport fishing regulations at the Commission's June 24-25, 2020 meeting held via webinar and teleconference and will adopt changes at its October 14-15 meeting in Oakland. The Commission is the lead agency for the purposes of CEQA for this project. Under California Fish and Game Code Section 200, the Commission has the authority to regulate the taking or possession of fish for the purpose of sport fishing.

Project Goals and Objectives

The goal of this project is to amend inland sport fishing regulations in furtherance of the state's policy on conserving, maintaining, and utilizing California's aquatic resources as stated in California Fish and Game Code Section 1700; the section includes three objectives:

1. Maintain sufficient populations of all aquatic species to ensure their continued existence.
2. Maintain sufficient resources to support a reasonable sport use.
3. Manage fisheries using best available science and public input.

Background

In 2013, the Department initiated a comprehensive evaluation of inland sport fishing regulations to address concerns from anglers regarding years of complex regulations. For example, currently there are 212 inland special fishing regulation waters in Section 7.50(b), including 88 different seasons, 13 different size restrictions, 10 different gear restrictions, and 6 different bag and possession limits, for both anadromous and non-anadromous waters. Furthermore, many waters have not been monitored for regulation effectiveness, and changes in hatchery stocking and angling practices warrant an updated evaluation of the sport fishing regulations.

The Department developed a framework to simplify sport fishing regulations guided by five goals or tenets:

1. Maintain or increase angling opportunity;
2. Improve regulatory consistency across similar waters;
3. Align sport fishing regulations with the Department's current fisheries management goals and objectives;

4. Reduce complexity and confusion; and
5. Protect the fishery resources.

After significant review of Special Fishing Regulations in Title 14, subsection 7.50(b), it became apparent much of the complexity and associated public frustration stemmed from the diversity of different regulations established over decades that had limited alignment or consistency. The use of District Fishing Regulations in Title 14, Section 7.00 increases confusion and inconsistency by applying political boundaries in contrast to the watershed approach found within the Special Fishing Regulations. The regulations were also reviewed and updated as necessary to ensure consistency with current management objectives.

Project Location

The sport fishing regulation changes addressed by this environmental document occur throughout the inland waters of California.

Schedule

If adopted by the Commission and approved by the Office of Administrative Law, the proposed regulatory amendments described herein are expected to go into effect March 1, 2021.

Project Description

On June 25, 2020, the Department submitted to the Commission a number of proposed changes to California's inland fisheries sport fishing regulations. Section numbers refer to Title 14, California Code of Regulations (CCR). This project will amend sections 3.00, 4.00, 5.00, 5.41, 5.85, 7.00, 7.50, and 8.10 and add sections 5.84, 5.89, and 7.40.

As part of the effort to update the regulations and reduce complexity, the Department developed a suite of regulations, or "trout menu," comprised of angling seasons, bag and possession limits, size limits, and gear restrictions, to standardize the Special Fishing Regulations in Title 14, subsection 7.50(b) and uncouple the inland trout waters from the District General Regulations in Title 14, subsections 7.00(a)-(g) and from anadromous waters.

Application of the regulation trout menu attempts to standardize the Special Fishing Regulations based on fisheries management goals, which include maximizing fishing opportunity (most liberal) and protecting sensitive fishery populations (most conservative). The process for developing the menu started with identifying the statewide regulations for trout, evaluating the frequency of the most used special regulations, identifying which regulations continue to be biologically and locally relevant, and which are no longer relevant, and then consolidating the relevant regulations into the menu suite of biologically justifiable regulations that most effectively manage California's trout populations.

Trout Menu

The trout menu primarily applies to amended sections 5.85, 7.00 and 7.50, and added Section 7.40. The menu is divided into three categories of a standardized suite of management approaches reflected as regulatory elements for the 200+ inland special fishing waters in California:

- An updated Statewide Regulation;
- Seasons; and
- Bag/ Possession Limits (plus gear restrictions and size limits).

Statewide Regulations

"SL" for Lakes and Reservoirs (proposed in amended subsection 5.85(a)(1)):

Open all year, 5 trout daily bag limit, 10 trout in possession.

"SR" for Rivers and Streams (proposed in amended subsection 5.85(a)(2)):

From the last Saturday in April through November 15, 5 trout daily bag limit, 10 trout in possession; and, from November 16 through the Friday preceding the last Saturday in April, 0 trout bag limit, artificial lures with barbless hooks only and trout must be released unharmed and not removed from the water.

Seasons

Seasons are described and designated by capital letters A-J (under "Menu Option" column shown in Table 1, the amended subsection 7.50(b) table):

A. <u>All year</u> = Most liberal and focused on maximizing angling opportunities.

B. <u>Last Saturday in April through November 15</u> = Spring and summer angling season for both stocked and wild trout. Alignment with traditional trout season and Commission Policy for trout opener. Limited protections for spring and fall spawning trout.

C. <u>November 16 through the Friday preceding the last Saturday in April</u> = For use in conjunction with a spring and summer angling season (**B**) to implement more restrictive bag limits and gear restrictions during spring and fall spawning.

D. <u>Last Saturday in April through July 31</u> = Alignment with a "traditional" trout opener (**A**) to support local communities for seasonal economic and fiscal needs (i.e., spring and summer tourism), and public safety concerns.

E. <u>August 1 through November 15</u> = Summer and fall angling season to allow for limited/selected harvest or closures to protect spawning runs, thermal refuges, or periods of elevated water temperatures.

F. <u>Saturday preceding Memorial Day through September 30</u> = Summer angling season where both spring and fall spawning trout aggregations occur.

G. <u>Saturday preceding Memorial Day through the last day in February</u> = Spring fishing closure to protect spring spawning trout.

H. <u>September 1 through November 30</u> = Fall angling season to either protect fall spawning trout aggregations or allow angling during the fall when summer temperatures make angling impacts more significant.

I. <u>October 1 through the Friday preceding Memorial Day</u> = For use in conjunction with a summer angling season (**F**) to implement more restrictive bag limits and gear restrictions during spring and fall spawning.

J. Closed to fishing all year = Most conservative and used to protect populations that are listed species under the state or federal Endangered Species Act or imperiled populations upon which angling could have a significant negative effect.

Bag and Possession Limits and Gear Restrictions

Bag and possession limits and gear restrictions are described and designated by numbers 1-7 (under "Menu Option" column shown in Table 1, the amended subsection 7.50(b) table):

1. 5 trout, no gear restrictions = (most liberal) Robust, self-sustaining fisheries with low to moderate angling, or stocked fisheries with maximum sustainable harvest.
2. 2 trout per day, 4 trout in possession, no gear restrictions = Limited daily harvest but with additional possession, set for limited effect to hatchery supplemented or productive self-sustaining fisheries to allow some harvest. Moderate concern regarding harvest with minimal threat to total population.
3. 2 trout, artificial lures = Limited daily harvest without additional possession, set for limited effect to less productive self-sustaining fisheries to allow some harvest. Moderate concern regarding harvest with minimal threat to total population.
4. 2 trout with 14" total length minimum, artificial lures = Limited selected harvest with protection for smaller age classes. Allows most individuals to spawn prior to entering the fishery.
5. 2 trout with 18" total length minimum, artificial lures = Limited selected harvest with protection for smaller age classes in high productivity systems that can produce large trout. Allows individuals to spawn prior to trophy sized harvest.
6. 0 trout, artificial lures with barbless hooks = Reduce angling impacts to listed or sensitive populations, mitigate high use areas, seasonally eliminate harvest of spawning fish, or to achieve fast action or trophy fisheries.
7. 0 trout, artificial flies with barbless hooks = (most conservative) Reduce angling impacts to listed or sensitive populations, mitigate high use areas, seasonally eliminate harvest of spawning trout, achieve fast action or trophy fisheries, and/or promote/retain unique angling experiences.

Combined options for season (letter) and bag/possession limit and gear limitation (number) present as a capital letter-number code. For example, "B5" would signify a water with a season from the last Saturday in April through November 15, a bag/possession limit of 2 trout with 18" minimum size, and a gear restriction of artificial lures.

Other Codes

Two other codes in the right-hand column in Table 1, the subsection 7.50(b) table, inform anglers of how that particular water is considered, if it doesn't fall under one of the above codes.

"HSS" Refers to waters moved to the newly added Section 7.40 of Title 14 under the anadromous table for salmon and steelhead, proposed for naming as "Alphabetical List of Hatchery Steelhead and Salmon Waters with Special Fishing Regulations." Those waters with HSS coding are shown as strikeout in Section 7.50 because they are proposed for relocation to Section 7.40.

"Del##" Refers to a special water or regulation that is proposed for removal entirely from the Section 7.50(b) special fishing regulations table, and justification for the removal is outlined by numerical increment under the description for amendment of Section 7.50, with the proposed project and transfer of anadromous waters to a separate Section 7.40.

For those special waters without an assigned management approach from the menu listed in Appendix B, the proposed regulatory text outlining the "Menu Option" in the right-hand column indicates the assigned management approach for each water (assignment to statewide regulations for lakes/reservoirs denoted by "SL", assignment to statewide regulations for rivers and streams denoted by "SR", etc.).

Proposed Regulation Changes

As a result of the streamlining process, the number of:

- special regulation waters is reduced from 212 to 169 (anadromous and non-anadromous)
- special fishing seasons for non-anadromous waters will be reduced from 30 to 10;
- special size limits for non-anadromous waters will be reduced from 8 to 2;
- different gear restrictions for non-anadromous waters will be reduced from 10 to 7;
- different bag/ possession limits for non-anadromous waters will be reduced from 6 to 4; and
- fishing opportunities will be expanded on nearly 50 percent of the existing special regulation waters from a reduced season to year-round.

The proposed regulatory changes fall into two major categories, those that have no effect on fishing restrictions and are primarily administrative in nature, and those that affect restrictions on trout fishing including seasons, bag limits, size limits, and/or gear restrictions.

1. Changes with no effect to fishing restrictions and are for clarity purposes or are primarily administrative in nature. These changes include:

    a. *Section 5.00 Black Bass*

        - <u>Subsections (b)(2) for waters in Inyo County, and (b)(5) and (b)(16) for waters in Mono County.</u> The Department is amending subsections (b)(2) and (b)(5) for waters in Inyo County to include reference to Inyo County streams and rivers in the Special Fishing Regulations in subsection 7.50(b). Subsection (b)(2) and (b)(5) amendments also clarify the closure to black bass fishing from November 16 to the Friday preceding the last Saturday in April to ensure anglers understand the open season is late April through November 15. Subsection (b)(16) similarly includes reference to Mono County streams and rivers in the Special Fishing Regulations in subsection 7.50(b), while correcting a reference for Fish Slough to the boundaries from Owens Valley Native Fishes Sanctuaries to the BLM Spring.
        - <u>Subsection 5.00(b).</u> The resulting proposed list of special black bass waters is re-numbered by paragraph for clarity and consistency.

- Subsections (b)(15) and (b)(22). Two changes of non-regulatory effect include removal of (b)(15) El Capitan Reservoir, and (b)(22) Perris Lake as listed in the table, due to existing redundancy with the statewide standard because the season (all year), size (12-inch minimum), and bag limit already matches that of the statewide standard.
- The special closure language for (b)(14), Eastman Lake is being removed. This language was removed from the sport fishing regulations in 2017.
- Subsection (a) title, General Statewide Restrictions, is changed to read General Statewide Regulations to be more accurate and consistent with other statewide regulations sections in Title 14.
- Subsection (a)(1) is being amended to specify that the Black Bass 12-inch minimum size limit is to be measured in total length. This requirement is already specified in subsection 5.00(b). It is being added to Section 5.00(a)(1) to provide additional clarity.

b. *Section 5.41. Landlocked Salmon*

- Subsection (e). This subsection is amended so that the same exceptions formerly referenced in subsection 7.50(b) are specifically listed within this subsection with a daily bag limit of ten salmon, and possession limit of twenty.

c. *Section 5.85 Trout*

- Subsection (b). This subsection describes those exceptions to the statewide regulations, and refers readers to Section 7.50, Alphabetical List of Waters with Special Fishing Regulations for individual trout waters with special regulations that would not fall under the statewide regulation. Subsection (b) further clarifies that brook trout bag and possession limits may be in addition to the trout bag and possession limits.

d. *Section 7.00. District General Regulations*

- Subsections (a)(1) and (b)(3). These subsections will be deleted. Waters under the North Coast District and Sierra District subsections are currently open to fishing all year, with a 5-trout daily bag limit, a 10-fish possession limit, no size limit, and no gear restriction. For simplification purposes, regulations for these waters will move/revert to subsection 5.85(a)(1), the new Statewide Regulation for lakes and reservoirs. In effect, there will be no substantive change to the existing regulations for these waters.
- Subsection (b)(8), delete this subsection: This language is no longer needed under Section 7.00(b) as all Mono County waters under the District General Regulations will be subject to the two new Statewide Regulations for trout (i.e., Section 5.85(a) or Section 5.85(b)), or to Section 7.50(b), Special Fishing Regulations. This language does not need to move to Section 5.85 or Section 7.50 as waters under the new Statewide Regulations will be open to fishing year-round and similar language already exists under subsection 7.50(a)(3) of the Special Fishing Regulations.

- Subsection (b)(2), amend this subsection: Anadromous waters under this subsection for Tehama and Shasta counties are currently open to fishing from the last Saturday in April through November 15, with a 2-trout or steelhead daily bag and possession limit, and artificial lures with barbless hooks restriction. This subsection is amended for section and paragraph numbers, and to clarify the artificial lures possess hooks that are barbless.
- Edits for clarity and consistency: These edits include re-numbering of paragraphs within District Regulations in subsections 7.00(b) through (g), adjusted capitalization of certain words throughout Section 7.00, and specification of the referenced Section number to clarify interpretation from the previous 7.50 to the newly added 7.40 section.

e. *Section 8.10, Youth Fishing Derby, Susan River (Lassen County)*

- The Youth Fishing Derby on the Susan River is held every year one week before the trout season opener, which currently is the Saturday preceding the last Saturday in April. The Department is proposing to move the season opener from the last Saturday in April to the Saturday preceding Memorial Day. The Department will continue to hold the derby on the Saturday before the season opener and, therefore, it is necessary to change the youth fishing derby date from the Saturday preceding the last Saturday in April to the Saturday preceding the trout season opener in May. Added language refers to subsection 7.50(b)(149) for regulations on the Susan River.

f. *Add Section 5.89. Salmon*

- This Section will be added only to refer readers to the appropriate regulatory sections for salmon and steelhead, which are not the focus of this current rulemaking, but may be for a subsequent one (i.e., Phase II).

g. *Add Section 7.40. Alphabetical List of Hatchery Trout, Hatchery Steelhead, and Salmon Waters with Special Fishing Regulations*

- For simplification purposes, the Department is proposing to separate the trout special fishing regulation waters (inland waters) from the salmon and steelhead special fishing regulation waters (anadromous waters). The special fishing regulations for trout will remain in Section 7.50. This requires a new regulatory section be created for the hatchery trout, hatchery steelhead and salmon special fishing regulation waters (abbreviated “HSS” per the coding outlined in the trout menu). The proposed new section is Section 7.40, Alphabetical List of Hatchery Trout, Hatchery Steelhead, and Salmon Waters with Special Fishing Regulations. The existing language in subsections 7.50(a)(1)-(6) will be included in the new Section 7.40, but references to trout will be replaced with salmon and steelhead. All the special waters indicated by the coding “HSS” in the subsection 7.50(b) table are moved into the new 7.40 table, and aside from this move, are not proposed to be altered as part of this rulemaking. Approximately 185 individual waters, or reaches of waters, are proposed to be moved from subsection 7.50(b) to the new 7.40 table.

h. *Amend Section 3.00. Fishing Hours*

- The reference in subsection (a)(1)(B) Heenan Lake, (Alpine Co.) is changed to subsection 7.50(b)(56) because of renumbering in the section.

i. *Amend Section 4.00. Bait - General*

- The reference in subsection (d) Hat Creek is changed to subsection 7.50(b)(55) because of renumbering in the section.

2. Changes with effects to restrictions on trout fishing including seasons, bag limits, size limits, and/or gear restrictions are in Sections 5.00, 5.84, 5.85, 7.00, and 7.50, and are discussed individually in this document. There is no substantial evidence that any of the proposed changes will result in a significant effect on the environment. Specific changes to the regulations under the Project are attached to this Negative Declaration as Attachment A.

a. Section 5.00. Black Bass

- <u>Subsections (b)(3) Lassen County; (b)(4) Modoc County; (b)(7) Shasta County; (b)(9) Big Lake (Shasta County); (b)(13) Diamond Valley Lake; (b)(25) Silverwood Lake; (b)(26) Skinner Lake; and (b)(28) Trinity Lake.</u> These waters will be removed from the bass special regulations and will revert to the statewide standard under subsection 5.00(a) of open to fishing all year, with a 12-inch minimum size limit, and a 5-fish daily bag limit. As a result, the current “no size limit” restriction on lakes and reservoirs in Lassen, Modoc, and Shasta counties and the 15-inch minimum size limit restriction on Diamond Valley, Silverwood, and Skinner lakes will revert to the standard 12-inch minimum size limit. The 2-fish bag limit on Silverwood, Skinner, and Trinity lakes will revert to the standard 5-fish bag limit.
- Subsection (b)(29) Trout Lake. Amend the existing bass fishing season on Trout Lake to align with the proposed new trout fishing season under the Statewide Regulation “SL” as listed in subsection 7.50(b)(195.5) for Trout Lake. Under existing regulations, the fishing season for trout and bass is limited to Wednesdays and weekends from the last Saturday in April through September 30. This season was in place to restrict fishing in the Shasta Valley Wildlife Area during the waterfowl hunting season. Considering that management has shifted from focusing on trophy bass to general fishing opportunity, and because of other changes in waterfowl management through the Department’s Lands Division, there is no longer a biological reason for restricting the fishing season on this lake,. The Department no longer manages Trout Lake as a trophy bass fishery and instead the lake is opened to general fishing opportunity, thus the current 22-inch minimum size limit and 1-fish bag limit is no longer necessary. Therefore, the Department is proposing to remove Trout Lake from the Special Black Bass fishing regulations. The Department’s Lands division manages access to Trout Lake, including via a Lands Pass or other requirement pursuant to regulations for Wildlife Areas. This change will align the fishing seasons for bass and trout on the lake and, thus, eliminate potential law enforcement issues. With the removal of Trout

Lake from 5.00(b), the regulation for bass fishing on that lake will revert to the statewide standard under subsection 5.00(a) of open to fishing all year, with a 12-inch minimum size limit, and a 5-fish daily bag limit.

b. Section 5.84. Brook Trout.

- Currently under the North Coast and Sierra District General Regulations (subsections 7.00(a)(5) and (b)(9)) up to 10 Brook Trout less than 8 inches and 10 inches, respectively, may be harvested per day, in addition to the daily bag and possession limits for trout. This regulation will be removed from Section 7.00 under the current proposal to uncouple the trout regulations from the District General Regulations. In its place, the Department is proposing a new Statewide Regulation for Brook Trout in Section 5.84 which will allow the harvest of up to 10 Brook Trout less than 10 inches per day in all inland trout waters, year-round. Because of the remoteness of these fisheries and for simplification purposes, the Department is proposing to expand the Brook Trout bonus bag and possession limit to inland trout waters statewide. Exceptions to this Brook Trout bonus bag limit include all waters listed in Section 7.50, Trout Waters with Special Fishing Regulations, and Red Lake in Alpine County, which is managed as a trophy Brook Trout fishery.

c. Section 5.85. Trout.

- <u>Subsection (a)(1).</u> This subsection is being added to Section 5.85 to provide a new statewide regulation for slow-moving waters, or inland lakes, reservoirs, and ponds, as described in the trout menu and noted by the coding “SL.” Under the new Statewide Regulation, these waters will be open to fishing all year, with a 5-trout daily bag limit, and 10-trout possession limit.
- <u>Subsection (a)(2).</u> This subsection is being added to Section 5.85 to provide a new statewide regulation for fast-moving waters, or streams, rivers, creeks, and canals, as described in the trout menu and noted by the coding “SR.” Under the new Statewide Regulation, these waters will be open to fishing from the last Saturday in April through November 15, with a 5-trout daily bag limit, and a 10-trout possession limit; and, from November 16 through the Friday preceding the last Saturday in April, with a 0-trout bag limit, and artificial lures with barbless hooks only gear restriction.

d. Section 7.00. District General Regulations

To address anglers’ concerns regarding the complexity of the 7.00 District General Regulations, the Department is proposing to uncouple the state’s inland trout waters from the District General Regulations. Most regulations for trout waters currently under the District General Regulations will be moved to either the new subsection 5.85(a)(1), Statewide Regulation for lakes and reservoirs, or to subsection 5.85 (a)(2), Statewide Regulation for rivers, streams, creeks, and canals. Some individual trout waters will require special restrictions and reduced

bag limits and, therefore, these regulations will be moved to Section 7.50, Special Fishing Regulations. The amendments will result in little or no substantive change to the regulations for most waters currently under the District General Regulations. Clarifications are made to the opening paragraph prior to subsection 7.00(a) to ensure clarity that hatchery trout and hatchery steelhead are covered under Section 7.00.

The Department proposes to remove or amend 18 subsections:

i. Subsections (a)(4), (b)(4), and (b)(7). These subsections will be deleted. Waters under the North Coast District and Sierra District subsections are currently open to fishing from the last Saturday in April through November 15, with a 5-trout daily bag limit, a 10-trout possession limit, and no gear restriction. For simplification purposes, regulations for these waters will move/revert to subsection 5.85(a)(2), the new Statewide Regulation for rivers and streams, which will extend the fishing season on these waters to year-round with catch and release fishing allowed from November 16 through the Friday preceding the last Saturday in April.

ii. Subsection (g)(1). This subsection will be deleted. Waters under this subsection are currently open to fishing year-round, with a 10-trout daily bag and possession limit, and no gear restriction. For simplification purposes, regulations for these waters will move/revert to subsection 5.85(a)(2), Statewide Regulation for rivers and streams. This will reduce the daily bag limit from 10 trout to 5 trout from the last Saturday in April through November 15 and allow catch and release fishing only from November 16 through the Friday preceding the last Saturday in April.

iii. Subsections (a)(5) and (b)(9). These subsections will be deleted. The current bonus bag limit for Brook Trout under the North Coast and Sierra District General Regulations will move/revert to a new Section 5.84, Statewide Regulation for Brook Trout. The new Statewide Regulation for Brook Trout will apply to all inland trout waters not listed under the Special Fishing Regulations, except for Red Lake in Alpine County which is managed for trophy-sized trout by stocking effort.

iv. Subsection (b)(5). This subsection will be deleted. Waters under this subsection in Shasta County are currently open to fishing from the last Saturday in April through November 15, with a 2-trout daily bag and possession limit, and no gear restriction. For simplification purposes, regulations for these waters will move/revert to subsection 5.85(a)(2), the new Statewide Regulation for rivers and streams. This proposed change will increase the current daily bag limit to 5 trout and add a 10 - rout possession limit. In addition, the fishing season will be extended to year-round, with catch and release fishing allowed from November 16 through the Friday preceding the last Saturday in April.

v. Subsection (b)(6). This subsection will be deleted. Waters under this subsection in Lassen and Modoc counties are currently open to fishing from the Saturday preceding Memorial Day through November 15, with

a 5-trout daily bag limit, a 10-trout possession limit, and no gear restriction. For simplification purposes, regulations for these waters will move/revert to subsection 5.85(a)(2), the new Statewide Regulation for rivers and streams. This will extend the fishing season to year-round, with catch and release fishing allowed from November 16 through the Friday preceding the last Saturday in April.

vi. Subsections (c)(1), (d)(1), (e)(1), (f)(1), and (g)(2). These subsections will be deleted. Waters under these subsections in the North Central District, Valley District, South Central District, Southern District, and Colorado River District are currently open to fishing all year, with a 5-trout daily bag and possession limit, and no gear restriction. For simplification purposes, regulations for these waters will move/revert to subsection 5.85(a)(1), Statewide Regulation for lakes and reservoirs. As a result, the possession limit on these waters will increase from 5 trout to 10 trout.

vii. Subsections (d)(3), (f)(3), (f)(5), and (g)(2). Delete these subsections; waters under these subsections in the Valley District, Southern District, and Colorado River District are currently open to fishing all year, with a 5-trout daily bag and possession limit, and no gear restriction. For simplification purposes, regulations for these waters will move/revert to subsection 5.85(a)(2), Statewide Regulation for rivers and streams. As a result, the possession limit will increase from 5 trout to 10 trout from the last Saturday in April through November 15. Catch and release fishing only will be allowed from November 16 through the Friday preceding the last Saturday in April.

viii. Subsection (e)(3). Amend this subsection; waters under this subsection for Alameda, Contra Costa, and Santa Clara counties are currently open to fishing from the last Saturday in April through November 15, with a 5-trout daily bag and possession limit, and no gear restriction. For simplification purposes, regulations for these waters will move/revert to subsection 5.85(a)(2), the new Statewide Regulation for rivers and streams. This will increase the possession limit to 10 trout and extend the fishing season to year-round, with catch and release fishing allowed from November 16 through the Friday preceding the last Saturday in April.

a. Section 7.50. Alphabetical List of Trout Waters with Special Fishing Regulations

It is necessary to streamline the Special Regulations for trout waters by utilizing the trout menu to align the regulations with the Department's current fisheries management goals and objectives. The regulations proposed herein were tailored to each individual water, and include a variety of combinations of regulation elements, such as bag limits, gear restrictions, season restrictions, and size limits. Upon review of the extensive public input received during pre-notice outreach efforts, Department fisheries biologists and managers, often in consultation with fishing groups or individuals, assigned waters to the trout menu based on their expertise and knowledge of specific waters in their management area.

As noted in the attached initial statement of reasons (ISOR), proposed amendments and additional comments and considerations are summarized for Section 7.50(b), Alphabetical List of Waters with Special Fishing Regulations. The ISOR includes the biological and management rationale for proposed changes to each special water, as well as other considerations such as public input, socio-economic considerations, traditional values, access, public safety, etc.

Statewide Analysis

Because this is a statewide regulation change affecting inland sportfishing, changes to special waters for the 7.50 table was analyzed. Five regulatory elements were examined to assess the change in environmental baseline by county. Table 1 shows increases or decreases in the number of special waters with regard to:

1. Season increasing in duration, including those going year round;
2. where catch and release opportunity will be expanded (i.e., increased possession limits);
3. where bag limits will be increased;
4. where gear restrictions will be reduced or eliminated; and
5. where minimum size limits will be decreased.

In many cases, the regulatory proposal to balance angler opportunity with natural resources management was balanced. For instance, if a season were lengthened, frequently this would be paired with a decrease in bag limit. Many changes from a restricted season to year-round were paired with a 0-trout bag limit. Many waters were moved, with no substantive change, to Section 7.40, Alphabetical List of Hatchery Trout, Hatchery Steelhead, and Salmon Waters with Special Fishing Regulations. Others were removed from Section 7.50 because they would be covered under the proposed Statewide Regulation for lakes and reservoirs (SL), or rivers and streams (SR). Changes to the individual streams, rivers, creeks, or waterbodies outlined in the proposed revisions to Section 7.50 are summarized by county in Table 1.

Several waters were moved from the previous District regulations (Section 7.00) to having a specific season, bag or possession limit, or gear restriction for the special waters listed in Section 7.50 because they would not otherwise fit into the new statewide regulation for lakes and reservoirs, and streams and rivers under amended Section 5.85. To preserve the same season, bag/possession limit, and/or gear restriction listed in Section 7.00, those waters had to be moved to the Special Waters Section 7.50 table. Those waters identified as “new” in Table 1 are further detailed in Table 2 with respect to specific changes in moving from the District regulations to the Special Regulations in Section 7.50.

Table 1. Summary of Changes by County for Special Waters (Section 7.50 table) With Proposed Sportfish Simplification*

County	# of Waters[1] Changing/ Total (+ New)	Notes on New	Increase in Season	Net Change in Angler Day Opportunity (New-Old)*	Increased Possession Limit	Increased Bag Limit	Gear Restrictions Decrease	Minimum Size Decrease	HSS	SL//SR	Del
Alameda	3/ 5 (+1)	A6		-74					1		
Alpine	6 /12 (+1)	A6	5	165		1	3				
Amador	2/ 2		1	0					1	1//	
Butte	12 /12		1	77					12		
Calaveras	3 /4			0					3		
Colusa	5 /5		1	159					3		
Contra Costa	7 /7			0					7		
Del Norte	5 /6			0					5		
El Dorado	5/ 5		3	40			1			1//	
Fresno	8 /14 (+2)	A1	4	469	2	2			2	//1	
Glenn	5/ 5		1	0					4		1
Humboldt	22 /23		1	77					17	1//1	
Inyo	14 /14 (+1)	B1	7	272		3	3			2//2	3
Kern	3 /3 (+2)	A1	2	159	2	1	2				
Lake	6/ 6		1	88					1		1
Lassen	7/ 11		4	575	1	3	3				2

County	# of Waters[1] Changing/ Total (+ New)	Notes on New	Increase in Season	Net Change in Angler Day Opportunity (New-Old)*	Increased Possession Limit	Increased Bag Limit	Gear Restrictions Decrease	Minimum Size Decrease	HSS	SL//SR	Del
Los Angeles	2/ 7			0					2		
Madera	5/ 5		2	45	1				2	//1	
Marin	8/ 8			-148			1	1	4		
Mariposa	3 /3			0					0	//3	
Mendocino	20 /20		1	77				1	18	1//	
Merced	7 /7			0					4	//3	1
Modoc	14 /14 (+4)	G6	10	501	3	4	2		0	//1	4
Mono	55 / 66 (+17)	B1, F1	39	3448	19	26	25	3	0	1//5	5
Monterey	19 / 20		1	-175					14	1//1	
Napa	4 /4			0					2		
Nevada	15 /18		6	721			1	4	4	1//	2
Orange	4 /4										
Placer			1								
Plumas	9/ 12		3	137	1			1		1//1	
Riverside	2 /2			0							
Sacramento	7 /7		2	0	1	1	1				
San Benito	2 /2			0							

County	# of Waters[1] Changing/ Total (+ New)	Notes on New	Increase in Season	Net Change in Angler Day Opportunity (New-Old)*	Increased Possession Limit	Increased Bag Limit	Gear Restrictions Decrease	Minimum Size Decrease	HSS	SL//SR	Del
San Bernardino	3 /3 (+3)	A1	3	0	3	3	4			//1	
San Diego	3 /4 (+4)	A3	5	365	5	5	5		3		
San Joaquin	8 /8			0							
San Luis Obispo	14 /14			0					11	1//1	1
San Mateo	12/ 12			-296					8	//1	
Santa Barbara	3 /3			0	1				2		
Santa Clara	14 /14 (+2)	A6	3	0	3	3	3		12		
Santa Cruz	6 /6			0					6		
Shasta	28 /32		9	752	1	1	4		3	1//2	6
Sierra	5 /6		2	636			1	1			
Siskiyou	16/ 19		1	399	3	1	1		3	2//1	8
Solano	1/ 3			0					1		
Sonoma	12/ 13			-148	2				10		
Stanislaus	4/ 5			0					4		
Sutter	12/ 12			0					12		
Tehama	13/ 13			0					13		

County	# of Waters[1] Changing/ Total (+ New)	Notes on New	Increase in Season	Net Change in Angler Day Opportunity (New-Old)*	Increased Possession Limit	Increased Bag Limit	Gear Restrictions Decrease	Minimum Size Decrease	HSS	SL//SR	Del
Trinity	19/ 19		6	239			3	3	8	1//2	1
Tulare	6/ 7	1	1	318	2	1	3	1		//2	1
Tuolumne	6/ 7		4	153	2	1	2		2		
Ventura	2/ 6			0						//2	
Yolo	1/ 1			0					1		
Yuba	12/ 13		1	318			1		9		

Caveats:

[1]This table includes waters, or reaches of waters (denoted by subsection 7.50(b)(91)(A), (B), (C) (D), etc.) Kings, Imperial Counties have no special waters.

Increase in Season: Increase in season ONLY considered if there is an increase in angler days, and not going from a full-year split season.

> *Net changes in days available for angling is based on the net change in days per county from changes in proposed regs. If a water or two different segments of a water show the same change in season (e.g., B1 to F1), this change is Last Saturday in April through November 15 (206 days) - Saturday preceding Memorial Day through September 30 (~132 days) = Net of -74 days. Net changes do not include new angler days available with new waters or segments of waters moving from District Regulations (7.00) to the Special Regulations (7.50) (See Table 2 for examination of new waters).*

"HSS" Refers to waters moved to the newly added Section 7.40 of Title 14 under the anadromous table for salmon and steelhead, proposed for naming as "Alphabetical List of Hatchery Steelhead and Salmon Waters with Special Fishing Regulations."

"Del##" Refers to a special water or regulation that is proposed for removal entirely from the Section 7.50(b) special regulations table, and justification for the removal is outlined by numerical increment below under the description for amendment of Section 7.50.

"SL" for Lakes and Reservoirs (proposed in amended subsection 5.85(a)(1))

"SR" for Rivers and Streams (proposed in amended subsection 5.85(a)(2))

Table 2. Summary of Changes for New Waters by County.

County	7.50(b) subsection Water(s)	District (7.00)	7.00 District Season, Bag/ Possession	7.50 New Reg Season, Bag/ Possession
Alameda	7.50(b)(2)(C) San Antonio, Calaveras Reservoirs	South Central	Last Sat. Apr.-Nov. 15; 5 trout	All Year, 0 trout, ALBH
Alpine/ El Dorado	7.50(b)(24) Caples Creek	Sierra	Last Sat. Apr.-Nov. 15; 5/ 10 trout	All Year, 0 trout, AFBH
Fresno	7.50(b)(70)(E)1., (70)(G) Kings River	Valley	All Year, 5 trout	same
Inyo	7.50(b)(124) Sabrina Lake	Sierra	Last Sat. Apr.-Nov. 15; 5/ 10 trout	last Sat. Apr.-Nov. 15; 5 trout
Kern	7.50(b)(65) Isabella Lake; 7.50(b)(69)(C) Kern River	Valley	All Year, 5 trout	same
Modoc	7.50(b)(43) Dismal Creek; (52) Goose Lake & tribs; (109) Pit River; (156) Twelvemile Creek	Sierra	Sat. before Memorial Day - Nov. 15; 5/ 10 trout	last day Feb., 0 trout, ALBH; 2 or 5 trout
Mono	7.50(b)(16) Bridgeport Reservoir & tribs; (30) Convict Lake; (50) George Lake; (53) Grant Lake; (54) Gull Lake; (60) Horseshoe; (67) June Lake; (82) Lundy Lake; (85) Mamie Lake, (89) Mary Lake; (121) Rock Creek; (123)(B) Rush Creek*, (137) Silver Lake; (144) South Lake; (157) Twin Lakes Mammoth; (158) Twin Lakes Bridgeport (161) Virginia Lakes.	Sierra	Last Sat. Apr.-Nov. 15; 5/ 10 trout	last Sat. Apr.-Nov. 15; 5 trout *Sat. before Memorial Day – Sept. 30; 5 trout (1)
San Bernardino	7.50(b)(83) Lytle Creek; (96) Miller Canyon; (130) Santa Ana	Southern	All Year, 5 trout	same
San Diego	7.50(b)(15) Boulder Creek; (72) Kitchen Creek; (107) Pine Valley Creek; (129) San Luis Rey River	Southern	All Year, 5 trout	All year, AL, 2 trout
Santa Clara	7.50(b)(81) Los Gatos Creek; (147) Stevens Creek	South Central	Last Sat. Apr.-Nov. 15; 5 trout	All year, ALBH, 0 trout

AL= artificial lures; ALBH = artificial lures w/ barbless hooks; AFBH = artificial flies w/ barbless hooks

INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

1. Project Title:
   Proposed Simplification and Amendments to Statewide Inland Sport Fishing Regulations, Title 14, California Code of Regulations

2. Lead Agency Name and Address:
   California Fish and Game Commission
   P.O. Box 944209
   Sacramento, CA 94244-2090

3. Contact Person and Phone Number:
   Melissa Miller-Henson, (916) 653-4899

4. Project Location:
   Inland trout and bass waters of California.

5. Project Sponsor's Name and Address:
   California Department of Fish and Wildlife
   Fisheries Branch
   P.O. Box 944209
   Sacramento, CA 94244-2090

6. General Plan designation:
   N/A (statewide)

7. Zoning:
   N/A (statewide)

8. Description of Project:
   The California Fish and Game Commission proposes to amend sport fishing regulations for inland trout and bass waters including seasons, daily bag and possession limits, size limits, gear restrictions, and water area boundaries, to maintain consistency with the mission of managing California's diverse fisheries resources for their ecological value and their use and enjoyment by the public.

9. Surrounding land uses and setting:
   N/A

10. Other Public Agencies Whose Approval Is Required:
    None.

11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.31?
    The Department and Commission, consistent with the Department's Tribal Communication and Consultation Policy and the Commission's Tribal Consultation Policy, sent a letter inviting the tribes listed with the Native American Heritage Commission to consult or provide comments concerning the project. No reply was received.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forestry	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology/Soils	☐ Greenhouse Gas Emissions	☐ Hazards and Hazardous Materials
☐ Hydrology/Water Quality	☐Land Use/Planning	☐Mineral Resources
☐ Noise	☐ Population/Housing	☐ Public Services
☐ Recreation	☐ Transportation	☐ Tribal Cultural Resources
☐ Utilities/Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

This project will not have a “Potentially Significant Impact” on any of the environmental factors listed above.

DETERMINATION

On the basis of this initial evaluation:

☒ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Original signed document on file with the Commission

Melissa Miller-Henson, Executive Director **Date** Sep. 9, 2020

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND EXPLANATION OF RESPONSES TO INITIAL STUDY ENVIRONMENTAL CHECKLIST

I. AESTHETICS.

Except as provided in Public Resources Code Section 21099, would the project:

	I.	II.	III.	IV.
a) Have a substantial adverse effect on a scenic vista	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality.	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

AESTHETICS – Explanation for Significance

a) The project will not have an adverse effect on a scenic vista. Such an impact will not occur because the project will not involve any construction, land alteration, or modification of any buildings or structures.

b) The project will not damage scenic resources such as trees, rock outcroppings, and historic buildings. Such an impact will not occur because the project will not involve any construction, land alteration, or modification of any buildings or structures.

c) The project will not substantially degrade the existing visual character or quality of public views of the site and its surroundings. Such an impact will not occur because the project will not involve any construction, land alteration, or modification of any buildings or structures.

d) The project will not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

II. AGRICULTURE AND FORESTRY RESOURCES.

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

	I.	II.	III.	IV.
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Significance Codes:

I. Potentially Significant Impact

II. Less than Significant Impact with Mitigation Incorporated

III. Less than Significant Impact

IV. No Impact

AGRICULTURE AND FORESTRY RESOURCES – Explanation for Significance

a) The project will not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to non-agricultural use. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.

b) The project will not conflict with existing zoning for agricultural use or a Williamson Act contract. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.

c) The project will not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timber zoned Timberland Production. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.

d) There will be no loss of forest land and the project will not result in the conversion of forest land to non-forest use. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.

e) The project will not involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland to non-agricultural use. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.

III. AIR QUALITY.

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:

	I.	II.	III.	IV.
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in any other emissions such as those leading to odors affecting a substantial number of people?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

AIR QUALITY – Explanation for Significance

a) The project will not conflict with or obstruct implementation of the applicable air quality plan. Such an impact will not occur because the project will not create any features that would be a source of air pollution.

b) The project will not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard. Such an impact will not occur because the project involves no ongoing sources of air pollution.

c) The project will not expose sensitive receptors to substantial pollutant concentrations. There may be a small increase in air pollutant emissions due to a small increase in angler trips, but the impacts on air quality will be less than significant because the number of angler trips is expected to be much lower in the winter months due to inclement weather and less trout activity during this time.

d) The project will not create objectionable odors affecting a substantial number of people.

IV. BIOLOGICAL RESOURCES.

Would the project:

	I.	II.	III.	IV.
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

BIOLOGICAL RESOURCES – Explanation for Significance

a) The project will not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (Department), National Marine Fisheries Service (NMFS) or U.S. Fish and Wildlife Service (USFWS).

This project will amend sport fishing regulations for trout in inland waters of California to simplify and streamline the inland trout regulations and align the regulations with the Department's current fisheries management goals and objectives. The project includes changes to trout fishing seasons, bag and possession limits, gear restrictions, and size limits. Species of trout subject to sport fishing regulations in California include California Golden Trout, Rainbow Trout, Brown Trout, Brook Trout, Lahontan Cutthroat Trout, Eagle Lake Rainbow Trout, Kern River Rainbow Trout, Goose Lake Redband Trout, McCloud River Redband Trout, Paiute Cutthroat Trout, Little Kern Golden Trout, and Warner Lakes Redband Trout.

Three of these species of trout are classified as threatened or endangered by the federal or state government. These include the Little Kern Golden Trout of the Little Kern River drainage (Tulare County); Lahontan Cutthroat Trout which inhabit several lakes and streams in the central Sierra Nevada; and the Paiute Cutthroat Trout which occupy the Silver King Creek drainage (Alpine County), North Fork of Cottonwood Creek (Mono County), Sharktooth Creek (Fresno County), and Stairway Creek (Madera County). All three of these species are listed as threatened under the federal Endangered Species Act. Below is a description of the potential effects of the project on these species.

<u>Little Kern Golden Trout</u>

The Little Kern Golden Trout has regulatory protection which currently consists of a reduced fishing season, five-trout daily bag and possession limit, and gear restricted to artificial lures with barbless hooks. The project proposes to amend the fishing regulations in the Golden Trout Wilderness Area to allow fishing all year and reduce the daily bag limit to two trout. In addition, because take is allowed, the requirement for barbless hooks will be removed. While this proposed regulation change will increase fishing opportunity on Little Kern Golden Trout, the reduced daily bag limit will protect small and vulnerable populations of native Golden Trout and keep populations at self-sustaining levels. In addition, the Little Kern Golden Trout is located in the Golden Trout Wilderness Area, where angling pressure is light. As a result, the proposed regulation changes will have a less than significant effect on this species.

Paiute Cutthroat Trout

The Paiute Cutthroat Trout is protected by closures of the following waters: North Fork Cottonwood Creek and tributaries (Mono County), Coyote Valley Creek and tributaries (Alpine County), Corral Valley Creek and tributaries (Alpine County), and Silver King Creek and tributaries (Alpine County). The project is not proposing to change the current fishing regulations for these waters. Therefore, the project will have no effect on Paiute Cutthroat Trout.

Lahontan Cutthroat Trout

A broodstock of Lahontan Cutthroat Trout (LCT) is maintained in Heenan Lake (Alpine County) that provides fish for planting in California waters. Progeny from this broodstock are stocked in several Lahontan drainage lakes and streams. Several waters are currently closed to fishing to protect LCT. These include By-Day Creek and tributaries (Mono County), Macklin Creek (Nevada County), Martis Lake tributaries (Nevada and Placer counties), East Fork Carson River above Carson Falls and tributaries (Alpine County), Murray Canyon Creek (Alpine County), Pole Creek and tributaries (Placer County), Meiss Lake (Alpine County), and Mill Creek and tributaries (Mono County). In addition to these closures, LCT has regulatory protection on Heenan Lake (its tributary is closed to fishing), Independence Lake (its tributaries are closed to fishing), West Fork of Portuguese Creek, Slinkard Creek, Upper Truckee River, Convict Creek, Hilton Creek, McGee Creek, Kirman Lake, Owens River, Robinson Creek, Rush Creek, Wolf Creek, and Whiskey Creek. This project proposes to amend the fishing regulations for several of the waters listed above. Below is a discussion of the potential effects to LCT.

1) Upper Truckee River. The project proposes to amend the regulations on the Upper Truckee River in Alpine County. For simplification purposes, the project proposes to change the fishing season on the upper Truckee River from July 1 through September 30 to the Saturday preceding Memorial Day through September 30. The current zero trout bag limit and artificial lures with barbless hooks gear restriction will remain in place. This proposed regulation change will provide one additional month of angling opportunity and will have no significant effect on LCT.

2) Meiss Lake. Meiss Lake is currently closed to fishing. Meiss Lake is on a tributary to the Upper Truckee River that allows catch and release fishing. The project proposes to open the lake to catch and release fishing to conform with the current regulations on the Upper Truckee River and its tributaries. Meiss Lake is shallow with subsurface vegetation, creating a difficult fishery. In addition, the Department's data show there are very few, if any, LCT in Meiss Lake. The proposed regulation change will have a less than significant effect on LCT.

3) Slinkard Ceek. Slinkard Creek is currently open to fishing from August 1 through November 15, with a zero trout bag limit, and gear restricted to artificial flies with barbless hooks. The project proposes to open Slinkard Creek to fishing all year with no change to the bag limit or gear restriction. This regulation change will provide anglers additional opportunity for LCT catch and release fishing. The current restrictions on harvest and gear provide protection for LCT. Slinkard Creek has a robust population of LCT and can sustain catch and release fishing year-round. In addition, Slinkard Creek is

hard to access for some anglers, so fishing pressure on this water is light. The proposed regulation change will have a less than significant effect on LCT.

4) Martis Lake tributaries. Martis Lake tributaries are currently closed to fishing. The project proposes to open these tributaries to fishing all year, with a zero trout bag limit, and gear restricted to artificial lures with barbless hooks. This will provide opportunity for catch and release fishing on LCT, and protection of LCT by utilizing harvest and gear restrictions. The proposed regulation is anticipated to provide sufficient protection of LCT as these waters have a large enough population of LCT to withstand catch and release fishing year-round. This regulation change will have a less than significant effect on LCT.

5) Upper Owens River. On the Upper Owens River from Benton Bridge road crossing upstream to Big Springs, the project proposes to reduce the daily bag limit from two trout to zero trout from the last Saturday in April through November 15. This regulation change will have beneficial effects to LCT. From Benton Bridge road crossing downstream to the Upper Owens River fishing monument, the project proposes to reduce the daily bag limit from 5 trout to 2 trout in August and September. The proposed regulation change will have a less than significant effect on LCT.

6) Mill Creek and tributaries. The project proposes to amend the current fishing regulation on Mill Creek and tributaries in Mono County from closed to fishing to open to fishing all year, with a zero fish bag limit, and gear restricted to artificial lures with barbless hooks. The proposed regulation is anticipated to provide sufficient protection of LCT as these waters are normally inaccessible from December through May and have a large enough population of LCT to withstand catch and release fishing. This proposed regulation change will have a less than significant effect on LCT.

7) Heenan Lake. Heenan Lake is open to fishing on Fridays, Saturdays, and Sundays from the Friday before Labor Day through the last Sunday in October. The project proposes to change the fishing season to September 1 through November 30. The zero trout bag limit and gear restriction will not change. This regulation change will provide additional fishing opportunity on the lake. Recent surveys suggest that the LCT population in Heenan Lake is large and approximately 3,000 LCT are planted back in the lake each year after being spawned in the hatchery. Therefore, the proposed regulation change on Heenan Lake will have a less than significant effect on LCT.

8) Portuguese Creek. The project proposes to change the fishing season on Portuguese Creek from the last Saturday in April through November 15 to the Saturday preceding Memorial Day through the last day in February. The zero trout bag limit and gear restriction will not change. This proposed change will provide additional opportunity for LCT catch and release fishing in the winter and protection for adult spawners in the spring. The proposed regulation is anticipated to provide sufficient protection of LCT as this water has a large enough population of LCT to withstand catch and release fishing during winter. This proposed regulation change will have a less than significant effect on LCT.

9) Independence Lake. The project proposes to amend the fishing regulations on Independence Lake from a five-trout daily bag/10 trout possession limit to a zero trout

bag limit. This regulation change will have a beneficial effect on Lahontan Cutthroat Trout.

10) Other LCT Waters. The project proposes to shorten the fishing season on Convict Creek, Hilton Creek, McGee creek, Robinson Creek, Rush Creek, and Whiskey Creek. The proposed regulation changes on these waters will have beneficial effects on LCT.

b) The project will not have a substantial adverse effect on any riparian habitat or other sensitive natural communities identified in local or regional plans, policies, and regulations, or by the California Department of Fish and Wildlife (Department) or the USFWS because no development of facilities or infrastructure in or near state waters is proposed, and angler use is not anticipated to substantially increase on trout waters where sport fishing regulations will be liberalized. The reasons for this conclusion are discussed below.

Changes to District and Special Trout Fishing Regulations

The project proposes to liberalize sport fishing regulations on many inland trout waters currently regulated under the District General Regulations, Title 14, Section 7.00, and under the Special Fishing Regulations, Title 14, Section 7.50. This includes extending the fishing seasons on many streams currently regulated under the District General Regulations and on approximately 50 streams and 20 lakes regulated under the Special Fishing Regulations. Most of these waters close to fishing on November 15 to protect fall and spring spawning trout. To provide an opportunity for fishing in the winter, the project proposes to extend the fishing seasons on these waters through February or April, with only catch and release fishing allowed on most waters to protect spawning fish. In addition, the project proposes to open five special regulation waters that are currently closed to fishing. All of these waters are expected to receive some level of angler use during the proposed new or extended fishing seasons. However, angler use during these times is expected to be low because: (1) most of the waters are located in sparsely populated areas of the state, (2) many waters are in remote areas, some of which are not easily accessible, if at all, in the winter, and (3) trout anglers are less likely to fish during the winter because cold weather and marginal water temperatures make catching trout difficult.

Changes to Bass Fishing Regulations

The project proposes to amend the bass regulations on lakes and reservoirs in Lassen, Modoc, and Shasta counties, and on Diamond Valley, Silverwood, Skinner, Trinity, and Trout lakes. These waters will be removed from the bass special regulations and will revert to the statewide standard under subsection 5.00(a) of open to fishing all year, with a 12-inch minimum size limit, and a five-fish daily bag limit. The proposed regulation changes are not expected to increase angling pressure on these waters.

Changes to Brook Trout Fishing Regulations

The project proposes to add a new Statewide Regulation for Brook Trout which will allow the harvest of up to 10 Brook Trout less than 10 inches per day in all inland trout waters, year-round. This will expand the current Brook Trout bonus bag limit from waters under the North Coast and Sierra District General Regulations to all inland trout waters under the new Statewide Regulations. Although most Brook Trout fisheries occur in the North Coast and Sierra districts, these wilderness fisheries also occur in other areas of the state, but are

hard to access for most anglers. Because of the remoteness of the Brook Trout fisheries, the proposed regulation change is not expected to increase angling pressure on these waters.

c) The project will not have a substantial adverse effect on state or federally protected wetlands defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means because the Project does not involve any on-the-ground physical changes that would affect wetlands, and because angler use in not anticipated to substantially increase on waters where longer fishing seasons and increased bag limits are proposed.

d) The project will not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites because the Project does not involve any on-the-ground physical changes, and because angler use in not anticipated to substantially increase on waters where longer fishing seasons and increased bag limits are proposed.

e) The project will not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. Such an impact will not occur because the project does not involve any on-the-ground physical changes.

f) The project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan. Such an impact will not occur because it does not propose to develop any lands identified for conservation.

V. CULTURAL RESOURCES.

Would the project:

	I.	II.	III.	IV.
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

CULTURAL RESOURCES – Explanation for Significance

a) The project will not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5. There is no ground disturbing work or work permanently modifying any existing structure or resource and thus no potential to affect historical resources.

b) The project will not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5. There is no ground disturbing work and thus no potential to affect archaeological resources.

c) The project will not disturb any human remains, including those interred outside of formal cemeteries. There is no ground disturbing work and thus no potential to affect human remains.

VI. ENERGY.

Would the project:

	I.	II.	III.	IV.
a) Result in potentially significant environmental impact due to wasteful inefficient, or unnecessary consumption of energy resources, during project construction or operations?	☐	☐	☐	☒
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

ENERGY – Explanation for Significance

a) The project would not result in a potentially significant environmental impact due to wasteful inefficient, or unnecessary consumption of energy resources, during project construction or operations. Such an impact will not occur because the project will not use energy resources.

b) The project will not affect nor obstruct any state or local plan for renewable energy or energy efficiency.

VII. GEOLOGY AND SOILS.

Would the project:

	I.	II.	III.	IV.
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

Significance Codes:

I. Potentially Significant Impact

II. Less than Significant Impact with Mitigation Incorporated

III. Less than Significant Impact

IV. No Impact

GEOLOGY AND SOILS – Explanation for Significance

a i) The project will not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area, or based on other substantial evidence of a known fault. Such an impact will not occur because the project will not create any structures for human habitation.

a ii) The project will not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking. Such an impact will not occur because the project will not create any structures for human habitation.

a iii) The project will not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. Such an impact will not occur because the project will not create any structures for human habitation.

a iv) The project will not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. Such an impact will not occur because the project will not create any structures for human habitation.

b) The project will not result in substantial soil erosion or the loss of topsoil. Such an impact will not occur because the project will not involve any construction, earth moving, or ground clearing activities.

c) The project will not be located on a geologic unit or soil that is unstable, or that would become unstable and potentially result in on- or off- site landslides, lateral spreading, subsidence, liquefaction, or collapse. Such an impact will not occur because the project will not involve and construction, earth moving, ground clearing, or well drilling.

d) The project will not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property. Such an impact will not occur because the project does not create any structures for human habitation.

e) The project will not create any sources of waste water requiring a septic system.

VIII. GREENHOUSE GAS EMISSIONS.

Would the project:

	I.	II.	III.	IV.
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

GREENHOUSE GAS EMISSIONS – Explanation for Significance

a) The project will not generate greenhouse gas emissions, either directly or indirectly, that

may have a significant impact on the environment. The project will not involve construction, land alteration, or land use changes.

Changes to District and Special Trout Fishing Regulations

The project proposes to provide additional fishing opportunities on many waters currently regulated under the District General Regulations, Title 14, Section 7.00, and under the Special Fishing Regulations, Title 14, Section 7.50. These additional fishing opportunities include longer fishing seasons. Many waters will open to year-round fishing to provide fishing opportunity in the winter. As a result, the project could result in additional angler trips to many trout waters throughout the state during the extended fishing seasons on these waters. Vehicles that use fuel will be used to access these waters and their internal combustion engines will produce some greenhouse gas (GHG) emissions. However, the number of additional fishing trips to these waters is anticipated to be low because angler effort is much lower in the winter months than in the summer months due to inclement weather conditions and because trout are less active in the winter, which makes catching trout difficult. Therefore, the small amount of GHG emissions resulting from the project would represent a very small increase over emissions occurring under existing regulations and, thus, would not have a significant impact on the environment.

Changes to Bass Fishing Regulations

The project proposes to amend the bass regulations on lakes and reservoirs in Lassen, Modoc, and Shasta counties, and on Diamond Valley, Silverwood, Skinner, Trinity, and Trout lakes. These waters will be removed from the bass special regulations and will revert to the statewide standard of open to fishing all year, with a 12-inch minimum size limit, and a five-fish daily bag limit. The proposed regulation changes are not expected to result in an increase in the number of fishing trips to these waters.

Changes to Brook Trout Fishing Regulations

The project proposes to add a new Statewide Regulation for Brook Trout which will allow the harvest of up to 10 Brook Trout less than 10 inches per day in all inland trout waters, year-round. This will expand the current Brook Trout bonus bag limit from waters under the North Coast and Sierra District General Regulations to all inland trout waters under the new Statewide Regulations. Although most Brook Trout fisheries occur in the North Coast and Sierra districts, these wilderness fisheries also occur in other areas of the state, but are hard to access for most anglers. Because of the remoteness of the Brook Trout fisheries, the proposed regulation change is not expected to result in an increase in the number of fishing trips to these waters.

b) The project will not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG. The project would result in the production of very low GHG emissions.

IX. HAZARDS AND HAZARDOUS MATERIALS.

Would the project:

	I.	II.	III.	IV.
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

Significance Codes:

I. Potentially Significant Impact

II. Less than Significant Impact with Mitigation Incorporated

III. Less than Significant Impact

IV. No Impact

HAZARDS AND HAZARDOUS MATERIALS – Explanation for Significance

a) The project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The project will not involve the transport, use, or disposal of hazardous materials.

b) The project will not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The project will not involve the transport, use, or disposal of hazardous materials.

c) The project will not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. The project will not involve the transport, use, or emission of any hazardous materials.

d) The project will not be located on any site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

e) The project will not be located within an airport land use plan area.

f) The project will not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. The project will not involve any construction, land alteration, or land use changes.

g) The project will not expose people or structures to a significant risk of loss, injury, or death involving wild land fires. The project will not involve any construction, land alteration, or land use changes.

X. HYDROLOGY AND WATER QUALITY.

Would the project:

	I.	II.	III.	IV.
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☐	☒
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☐	☒
i) result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☐	☒
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage system or provide substantial additional sources of pollution runoff; or	☐	☐	☐	☒
iv) impeded or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒

	I.	II.	III.	IV.
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

Significance Codes:

I. Potentially Significant Impact

II. Less than Significant Impact with Mitigation Incorporated

III. Less than Significant Impact

IV. No Impact

HYDROLOGY AND WATER QUALITY – Explanation for Significance

a) The project will not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. The project will not involve any construction, land alteration, water use, or water discharge.

b) The project will not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. The project will not involve any construction, land alteration, or groundwater use.

c i) The project will not substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river or through the addition of impervious surfaces in a manner which would result in substantial erosion or siltation on- or off-site because the project will not involve any construction or land alteration.

c ii) The project will not substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river or through the addition of impervious surfaces in a manner which would result in flooding on- or off-site because the project will not involve any construction or land alteration.

c iii) The project will not create or contribute runoff water that would exceed the capacity of existing or planned storm-water drainage systems, or provide substantial additional sources of polluted runoff because the project will not involve any construction or land alteration.

d) In flood hazard, tsunami, or seiche zones, the project would not risk release of pollutants due to project inundation because the project would not involve any construction or land alteration.

e) The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. The project will not involve any construction, land alteration, or groundwater use.

XI. LAND USE AND PLANNING.

Would the project:

	I.	II.	III.	IV.
a) Physically divide an established community?	☐	☐	☐	☒

	I.	II.	III.	IV.
b) Cause a significant environmental impact due to a conflict any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

LAND USE AND PLANNING – Explanation for Significance

a) The project will not physically divide an established community. The project will not involve any construction, land alteration, or land use changes.

b) The project does not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The project will not involve any construction, land alteration, or land use changes.

XII. MINERAL RESOURCES.

Would the project

	I.	II.	III.	IV.
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

MINERAL RESOURCES – Explanation for Significance

a) The project will not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. Such an impact will not occur because the project will no excavation or construction will take place.

b) The project will not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. Such an impact will not occur because no excavation or construction will take place.

XIII. NOISE.

Would the project result in:

	I.	II.	III.	IV.
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

NOISE – Explanation for Significance

a) The project will not result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. The regulation changes will provide additional angling opportunity, but most waters are not close to residential areas and will not generate noise levels in excess of agency standards.

b) The project will not result in generation of excessive ground-borne vibration or ground-borne noise levels, because no construction or earthmoving activities are involved.

c) The project will not be located within the vicinity of a private airstrip or an airport use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport.

XIV. POPULATION AND HOUSING.

Would the project:

	I.	II.	III.	IV.
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or	☐	☐	☐	☒

	I.	II.	III.	IV.
indirectly (for example, through extension of roads or other infrastructure)?				
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

POPULATION AND HOUSING – Explanation for Significance

a) The project will not induce substantial unplanned population growth in an area, either directly or indirectly. Such an impact will not occur because the project will not construct any new homes, businesses, roads, or other human infrastructure.

b) The project will not displace any existing people or housing and will not necessitate the construction of replacement housing elsewhere.

XV. PUBLIC SERVICES.

Would the project:

	I.	II.	III.	IV.
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

PUBLIC SERVICES – Explanation for Significance

a) The project will not have any significant environmental impacts associated with new or physically altered governmental facilities. The project will not involve any construction, land alteration, or land use changes.

XVI. RECREATION.

Would the project:

	I.	II.	III.	IV.
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

RECREATION – Explanation for Significance

a) The project will not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

<u>Changers to District and Special Trout Fishing Regulations</u>

The project proposes to liberalize sport fishing regulations on many inland trout waters currently regulated under the District General Regulations, Title 14, Section 7.00, and under the Special Fishing Regulations, Title 14, Section 7.50. This includes extending the fishing seasons on many streams currently regulated under the District General Regulations and on approximately 50 streams and 20 lakes regulated under the Special Fishing Regulations. Most of these waters close to fishing on November 15 to protect fall and spring spawning trout. To provide an opportunity for fishing in the winter, the project proposes to extend the fishing seasons on these waters through February or April, with only catch and release fishing allowed on most waters to protect spawning fish. In addition, the project proposes to open five special regulation waters that are currently closed to fishing.

The project will likely result in additional fishing trips to those waters with new or extended fishing seasons. However, the number of fishing trips is expected to be low because: (1) most of the waters are located in sparsely populated areas of the state, (2) many waters

are in remote areas, some of which are not easily accessible, if at all, in the winter, and (3) trout anglers are less likely to fish during the winter because cold weather and marginal water temperatures make catching trout difficult. While some anglers will take advantage of the new fishing opportunities, existing facilities such as boat ramps and parking lots utilized by anglers are designed for such use and no deterioration would occur or be accelerated. Additionally, the project will not require any new facilities or repurposing of existing facilities.

Changes to Bass Fishing Regulations

The project proposes to amend the bass regulations on lakes and reservoirs in Lassen, Modoc, and Shasta counties, and on Diamond Valley, Silverwood, Skinner, Trinity, and Trout lakes. Currently, lakes and reservoirs in Lassen, Modoc, and Shasta counties are open to fishing year-round, with a five fish bag limit and no size limit for bass. Diamond Valley, Silverwood, and Skinner lakes are also open to fishing year-round with a five fish bag limit, but with a 15-inch minimum size limit. Trinity Lake is open to fishing year-round with a five fish bag limit from June 1 through the last day in February and a two fish bag limit from March 1 through May 31. Trout Lake is open only weekends and Wednesdays form the last Saturday in April through September 30, with a 22-inch minimum size limit, and one fish bag limit. These waters will be removed from the bass special regulations and will revert to the statewide standard under subsection 5.00(a) of open to fishing all year, with a 12-inch minimum size limit, and a five-fish daily bag limit. Except for Trinity Lake and Trout Lake, the fishing seasons and bag limits on these waters will not change. As a result, the project is not expected to result in additional angler/visitor trips to these waters. The project would increase the bag limit on Trinity Lake from two fish to five fish from March through May. As a result, the number of angler trips to the lake could increase during this time. However, because the culture within the bass fishing community is predominantly catch and release, the number of additional anglers/visitors to the lake is expected to be low. Also, while the regulations on Trout Lake will be changed to the Statewide Regulation for trout, the Department's Lands Division manages access to the lake. As a result, the project is not expected to result in a significant increase in the number of anglers/visitors to these waters. Therefore, the project would not have a significant impact on recreation.

Changes to Brook Trout Fishing Regulations

The project proposes to add a new Statewide Regulation for Brook Trout which will allow the harvest of up to 10 Brook Trout less than 10 inches per day in all inland trout waters, year-round. This will expand the current Brook Trout bonus bag limit from waters under the North Coast and Sierra District General Regulations to all inland trout waters under the new Statewide Regulations. Although most Brook Trout fisheries occur in the North Coast and Sierra districts, these wilderness fisheries also occur in other areas of the state, but are hard to access for most anglers. Because of the remoteness of the Brook Trout fisheries, the proposed regulation change is not expected to result in an increase in anglers/visitors to these waters. Moreover, Brook Trout waters are located primarily in the backcountry where there are no recreational facilities. Therefore, the proposed changes to the Brook Trout regulations will not require any new facilities or the repurposing of existing facilities.

b) The project does not require construction or expansion of recreational facilities.

XVII. TRANSPORTATION.

Would the project:

	I.	II.	III.	IV.
a) Conflict with a plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?	☐	☐	☐	☒
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

Significance Codes:

I. Potentially Significant Impact

II. Less than Significant Impact with Mitigation Incorporated

III. Less than Significant Impact

IV. No Impact

TRANSPORTATION – Explanation for Significance

a) The project will not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. The project involves no land use or transportation system modifications.

b) The project will not conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b), which pertains to vehicle miles traveled.

<u>Changers to District and Special Trout Fishing Regulations</u>

The project proposes to liberalize sport fishing regulations on many inland trout waters currently regulated under the District General Regulations, Title 14, Section 7.00, and under the Special Fishing Regulations, Title 14, Section 7.50. This includes extending the fishing seasons on many streams currently regulated under the District General Regulations and on approximately 50 streams and 20 lakes regulated under the Special Fishing Regulations. Most of these waters close to fishing on November 15 to protect fall and spring spawning trout. To provide an opportunity for fishing in the winter, the project proposes to extend the fishing seasons on these waters through February or April, with only catch and release fishing allowed on most waters to protect spawning fish. In addition, the project proposes to open five special regulation waters that are currently closed to fishing.

The project will likely result in additional fishing trips to those waters with new or extended fishing seasons. However, the number of additional fishing trips during winter is expected to be low because: (1) most of the waters are located in sparsely populated areas of the state,

(2) many waters are in remote areas, some of which are not easily accessible, if at all, in the winter, and (3) trout anglers are less likely to fish during the winter because cold weather and marginal water temperatures make catching trout difficult. While some anglers will take advantage of the new opportunity for winter fishing, the amount of vehicle miles traveled by recreational anglers should not change substantially under the proposed regulations.

Changes to Bass Fishing Regulations

The project proposes to amend the bass regulations on lakes and reservoirs in Lassen, Modoc, and Shasta counties, and on Diamond Valley, Silverwood, Skinner, Trinity, and Trout lakes. Currently, lakes and reservoirs in Lassen, Modoc, and Shasta counties are open to fishing year-round, with a five fish bag limit and no size limit for bass. Diamond Valley, Silverwood, and Skinner lakes are also open to fishing year-round with a five fish bag limit, but with a 15-inch minimum size limit. Trinity Lake is open to fishing year-round with a five fish bag limit from June 1 through the last day in February and a two fish bag limit from March 1 through May 31. Trout Lake is open only weekends and Wednesdays form the last Saturday in April through September 30, with a 22-inch minimum size limit, and one fish bag limit. These waters will be removed from the bass special regulations and will revert to the statewide standard of open to fishing all year, with a 12-inch minimum size limit, and a five-fish daily bag limit. Except on Trinity and Trout lakes, the current fishing seasons and bag limits on these waters will not change. As a result, the number of fishing trips to these waters is not expected to increase. The proposed bag limit increase on Trinity Lake from two fish to five fish from March through May is also not expected to result in more fishing trips as the culture within the bass fishing community is predominantly catch and release. While the regulations on Trout Lake will be changed to the Statewide Regulation for trout, the Department's Lands Division manages access to lake including via a Lands Pass or other requirement pursuant to regulations for Wildlife Areas. Consequently, the proposed changes to the bass regulations are not expected to result in a substantial increase in the number of fishing trips to these waters. Therefore, the amount of vehicle miles traveled by recreational anglers should not change substantially under the proposed regulations.

Changes to Brook Trout Fishing Regulations

The project proposes to add a new Statewide Regulation for Brook Trout which will allow the harvest of up to 10 Brook Trout less than 10 inches per day in all inland trout waters, year-round. This will expand the current Brook Trout bonus bag limit from waters under the North Coast and Sierra District General Regulations to all inland trout waters under the new Statewide Regulations. Although most Brook Trout fisheries occur in the North Coast and Sierra districts, these wilderness fisheries also occur in other areas of the state, but are hard to access for most anglers. Because of the remoteness of the Brook Trout fisheries, this change is not expected to result in an increase in the number of fishing trips to these waters. Thus, the amount of vehicle miles traveled by recreational anglers should not change substantially under the proposed regulations.

c) The project will not increase hazards due to a geometric design feature or incompatible uses with equipment. There will be no land use or transportation system modifications.

d) The project will not result in inadequate emergency access. The project involves no land use or transportation system modifications.

XVIII. TRIBAL CULTURAL RESOURCES.

Would the project:

	I.	II.	III.	IV.
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geologically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	☐	☐	☐	☒
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

Significance Codes:

I. Potentially Significant Impact

II. Less than Significant Impact with Mitigation Incorporated

III. Less than Significant Impact

IV. No Impact

TRIBAL CULTURAL RESOURCES – Explanation for Significance

a) The project will not cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k). There is no ground disturbing work and thus no potential to affect tribal cultural resources.

b) The project will not cause a substantial adverse change in the significance of a tribal cultural resource that is determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. There is no ground disturbing work for this project. While various Tribes consider certain fish species to be tribal cultural resources, the impacts to fish species addressed in this regulation are expected to be less than significant

as discussed above. Thus, the project would not have a significant impact on tribal cultural resources.

XIX. UTILITIES AND SERVICE SYSTEMS.

Would the project:

	I.	II.	III.	IV.
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonable foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

Significance Codes:

I. Potentially Significant Impact

II. Less than Significant Impact with Mitigation Incorporated

III. Less than Significant Impact

IV. No Impact

UTILITIES AND SERVICE SYSTEMS – Explanation for Significance

a) The project will not require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunication facilities. There will be no construction or land alteration.

b) The project requires no new water supplies.

c) The project will not produce wastewater.

d) The project will not generate solid waste. Thus, the project will be in compliance with State and local standards for solid waste.

e) The project will not create solid waste. Thus, the project will be in compliance with federal, state, and local management and reduction statutes and regulations related to solid waste.

XX. WILDFIRE.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

	I.	II.	III.	IV.
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel, breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

Significance Codes:

I. Potentially Significant Impact

II. Less than Significant Impact with Mitigation Incorporated

III. Less than Significant Impact

IV. No Impact

WILDFIRE – Explanation for Significance

a) The project will not substantially impair an adopted emergency response plan or emergency evacuation plan because it will not regularly or substantially add to the number of anglers or vehicles in an area with such a plan and does not involve any construction or earth moving activity.

b) The project will not exacerbate wildfire risks due to slope, prevailing winds, and other factors.

c) The regulation changes that comprise the project do not involve the installation or maintenance of any infrastructure.

d) The regulations changes that comprise the project will not result in runoff, post-fire slope instability, or drainage changes.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE.

	I.	II.	III.	IV.
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Significance Codes:
I. Potentially Significant Impact
II. Less than Significant Impact with Mitigation Incorporated
III. Less than Significant Impact
IV. No Impact

MANDATORY FINDINGS OF SIGNIFICANCE – Explanation for Significance

a) The project does not have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. The project is consistent with the Department's mission to manage California's diverse fisheries resources for their ecological value and for their use and enjoyment by the public.

b) The project will not have adverse impacts that are individually limited, but cumulatively considerable. Cumulative adverse impacts will not occur because there are no potential adverse impacts due to project implementation.

c) The project will not have environmental effects that will cause substantial adverse effects on humans, either directly or indirectly. The project will not involve any construction, land alteration, or the creation of new infrastructure.

From: Doug Brown < @gmail.com>
Sent: Wednesday, September 23, 2020 9:41 AM
To: FGC
Subject: Proposed regulation change/ Upper Owens River

Warning: This email originated from outside of CDFW and should be treated with extra caution.

My name is Kelli Brown, I work at the Browns Owens River Campground, I am writing this email to voice my opposition to the proposed change in fishing regulations at the Upper Owens River, from the bridge at Benton Crossing Road south through the Browns Campground. The proposal would stop bait fishing through the campground on July 31. This portion of the Owens River is a valuable resource to our campers, especially kids who are learning to fish, elderly and disabled folks, as the River is easily accessible with limited brush, etc.

This change in regulation will negatively impact our business by cutting our season in half, to our bait fishing campers. Kids need to be able to use bait while learning to fish. Our campground is visited by families who've been coming here for generations, keeping the fishing traditions going with their children.

This proposed change is not fair, as it is singling this stretch of the River out. It seems as though the DFW caters to the special interest fishing groups, ignoring the needs of kids. Please don't let this happen. Keep the regulations the same as they are now, don't take bait fishing from the Upper Owens through Browns Campground away.

Thanks for your consideration, Kelli Brown

From: Edward Pisani < >
Sent: Wednesday, September 23, 2020 9:25 AM
To: FGC
Subject: Proposed Regulation Changes to Fishing on the Upper Owens River

Warning: This email originated from outside of CDFW and should be treated with extra caution.

Dear CA Dept of Fish & Wildlife

I am writing to voice my support to keep regulations as-is for the Upper Owens River and to not change bait fishing to July 31st (keep it thru September). This section of the Owens River is highlighted by the Browns Owens River Campground which is a very family oriented campground where lots of kids learn to fish and catch their first fish. Kelli and Doug Brown have created a wonderful warm, family oriented environment at this campground over the years. I have 3 daughters who all have caught their first fish at this campground, and have many fond memories of them catching fish during our summers at the Owens River.

This change will cause many kids to miss out on catching fish as it is much more difficult without bait. If there is concern that wild trout or spawning trout are getting caught in late summer, I can at least say for myself that I've never caught any wild trout, brown trout, etc... on powerbait or nightcrawlers along this stretch, and I've fished there for the last 10 years. (I've caught plenty of them in Crowley and the other creeks).

Please consider leaving the regulations as-is, mainly for the children. I would have no problem catching and releasing plenty without bait myself but consider the family experience and small children catching their first fish in this area.

Sincerely,

Ed Pisani

From: daniel brown < >
Sent: Wednesday, September 23, 2020 5:38 PM
To: FGC
Subject: Owen's river fish season regulation changes

Warning: This email originated from outside of CDFW and should be treated with extra caution.

Commissioners,

The proposed regulation changes to the stretch of Owen's river south of Benton crossing road is absolutely unacceptable. This stretch of river is constantly changed and scrutinised due to the wishes of the fly fishing community. This is our the citizens of Californias resources. The constant regulation changes including the proposed season changes for bait fishing is unfair and wrong. I learned how to fish on that stretch of river camping at Browns Owen's river campground I taught my children how to fish on the banks of that stretch of river. stop discriminating against bait fisherman it is every Californians fishery not just fly fishermans. The Owen's river is open year round in bishop the entire tmrivers should be open to fishing year round not picking and choosing what some rich elite fly fishing snobs want you to regulate. We pay for fishing lisences for all of California stop regulating our backyard what does it really matter that there is a campground there it provides a safe easily accessible place for young fishermen and women to learn to love the outdoors

Sent from my Verizon, Samsung Galaxy smartphone

Regulation changes

Wed 09/23/2020 09:22 AM

To: FGC <FGC@fgc.ca.gov>

Warning: This email originated from outside of CDFW and should be treated with extra caution.

Good morning. I am writing in regards to the proposed regulation changes to the fishing at the Upper Owens River. This deeply saddens me not only because it will drastically affect my family's business but as well as taking away the enjoyment of all the fisherman that have been coming to our campground for many many years. Most of these people bring their families to enjoy our beautiful river and teach their kids and grandkids how to fish. These kids learn on bait (not fly rods), if this passes you will be hurting more than our business, you will ruin it for those that love to continue to have their family tradition by camping and fishing at this beautiful place. Please re consider changing the regulations.

Thank you for your time.

Lari Brown

REGULATIONS

Terry B. Calsadillas

Wed 09/23/2020 09:43 AM

To: FGC <FGC@fgc.ca.gov>

Warning: This email originated from outside of CDFW and should be treated with extra caution.

Dear Fish & Game,

Sending this e-mail in regards to regulation changes you want to make and encourage you to keep the regulations as they are, below Benton Crossing downstream to the Crowley Lake Monument. DO NOT STOP bait fishing through Browns Owens River Campgrounds!

Best Regards,

Terry B. Calsadillas

Inland Trout Fishing Regulations Comment Letter

Patrick Samuel <psamuel@caltrout.org>

Wed 09/30/2020 04:27 PM

To: FGC <FGC@fgc.ca.gov>
Cc: Michael Wier <MWier@caltrout.org>; Samuel Sedillo <Samuel.Sedillo@tu.org>; Bloom, Roger@Wildlife <Roger.Bloom@wildlife.ca.gov>; Curtis Knight <cknight@caltrout.org>

1 attachments (106 KB)

CT_FGC_TroutRegsSep2020_Final.pdf;

Good afternoon Executive Director Miller-Henson and President Sklar:

Thank you for the opportunity to comment on the proposed inland trout fishing regulations. We appreciate the continued efforts of the Department and Commission to solicit and incorporate stakeholder input in the inland trout regulation simplification process.

In the current proposed regulations before you, there are still a handful of outstanding, iconic trout waters where adjustments are necessary to achieve stated management goals and support wild trout management for future generations. Please find attached proposals to help achieve these objectives .

Thank you for your careful consideration.

Respectfully,
Patrick Samuel

Patrick Samuel
Bay Area Director

CALIFORNIA TROUT
FISH · WATER · PEOPLE

30 September 2020

President Eric Sklar
California Fish and Game Commission
PO Box 944209
Sacramento, CA 94244-2090

RE: California Inland Trout Fishing Regulation Change/Simplification Process

Dear President Sklar:

We are writing you again on behalf of our thousands of members, supporters, partners, and associated angling businesses across California, we thank you for your leadership and collaborative approach in simplifying the new Inland Trout angling regulations. We appreciate the significant efforts by Roger Bloom and his staff at the California Department of Fish & Wildlife to invite public input in this process.

Since our founding 50 years ago, California Trout has championed protection of our sensitive native and wild trout. Our organization fostered the development of the Wild & Heritage Trout Program at the Department of Fish and Game and has been a leader in conservation of salmonids across California for decades. We acknowledge the balancing act before the Department; namely conserving wild trout while increasing angling opportunities, participation in fishing, and maintaining opportunities to harvest trout where appropriate.

Unfortunately, the latest revision to the inland trout fishing regulations as of September 2020 does not adequately protect wild trout fisheries or meet stated management objectives in several world-renowned waters that make California a global fishing destination. For example, the world class Fall River fishery is defined by mostly catch-and-release fly angling. This unique, spring-fed complex of outstanding water resources deserves adequate protection, yet the best available science is not being utilized to inform management of the fishery in the current proposed regulations.

The California Department of Fish & Wildlife, in concert with Fall River Conservancy, California Trout and the UC Davis Center for Watershed Sciences conduct annual mark-recapture surveys and genetic research on the thriving trout population that indicate a significant portion of spawning fish in Bear Creek reside in the Fall River, and are genetically distinct from their counterparts throughout the complex. It is for this reason that we *strongly disagree* with the current proposed regulations for the Fall River and Bear Creek before you.

360 Pine Street, 4th Floor San Francisco CA 94104
Phone: (415) 392-8887 **Fax:** (415) 392-8895 **E-mail:** info@caltrout.org

The current proposed regulations alter the current fishing season and remove the 14" minimum slot limit on trout to protect larger spawning broodstock. Instead, we request that the Commission adopt a unified regulation to adequately protect the genetically distinct trout in the unique Fall River complex, given inadequate population surveys on the Fall River Complex and the latest scientific and genetic information from UC Davis:

- **Fall River Complex** including Ahjumawi, Eastman Lake, Lava Springs, etc. and Bear Creek – We propose year-round angling season with barbless, artificial lures only; 0 fish daily bag (**Option A, #6**).

We also wish to reiterate our prior written and oral comments for the following waters:

- **Truckee River:** We propose adopting a year-round catch and release angling with artificial flies with barbless hooks (**Option A, #7**) for the reach from Trout Creek to Prosser Creek. This proposal would simplify the regulations for this reach by making them consistent with the existing fly-fishing-only reach from Glenshire Bridge to the Highway 80 Bridge while adequately protecting wild trout.
  From Lake Tahoe to Trout Creek in Truckee and from Prosser Creek downstream to the Nevada state line, we request adoption of year-round catch and release angling only with artificial, barbless lures (**Option A, #6**). This regulation would help support sensitive wild trout populations, support angling-associated businesses and guides, and achieve the objectives of the Wild and Heritage Designation of the river.

- **Upper Sacramento River:** Rather than using three different regulations for this river currently, we recommend adopting a unified regulation to support this wild trout-dominated fishery: year-round, 2 fish bag, barbless artificial lures only (**Option A, #3**). This would maintain harvest opportunities while adequately protecting the large spawning fish that migrate up from Shasta Lake and throughout the lower river downstream of Dunsmuir. This regulation will meet the primary management objective of the 2000 *Fishery Management Plan for the Upper Sacramento River*:

- **East Walker River:** We are advocating for catch and release angling year-round with barbless artificial lures (**Option A, #6**) on this very popular trophy wild trout fishery.

- **Mokelumne River:** We propose catch and release angling year-round with artificial, barbless lures (**Option A, #6**) from the Highway 49 Bridge downstream to Lake Pardee at Middle Bar Bridge. There are currently no catch and release fisheries in the Sierra Foothills, and it would serve to fill that gap.

- **East Fork Carson River**: We recommend maintaining catch and release regulations with artificial lures and barbless hooks (**Option A, #6**) below Hangman Bridge to the Nevada state line. Under this proposal, this trophy trout fishery will continue to draw anglers to contribute to the local economy of Alpine County and meet stated management goals of the 1979 *East Fork Carson River Wild Trout Management Plan*.

Thank you for your careful consideration of these proposed amendments to the proposed revised inland trout fishing regulations. We look forward to continuing to work with you and the Department of Fish & Wildlife to ensure that California's wild trout continue to thrive now and into the future.

Respectfully,

Patrick Samuel

Bay Area Director
California Trout

360 Pine Street, 4th Floor San Francisco CA 94104
Phone: (415) 392-8887 **Fax:** (415) 392-8895 **E-mail:** info@caltrout.org

October 14, 2020 Fish and Game Commission Meeting -- Comments of Fall River Conservancy on Proposed Simplification of State Inland Sport Fishing Regulations

Peck, Rodney R. <rodney.peck@pillsburylaw.com>

Tue 09/29/2020 04:32 PM

To: FGC <FGC@fgc.ca.gov>

1 attachments (67 KB)

M1190417202737710700.pdf;

Dear Commissioners: On behalf of the Fall River Conservancy ("FRC"), Fall River Mills, California, attached please find the comments of the FRC on the Proposed Simplification of State Inland Sport Fishing Regulations, which we understand will be considered at the October 14, 2020, meeting of the California Fish and Game Commission. Thank you for considering these comments.

Sincerely,

Rodney R. Peck
President
Fall River Conservancy

FALL RIVER CONSERVANCY
Post Office Box 395
Fall River Mills, CA 96028

September 29, 2020

To: California Fish and Game Commission (the "Commission")

Re: Proposed Changes to California Inland Trout Angling Regulations; Commission Meeting – October 14, 2020

The Fall River Conservancy (the "FRC") submits these comments to the Commission regarding the California Department of Fish and Wildlife's ("CDFW") proposed changes to the California inland trout angling regulations from the perspective of the impact of such changes on the Fall River in Shasta County. The FRC is a California corporation qualified as a tax-exempt charitable organization under Section 501(c)(3) of the Internal Revenue Code. The FRC's mission is to preserve and enhance the Fall River and the surrounding valley in Shasta County. The FRC is supported by individual and other donations from several hundred donors. Its members include many long-time landowners in and around the Fall River Mills community.

The Fall River is one of the largest spring-feed river systems in the Western United States and its distinct species of rainbow trout present a unique and very high-quality angling experience. Under the protection of the existing regulations, the fishery of the Fall River and related tributaries (the "Fall River Complex") has consistently sustained a robust trout population including many trophy specimens, in spite of challenges from heavy sedimentation in the upper reaches of the river from a wildfire several decades ago.

The FRC has reviewed the extensive comments submitted to the CDFW by California Trout ("Cal Trout") and generally agrees with the recommendations of Cal Trout regarding the Fall River Complex. Specifically, we agree that the Fall River Complex should be protected by a zero-bag limit and a requirement for artificial flies or lures with barbless hooks. (We differ slightly with the Cal Trout recommendation for the Tule River and related waters in that we think barbless hooks should be required for those waters as well.) However, we would respectfully submit to the Commission and the CDFW that allowing all-year angling would likely present a serious risk of impairing the spawning season in the Fall River Complex, especially in the upper reaches downstream from Thousand Springs. Based on the genetics study led by the University of California at Davis (together with the CDFW, Cal Trout and the FRC) and the related passive integrated transponder ("PIT") project, it appears that more than 30% of the fish population moves into the upper reaches of the Fall River during the spawning season (essentially February through March in the upper river). Given the small size of the river in that reach, the spawning population is especially vulnerable to any angling. In particular, fisherman wading through the spawning beds

in the Bear Creek tributary will have a devastating effect on spawning activity. Accordingly, the best available science favors retaining the status quo as to the fishing season on the Fall River, i.e., from the last Saturday in April to November 15th, and particularly in the upper spawning reaches. We further note that the elevation of some 3,000 feet and northern latitude of the Fall River essentially renders the fishery dormant during the winter months throughout much of the river.

We would also note that the Fall River has a robust water fowl hunting season commencing in the late Fall. Opening the river to unlimited angling during the water fowl season clearly presents public safety and other concerns.

In addition, the FRC notes that two of the spring-fed headwaters of the Fall River are not privately-owned and are open at this time to public fishing. These are Ahjumawi Lava Springs and Eastman Lake. The Ahjumawi Lava Springs are located at the state park of the same name which is accessible to the public only by boat. The Springs constitute a very small body of water with particular fragility. These waters are home to some of the largest native rainbow trout in California. In historical times, the Native American Achomawi tribe, for which the park and Springs are named, carefully tended these waters, monitoring spawning beds and limiting their catches to conserve populations of the fish they used for food. Brochure: Ahjumawi Lava Springs State Park. (http://www.parks.ca.gov/pages/464). Regrettably, at present, fisherman are allowed to use bait and lures in these waters to catch and kill these large fish. This is a significant impact on the biodiversity of the Fall River and an unacceptable use of these unique waters. The FRC strongly believes that these very special bodies of water should be protected by the same angling regulations that apply to the other parts of the Fall River Complex. We urge the Commission to include them in the regulations.

We appreciate the opportunity to submit these comments. If the Commission would like to contact the FRC regarding this matter, please contact the undersigned at the above address.

Very truly yours,

Rodney R. Peck
President
Fall River Conservancy

State of California
Department of Fish and Wildlife

Original on file,
received July 16, 2020

Memorandum

Date: July 13, 2020

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: **Five-Year Species Review of Kenwood Marsh checkerbloom**

The California Department of Fish and Wildlife (Department) has prepared the attached Five-Year Species Review of Kenwood Marsh checkerbloom for the Fish and Game Commission (Commission) pursuant to the California Endangered Species Act (CESA). Pursuant to Fish and Game Code, section 2077, subdivision (a), the Department has prepared this Five-Year Species Review to evaluate whether conditions that led to the original listing of Kenwood Marsh checkerbloom are still present.

In completing this Five-Year Species Review, the Department finds there is sufficient scientific information to indicate that the conditions that led to the original listing of Kenwood Marsh checkerbloom as endangered are still present. The scientific information available to the Department indicates that Kenwood Marsh checkerbloom remains in serious danger of extinction in all of its range due to one or more causes. Therefore, the Department recommends no change to the status of Kenwood Marsh checkerbloom.

The Department requests that the following item be added to the Commission's August 19-20, 2020 meeting agenda:

- **Kenwood Marsh checkerbloom**
  Receive the Department's Five-Year Species Review of Kenwood Marsh checkerbloom (*Sidalcea oregana* ssp. *valida*), a native plant listed as endangered under CESA. (Pursuant to Section 2077, Fish and Game Code)

If you have questions or need additional information, please contact Isabel Baer, Environmental Program Manager, Native Plant Program, Habitat Conservation Planning Branch at (916) 203-3193, or by e-mail at Isabel.Baer@wildlife.ca.gov.

Enclosure

ec: California Department of Fish and Wildlife

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Original on file,
received September 17, 2020

Correction to
Five-year Species Review of Kenwood Marsh Checkerbloom
(*Sidalcea oregana* ssp. *valida*)

In the five-year species review for Kenwood Marsh checkerbloom, a report from the Department of Fish and Wildlife to the Fish and Game Commission dated August 2020, there was an error in the "Management and Recovery" section on page 15. The review stated that: "As part of the agreement, a permanent conservation easement was recorded in April 2007." This statement is incorrect and should be stricken from the document. A conservation easement was not placed on the property in 2007, or in any other year. The original document has been replaced with one where this sentence is struck through. This erratum is dated September 17, 2020.

State of California
Natural Resources Agency
Department of Fish and Wildlife

REPORT TO THE FISH AND GAME COMMISSION

FIVE-YEAR SPECIES REVIEW OF KENWOOD MARSH CHECKERBLOOM (*Sidalcea oregana* ssp. *valida*)

August 2020

Kenwood Marsh checkerbloom, CDFW photo by Raffica La Rosa

Charlton H. Bonham, Director
Department of Fish and Wildlife

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I. EXECUTIVE SUMMARY

Kenwood Marsh checkerbloom (*Sidalcea oregana* ssp. *valida* Greene) is currently listed as endangered under the California Endangered Species Act. Pursuant to Fish and Game Code, section 2077, subdivision (a), the California Department of Fish and Wildlife (Department) has prepared this Five-Year Species Review to evaluate whether conditions that led to the original listing of Kenwood Marsh checkerbloom are still present. This review is based on the best scientific information currently available to the Department regarding each of the components listed under Section 2072.3 of the Fish and Game Code and Section 670.1, subdivisions (d) and (i)(1)(A), of Title 14 of the California Code of Regulations. In addition, this document contains a review of the identification of habitat that may be essential to the continued existence of the species, and the Department's recommendations for management activities and other recommendations for recovery of the species (Fish & G. Code, § 2077, subd. (a)).

Kenwood Marsh checkerbloom is a long-lived perennial herb in the mallow family (Malvaceae) and is about 1 m (3.3 ft) tall with pink flowers. This species is endemic to (exists only in) California, and its range appears to be restricted to eastern Sonoma County in Kenwood Marsh and Knights Valley. When Kenwood Marsh checkerbloom was state-listed as an endangered species in 1982, it was known from only three sites in marshes adjacent to grasslands that top ancient sandstone and river deposits. All three sites are on privately owned land, and since 2001, the species has been confirmed as extant at only one site. This site in Kenwood Marsh produced only 16 flowering plants in 2019. Due to its very small population size, Kenwood Marsh checkerbloom is vulnerable to several threats and is at risk of extinction.

At the time of listing in 1982, the Department described one major threat to the survival and reproduction of Kenwood Marsh checkerbloom: present or threatened modification or destruction of its habitat. The destruction of habitat came in the form of agricultural conversion to vineyards and pasture, plus the urbanization of areas adjacent to Kenwood, CA. Today, the last three documented populations are isolated and surrounded by vineyards or residences. This isolation likely eliminates the ability of the species to move in response to climate change and also increases the chance that random events will extirpate any small population. Kenwood Marsh checkerbloom relies on wetland habitat and is therefore susceptible to changes in hydrology from agriculture, water diversion, and climate change.

Landowner actions to protect the species from grazing and mowing have contributed to the survival of the one confirmed extant population of Kenwood Marsh checkerbloom in Kenwood Marsh. Kenwood Marsh checkerbloom has benefited from coordination between the landowner, the U.S. Fish and Wildlife Service, the University of California Botanical Garden, volunteers, and the Department to collect seeds for long-term conservation, perform activities to reduce competition from nearby vegetation, and reintroduce the species into nearby suitable habitat. The Department recommends the re-initiation of reintroduction efforts, with an additional goal of quantifying the genetic diversity of the remaining natural population, the cultivated plants that the reintroductions are drawn from, and the seed-banked seeds in long-term storage, with the purpose of applying this knowledge of the remaining genetic diversity to maximize the genetic diversity of the plants used in reintroduction efforts.

In completing this Five-Year Species Review for Kenwood Marsh checkerbloom, the Department finds there is sufficient scientific information to indicate that the conditions that led to the listing of Kenwood Marsh checkerbloom as endangered are still present, and recommends no change to its status at this time.

II. INTRODUCTION

A. FIVE-YEAR SPECIES REVIEW

This Five-Year Species Review addresses Kenwood Marsh checkerbloom (*Sidalcea oregana* ssp. *valida* Greene), which is designated as an endangered species under the California Endangered Species Act (CESA) (Fish and G. Code, § 2050 et seq.; Cal. Code Regs. tit. 14 § 670.2, subd. (a)(20)(D)). This subspecies will be referred to as a species throughout this document for ease of reference. Upon a specific appropriation of funds by the Legislature, the California Department of Fish and Wildlife (Department) shall, or if other funding is available, in the absence of a specific appropriation, may, review species listed as endangered or threatened under CESA every five years to determine if the conditions that led to the original listing are still present (Fish and G. Code, § 2077, subd. (a)). Kenwood Marsh checkerbloom is also listed as endangered under the Federal Endangered Species Act. Pursuant to Fish and Game Code, section 2077, subdivision (b), the United States Department of the Interior, U.S. Fish and Wildlife Service (USFWS) was contacted in an effort to coordinate this review with their five-year review process, which was last completed in 2019 (Bainbridge, pers. comm. 2019a; USFWS 2019).

Using the best scientific information available to the Department, this Five-Year Species Review includes information on the following components pursuant to the Fish and Game Code, sections 2072.3 and 2077, subdivision (a) and of Title 14, California Code of Regulations, section 670.1, subdivision (d): species' population trend(s), range, distribution (including a detailed distribution map), abundance, life history, factors affecting the species' ability to survive and reproduce, the degree and immediacy of threats, the impact of existing management efforts, the availability and sources of information, identified habitat essential for the continued existence of the species, and the Department's recommendations for future management activities and other recovery measures to conserve, protect, and enhance the species.

B. LISTING AND STATUS REVIEW HISTORY

On November 5, 1981, the Fish and Game Commission voted to list Kenwood Marsh checkerbloom as endangered and protected under the Native Plant Protection Act (NPPA) (Fish and G. Code, § 1900 et seq.), effective January 17, 1982 (Cal. Reg. Notice Register 81, No. 51).

In 1984, plants listed as endangered under the NPPA were newly designated as endangered under CESA and added to the CESA list of endangered plants (Cal. Code Regs., tit. 14, § 670.2, subd. (a)(20)(D); Fish and G. Code, § 2062). At the time of listing, the main threat to the species was identified as modification and/or destruction of habitat due to human-related activities (e.g., agricultural conversions and urbanization).

On October 22, 1997, the USFWS listed Kenwood Marsh checker-mallow (synonym of Kenwood Marsh checkerbloom) as endangered under the authority of the federal Endangered Species Act.

The last 5-year species review was conducted by the Department in 1987. This current Five-Year Species Review was prepared by Dr. Raffica La Rosa, in the Department's Habitat Conservation Planning Branch, Native Plant Program.

C. Notifications and Information Received

On November 26, 2019, the Department notified persons who had expressed their interest in CESA actions in writing to the Commission and had provided contact information to the Commission (Fish and G. Code, § 2077(a)). The e-mail notification included a link to the Department's dedicated web page for five-year species reviews of threatened and endangered species at https://www.wildlife.ca.gov/Conservation/CESA/Five-Year-Reviews.

III. BIOLOGY

A. Taxonomic and Physical Description

Kenwood Marsh checkerbloom is a perennial herb that forms a thick fleshy root and can grow to about 1 m (3.3 ft) tall (Munz and Keck 1959; Hill 2012). The lower stem has bristles that are 1-1.5 mm long (Hill 2012). The leaves are palmately lobed; at the base of the plant, the leaves typically have 5-7 shallow lobes and further up the branches, the leaves have 3-5 deep lobes (Fig. 1). The flowers are pink, each with five petals 10-15 mm long and a fused column of stamens. The flowers form dense clusters that are 2-6 cm (0.8-2.4 in) long at the ends of the branches, with the youngest flowers near the tips. (CDFG 1981, 1987)

There are currently five recognized subspecies of *Sidalcea oregana*, which collectively are found across northern California. These subspecies are distinguishable by their flower density, length of flower clusters, and density of bristles on the stems (Hill 2012). Three of the subspecies are rare and imperiled in California (CNPS 2019b), but Kenwood Marsh checkerbloom is the only one that is state-listed. The subspecies became distinct relatively recently, therefore the evolutionary relationships between subspecies is still difficult to discern (Andreasen and Baldwin 2003). The closest relative of Kenwood Marsh checkerbloom may be the coast checkerbloom (*S. oregana* ssp. *eximia*), which grows in Humboldt County (CDFG 1987); their distributions do not overlap.

B. Life History and Ecology

Almost all that is known about the life history and ecology of Kenwood Marsh checkerbloom is the result of studying the Deerfield Ranch Winery population in Kenwood Marsh (Table 1). The plants are likely long-lived if conditions are suitable, but are difficult to track annually (Symonds, pers. comm. 2020). There is anecdotal evidence that isolated individuals cannot produce seeds (Parsons, pers. comm. 2019), which suggests that Kenwood Marsh checkerbloom relies on pollinators to move pollen between at least two genetically dissimilar plants for seeds to be produced. If true, this would have negative implications for the survival of populations with extremely low numbers of individuals, especially if they are genetically very similar.

The Department has no information on pollinators of Kenwood Marsh checkerbloom, but the closely related Oregon checkerbloom (*Sidalcea oregana* ssp. *spicata*), a species with similar floral characteristics to Kenwood Marsh checkerbloom, was observed to be pollinated by bumble bees (*Bombus* spp.), bee flies (Bombyliidae, Diptera), and skipper butterflies (Hesperiidae, Lepidoptera) (Ashman and Stanton 1991). Kenwood Marsh checkerbloom may attract a similar suite of pollinators because these pollinators are typically generalists that visit many species of plants and could possibly pollinate other checkerbloom species. Ashman and Stanton (1991) also observed visits from a solitary oligolectic bee (*Diadasia nigrafrons*) to Oregon checkerbloom. This is a bee that specializes on pollen from only one or a few plant

species. There is no evidence that this species of solitary bee visits Kenwood Marsh checkerbloom, but there may be other solitary bee species that interact with Kenwood Marsh checkerbloom in a similar way.

Seeds from Kenwood Marsh checkerbloom drop from the plant, and it is not known how long they can remain viable in the soil seedbank. In the spring, many seeds that were produced in the previous year may germinate (Symonds, pers. comm. 2020), but the seedlings must compete with the surrounding vegetation. In a nursery setting without competition, plants have produced flowers after just one year of growth (Symonds, pers. comm. 2019). Once a plant is established and has produced a substantial rootstock, it may better withstand interannual fluctuations of precipitation and competition from surrounding vegetation, but a large rootstock would likely not withstand sustained changes, such as prolonged droughts.

Kenwood Marsh checkerbloom occurs in freshwater wetlands that have a history of grazing (CDFG, in litt. 1999). If grazers are present, plants are susceptible to damage at any time of year. Grazers may eat the vegetative or reproductive portions of the plant or could damage the roots that are sometimes exposed and vulnerable to trampling (Symonds, pers. comm. 2020). Grazers may also help to reduce the surrounding vegetation that may compete with Kenwood Marsh checkerbloom for resources, so their net benefit is unknown.

(a) **(b)**

FIGURE 1. Photos of Kenwood Marsh checkerbloom (a) vegetative plant and (b) flowers. Photos by Kate Symonds (left) and Josh Hull (right).

TABLE 1. Populations of Kenwood Marsh checkerbloom (*Sidalcea oregana* ssp. *valida*).

EO[1]	Population	Status	Last Monitored	Ownership	Parcel[2]	Land use category[3]
1	Deerfield Ranch Winery	Extant, but low numbers	2019[4]	Private	050-240-32	Industrial - Winery
1	Kenwood Marsh-West	Unknown	1998[1]	Private	050-240-06	Agricultural - Pasture
2	Knights Valley	Unknown	2001[5]	Private	120-110-12	Agricultural - Vineyard

[1] Element Occurrence, (CNDDB 2019)
[2] Assessor's Parcel Number
[3] Taken from county parcel ownership data
[4] (La Rosa, pers. obs. 2019)
[5] (Cooley, in litt. 2001)

C. HABITAT NECESSARY FOR SPECIES SURVIVAL

Kenwood Marsh checkerbloom occurs on the edges of freshwater marshes (Munz and Keck 1959) and does not persist in areas that are inundated for extended periods (USFWS 2013). It currently exists in pockets of habitat surrounded by vineyards that were planted or expanded in the 1990s. The three Kenwood Marsh checkerbloom populations are recorded as two occurrences in the CNDDB, one occurrence (two populations) in Kenwood Marsh and one occurrence (one population) in Knights Valley (Table 1; CNDDB 2019).

i. VEGETATION COMMUNITIES

Sonoma County has not yet been mapped to species alliances using the California Vegetation Classification System (CNPS 2019a), but the Sonoma County Agricultural Preservation & Open Space District produced a fine scale vegetation and habitat map of Sonoma County which identified vegetation types using the National Vegetation Classification System (NVCS) and a combination of landscape imagery from 2013 and ground truthing (SCAPOSD 2017). The habitat types that were identified in the vicinity of Kenwood Marsh checkerbloom populations were classified to the scale of macrogroups, which are vegetation classifications of intermediate rank that are defined by a combination of diagnostic plant species that can reflect regional differences (FGDC 2008). The three Kenwood Marsh checkerbloom populations are at the interface of the Western North American Freshwater Marsh Macrogroup and the California Annual and Perennial Grassland Vegetation Macrogroup, a combination that is relatively uncommon in the county (Modeled Species Habitat, Fig. 2). Suitable habitat for Kenwood Marsh checkerbloom within Sonoma County based on vegetation type was modeled by Habitat Conservation Planning Branch staff. Suitable species habitat was defined as Western North American Freshwater Marsh Macrogroup that is adjacent to, and within 30.5 m (100 ft) of, California Annual and Perennial Grassland Macrogroup. The total modeled species habitat was 973 ha (2404 acres) (Fig. 2), which is only about 0.23% of the total area of Sonoma County.

Other naturally occurring NVCS vegetation types within approximately 100 m (328 ft) of all of the populations are the *Quercus lobata* Alliance, the Vancouverian Riparian Deciduous Forest Group, and either the Southwestern North American Riparian Evergreen and Deciduous Woodland Group or the Southwestern North American Riparian/Wash Scrub Group. Groups describe sets of diagnostic plants more narrowly defined than macrogroups, and alliances are narrower still (FGDC 2008).

Broadly, the species associated with the Kenwood Marsh checkerbloom have likely shifted over the past 40 years from changes in hydrology, adjacent land use, and grazing regime. The subpopulations within the Deerfield Ranch Winery population also differ in soil moisture and light availability. The associated species that have been observed with one or more populations since the time of listing include: creeping St. John's wort (*Hypericum anagalloides*), hardstem bulrush (*Schoenoplectus acutus* var. *occidentalis*), Himalayan blackberry (*Rubus armeniacus*), pennyroyal (*Mentha pulegium*), rush (*Juncus* sp.), sedges (*Carex* spp.), slough sedge (*Carex obnupta*) or valley sedge (*Carex barbarae*), smartweed (*Polygonum* sp.), sneezeweed (*Helenium puberulum*), teasel (*Dipsacus* sp.), velvetgrass (*Holcus lanatus*), and willows (*Salix* spp.) including arroyo willow (*Salix lasiolepis*) (Guggolz and Guggolz 1986; USFWS 2007; USFWS 2009; CNDDB 2019; Symonds pers. comm. 2019; USFWS 2019).

ii. Geology and Soils

Both marshes that support Kenwood Marsh checkerbloom overlay relatively young geological substrates from the Pleistocene Epoch of the Quaternary Period that are less than two million years old (CDOC 2010). The underlaying rock is composed of deposits of sandstone, shale, gravel, and other alluvial deposits from ancient bodies of water (CDOC 2010). Figure 2 overlays the potential suitable habitat of Kenwood Marsh checkerbloom based on vegetation type with the geologic deposits that are associated with the known sites (Appendix A). The overlap of these two components, vegetation and geology, predict the areas that might support Kenwood Marsh checkerbloom or be suitable for reintroductions.

The soils of both marshes share characteristics of texture, mixing, and cation activity (Appendix B). The soil series Huichica and Los Robles that underlie Kenwood Marsh and Knights Valley, respectively, are both described as having fine-loamy texture with mixed topsoil and superactive cation activity (Soil Survey Staff 2019).

iii. Climate and Hydrology

Kenwood Marsh checkerbloom grows in a Mediterranean climate that is characterized by hot, dry summers and cool, wet winters. Based on 30 years of temperature and precipitation data between 1981-2010, gathered from local weather stations near the natural populations, the estimated annual rainfall total is between 89-104 cm (35-41 in) (PRISM Climate Group 2004). The estimated monthly average high/low temperatures range from 13.9°/3.3°C (57°/38°F) in December and January to 31.1°/12.2°C (88°/54°F) in July (PRISM Climate Group 2004). Plants bloom June-September during the driest months of the year when the average monthly rainfall is less than 1 cm (0.4 in) and the average high/low temperature is 30.0°/11.7°C (86°/53°F).

Kenwood Marsh checkerbloom occurs around 120 m (400 ft) elevation (Hill 2012) in areas that are gently sloped (1-5 degrees) (Esri 2019), and where water runoff and permeability is typically slow (Soil Survey Staff 2001, 2003). In 1993, the State Water Resources

Control Board, Division of Water Rights determined that Kenwood Marsh was fed by both surface and groundwater flows (Turner 1993; Wilcox, in litt. 1994). An unnamed stream that fed into Kenwood Marsh was susceptible to water diversions for agricultural purposes (e.g., irrigating vineyards) and had sometimes been diverted to the point that the streambed was a dry channel (Turner 1993). The source of water that feeds the marsh in Knights Valley, where the Kenwood Marsh checkerbloom is also recorded, remains unknown.

IV. DISTRIBUTION AND ABUNDANCE

A. RANGE AND DISTRIBUTION

The first collection of Kenwood Marsh checkerbloom was from Knights Valley and was described by William H. Brewer in 1861, and later named by Edward L. Greene (1897). The three populations of Kenwood Marsh checkerbloom are all at around 120 m (400 ft) in elevation, but the possible range of suitable elevations is unknown because the original extent of the species range is not known. Given that the populations occur on sandstone and alluvial deposits, Kenwood Marsh checkerbloom may be restricted to low elevation sites with a geologic history as ancient seabed.

The range of Kenwood Marsh checkerbloom is extremely small. The species is restricted to Sonoma County and is known from only two locations: Kenwood Marsh near Kenwood, CA, and Knights Valley near Kellogg, CA which is about 29 km (18 mi) northwest of Kenwood Marsh. Kenwood Marsh once covered a much larger area, but the growth of the town of Kenwood and the expansion of vineyards west of town drastically reduced the habitat for Kenwood Marsh checkerbloom over the past 70 or more years. The two small populations at Kenwood Marsh are on adjacent privately-owned parcels with different owners. The population at Knights Valley is less than 0.1 ha (0.25 acre) in area (USFWS 2009) and is also privately owned.

TABLE 2. Deerfield Ranch Winery subpopulations of Kenwood Marsh checkerbloom (*Sidalcea oregana* ssp. *valida*) (Symonds, pers. comm. 2020).

Subpopulation	Flowering plants in 2019	Light	Type	Notes
Road	16	Full sun	Natural	Unknown number of immature plants present.
Willow	0	Shaded	Natural	No longer supports Kenwood Marsh checkerbloom
#3	0	Shaded	Introduced	Mimics surrounding vegetation of “Willow” subpopulation.
#4	0	Full sun	Introduced	Mimics surrounding vegetation of “Road” subpopulation.

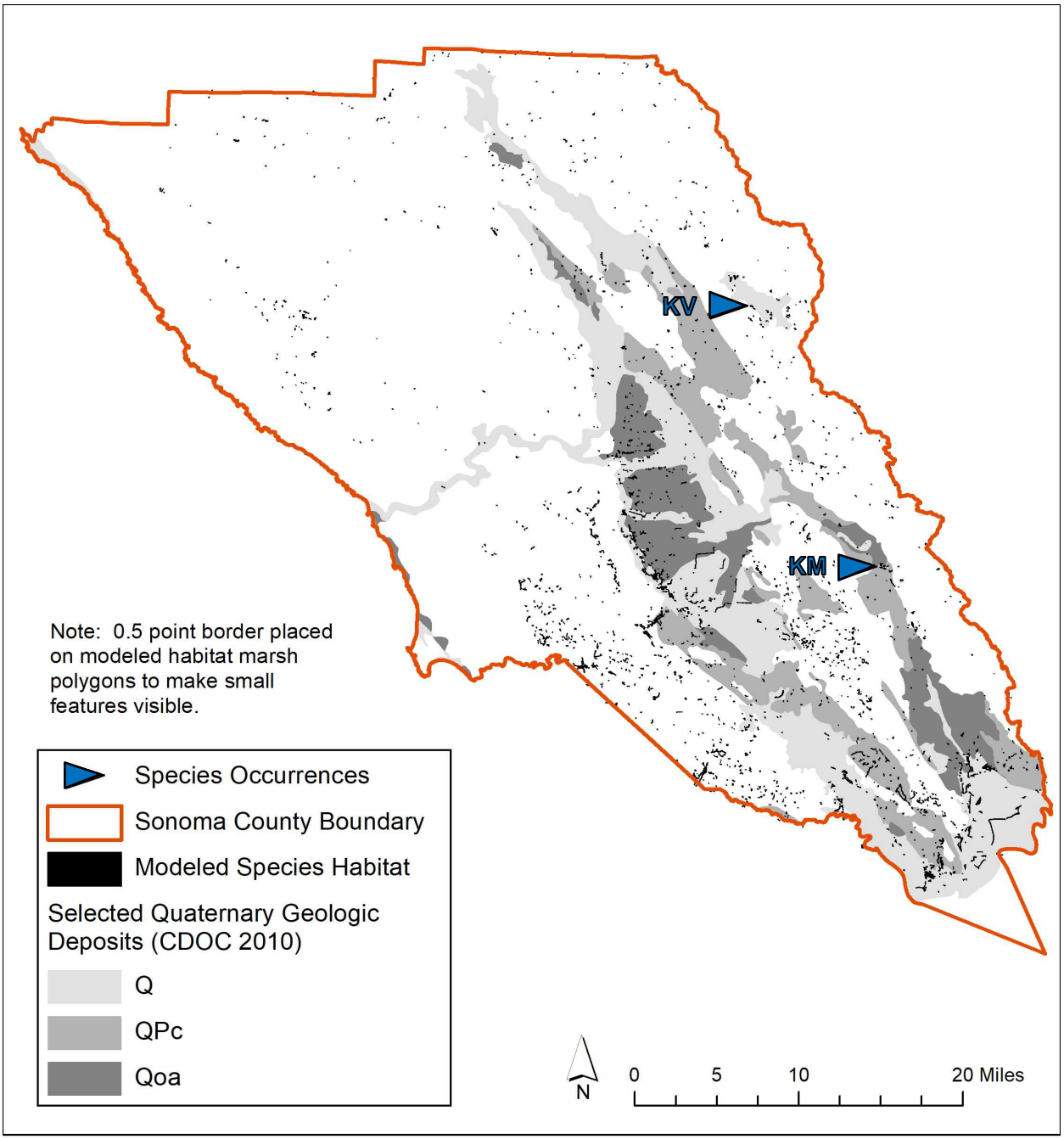

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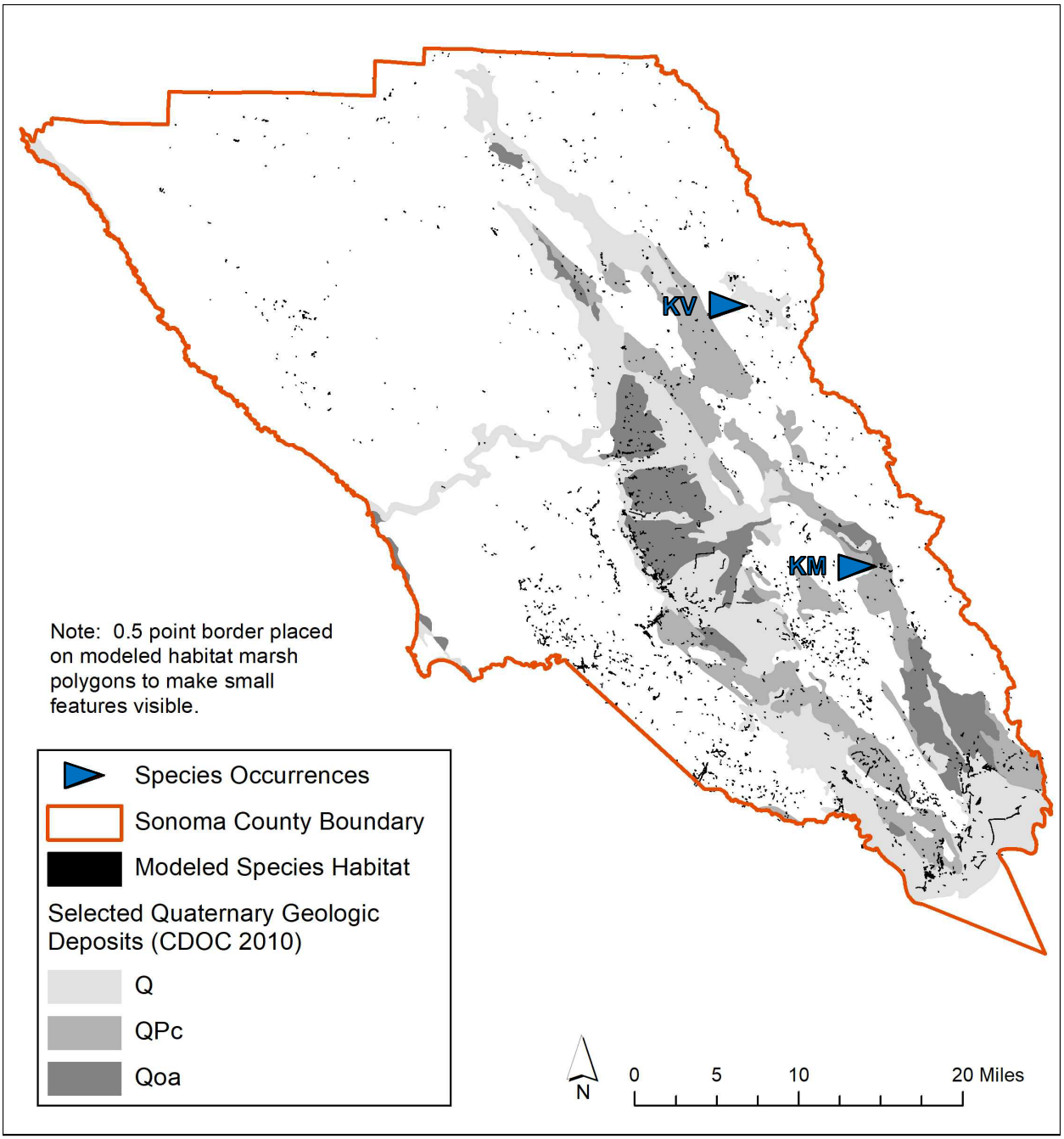
FIGURE 2. Modeled suitable habitat for Kenwood Marsh checkerbloom in Sonoma County. Potential suitable habitat was modeled by CDFW based on the vegetation types and geologic substrates associated with Kenwood Marsh checkerbloom. Black represents portions of Western North American Freshwater Marsh Macrogroup vegetation that is within 30.5 m (100 ft) of adjacent California Annual and Perennial Grassland Macrogroup vegetation. A 0.5 point border was added to all patches to make small features visible. Shades of gray represent types of geologic deposits that are associated with the known sites (Appendix A). The overlap of these two layers, vegetation and geology, predict the areas that might best support Kenwood Marsh checkerbloom, or be suitable for reintroductions. Kenwood Marsh (KM) and Knights Valley (KV) are identified by blue arrows.



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The distribution of Kenwood Marsh checkerbloom is documented within the California Natural Diversity Database (CNDDB). The CNDDB documents “elements,” which are plant or animal taxa, or natural communities that are of conservation concern within California. For plants, an “element occurrence” (EO) is a location record for a site which contains an individual, population, or “colony” of a special status element. Populations, individuals, or colonies that are located within 1/4 mile of each other generally constitute a single occurrence (Bittman 2001).

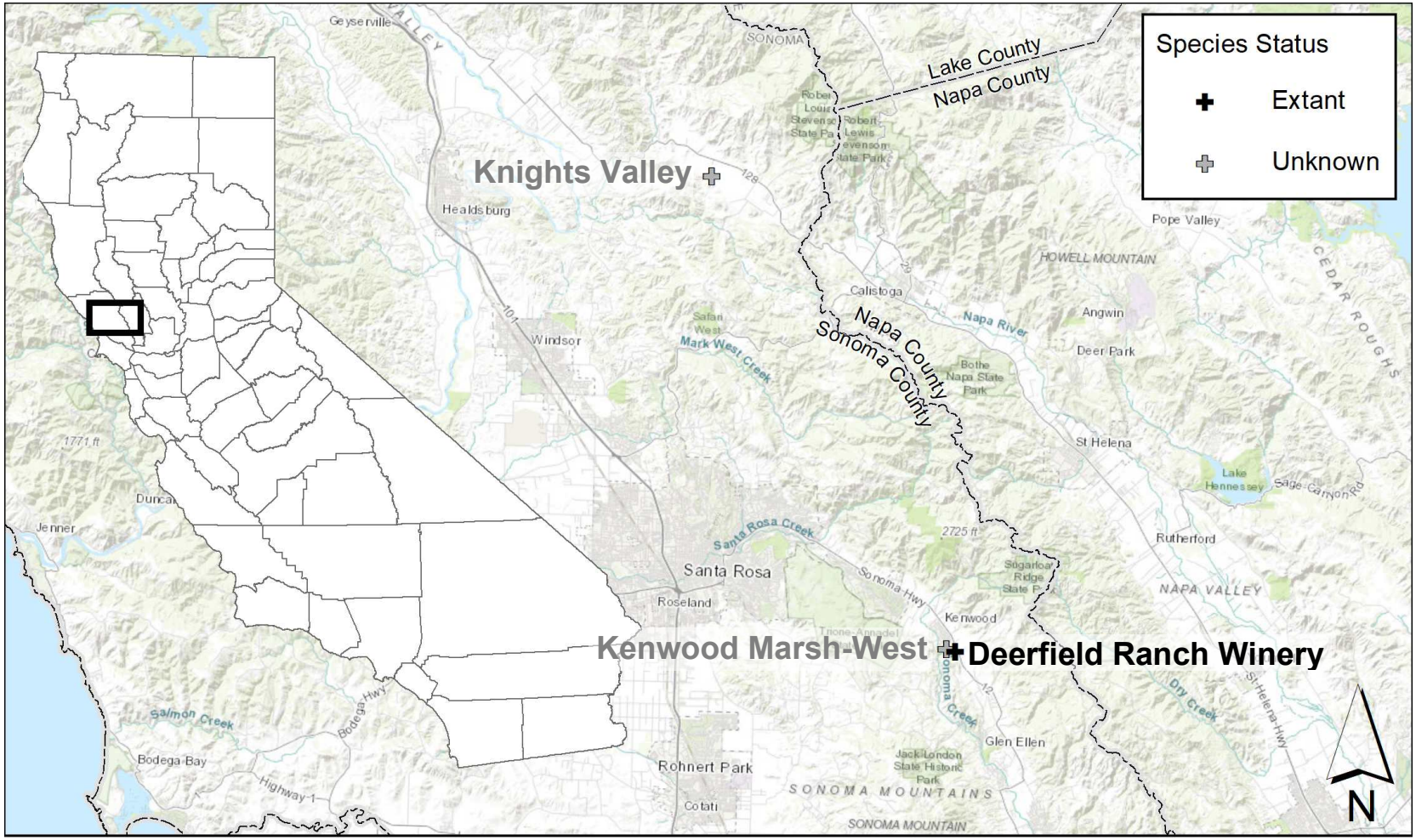
There are currently two occurrences of Kenwood Marsh checkerbloom that are documented in the CNDDB; however, one of these occurrences consists of two separately mapped parts. To make it easier to refer to the different occurrences and their parts in this species review, each occurrence or part of an occurrence has been named as a separate “population” in Table 1 and below. Kenwood Marsh is the element occurrence (EO 1) containing two populations and Knights Valley (EO 2) contains one population, for a total of three populations. The full known distribution of the species is displayed in Figure 3, and the three populations are described in more detail below.

- *Deerfield Ranch Winery* (extant) – this is the southernmost population on record and occurs in Kenwood Marsh on private property in the Kenwood U.S. Geological Survey 7.5-minute topographic quadrangle. There are herbarium collections dating back to 1927, presumably before much of Kenwood Marsh was developed for vineyards and housing. The last voucher specimen was collected in 1998. The population of Kenwood Marsh checkerbloom at this site is fenced and actively managed. In 2009, there were four subpopulations at this site (Table 2). Two of these subpopulations were natural; one was near the road in a clearing (“Road”, Fig. 4) and the other was about 50-80 m (165-265 ft) to the north among small willows (“Willow”). Two additional subpopulations were created in April 2009, one in the willows (“#3”) and one in open sun (“#4”), mimicking the two natural subpopulations (Symonds, pers. comm. 2019). The #4 subpopulation did not last more than a year, and by 2019, the other reintroduced subpopulation, #3, no longer supported any plants. As early as 2015, the natural patch in the willows appeared to be extirpated, so by 2019, the Road subpopulation was all that remained at Deerfield Ranch Winery.

- *Kenwood Marsh-West* (presumed extant) – this site is located about 400 m (0.25 mi) north-northwest of Deerfield Ranch Winery, and also in the Kenwood U.S. Geological Survey 7.5-minute topographic quadrangle. It is on private property and has not been monitored in over 15 years; its current status is unknown, but until the site can be surveyed, it is presumed to be extant.

- *Knights Valley* (presumed extant) – this is the northernmost population on record and occurs northwest of Calistoga, CA on private property in an area known as Knights Valley. The population is mapped within the Mount St. Helena U.S. Geological Survey 7.5-minute topographic quadrangle. There are herbarium collections dating back to 1890, with additional collections in 1979, 1984, and most recently, in 1998. This site was last surveyed in 2001.

Based on satellite images, the wetlands where the three populations are known have not been developed or converted, but without updated plant or hydrological surveys of the areas, it is not possible to determine if changes in hydrology or other threats have led to a change in the plant community, and to the extirpation of Kenwood Marsh checkerbloom in two of the three populations.



Background Image Source: ESRI (Topographic)

0 2.5 5 10 Miles

0 2.5 5 10 Kilometers

FIGURE 3. **Distribution and range map of Kenwood Marsh checkerbloom.** The only confirmed extant population is shown in black and populations of unknown status (presumed extant) are shown in gray.

FIGURE 4. Photos of the Road subpopulation at Deerfield Ranch Winery showing (a) the fenced enclosure protecting the only known extant patch, and (b) a closer view into the enclosure showing Kenwood Marsh checkerbloom in bloom surrounded by sedges (*Carex* spp.)**.** Photos by R. La Rosa.

B. POPULATION TREND AND ABUNDANCE

The periodic monitoring of Kenwood Marsh checkerbloom at Deerfield Ranch Winery and Knights Valley since 1981 shows fluctuating populations, but the way in which population sizes were estimated sometimes differed between years (Appendix C). Because Kenwood Marsh checkerbloom is a long-lived perennial with a large root stock, it can produce many stems each year, which each have branching inflorescences, so flower number per stem can vary greatly. Kenwood Marsh checkerbloom often grows among thick vegetation, making it difficult to determine which stems are growing from a common root base to identify individual plants. Plant surveyors have also been hesitant to get too close to plants for fear of trampling young plants (Symonds, pers. comm. 2019). Consequently, plant censusing across years has not been consistent and has sometimes estimated population size using different "currencies," such as number of genetic individuals, stem number, or number of blooming branch tips. This makes it difficult to compare population estimates across years to identify population trends. In the most recent survey of the single extant subpopulation in 2019, there were 16 flowering individuals, which was fewer than in previous years (Symonds, pers. comm. 2020). Deerfield Ranch Winery is the only site that has been monitored in any of the past 18 years; there is no information on population trends or abundance for the other two populations. Because the condition of the other two populations is unknown, they are presumed extant, but that is unconfirmed.

There is no genetic information from this species to give any indication of its genetic variability and its ability to adapt to changing environmental conditions. It is also unknown how much gene flow occurred between the two populations in Kenwood Marsh (Deerfield Ranch Winery and Kenwood Marsh-West), and whether or not they are one interbreeding population.

V. THREATS AND SURVIVAL FACTORS

A. FACTORS AFFECTING ABILITY TO SURVIVE AND REPRODUCE

At the time of listing in 1982, the threat to Kenwood Marsh checkerbloom was identified as modification and/or destruction of habitat (i.e., conversion of land to vineyards and urbanization). After its listing, the Department identified additional threats to the species in the first five-year species review (CDFG 1987), including cattle grazing and trampling, and competition. For this review in 2020, the Department has identified additional threats, including: human-related activities (e.g., climate change, mowing, and wildfire), predation (i.e., herbivory), competition from invasive species, and random events that pose a threat to species with small populations. Explanations of how these factors threaten Kenwood Marsh checkerbloom's survival are described below.

- *Present or threatened modification or destruction of its habitat* – Conversion of land to agriculture (i.e., viticulture) (CDFG 1981) was an immediate threat to Kenwood Marsh checkerbloom when it was listed in 1982. The area that supported habitat for Kenwood Marsh checkerbloom became increasingly fragmented as it was quickly being converted into vineyards. This conversion of land continues to threaten the survival of Kenwood Marsh checkerbloom, both directly and indirectly. At least two populations are now landlocked and surrounded by vineyards or reservoirs. Lack of adequate habitat adjacent to the current populations diminishes the chances of Kenwood Marsh checkerbloom expanding beyond its current restricted habitat.

In October 2019, the Kincade Fire burned 77,758 acres of Sonoma County, including the entire marsh in Knights Valley where Kenwood Marsh checkerbloom was most recently documented in 2001. It is not known how dry the marsh was leading up to the fire, the intensity of the fire (i.e., how hot it burned), or if Kenwood Marsh checkerbloom root stock or seeds were harmed. It is not known if Kenwood Marsh checkerbloom might benefit from periodic burns to also remove competing vegetation or buildup of dead plant material.

- *Herbivory* – Herbivores can pose a threat to Kenwood Marsh checkerbloom. The most likely herbivores were identified as: deer (*Odocoileus* sp.), slugs (several genera in the Phylum *Mollusca*), snails (*Helix aspersa*), spittle bugs (Family *Cercopidae*), and small rodents such as California voles (*Microtus californica*) (USFWS 2009; Symonds, pers. comm. 2019). These herbivores become a particular threat if a population is fenced, and the vegetation within the exclosure is not properly managed. Dense, overgrown vegetation has the potential to further attract the herbivores listed above.

- *Human-related activities* – In 1987, threats to the hydrology of the regions around the three Kenwood Marsh checkerbloom populations was identified in the Department's five-year species review (CDFG 1987). Because Kenwood Marsh checkerbloom is reliant on fresh water, the modification of regional hydrology through water diversion and wells can have devastating effects on populations. A private reservoir was built adjacent to the Knights Valley population sometime between 1993 and 2004, based on aerial photographs (UCSB 2019). The long-term effects of this reservoir on the adjacent marsh is not known, but it may be diverting water from the marsh.

  The landowner of Deerfield Ranch Winery fenced the Kenwood Marsh checkerbloom population around 2000 to protect it from the threat of mowing or other accidental destruction. There is no longer cattle grazing at Deerfield Ranch Winery (USFWS 2009), but it is unknown if there is currently grazing, or future plans to graze Knights Valley or Kenwood Marsh-West.

  Kenwood Marsh checkerbloom is susceptible to environmental changes associated with climate change (e.g., changes in temperature ranges and increased drought). The Climate Change Vulnerability Index (CCVI) quantifies the vulnerability of a species under current climate change models, using information on the needs of a species, its range, life history, and ecology (NatureServe 2016). Kenwood Marsh checkerbloom is rated as "Extremely Vulnerable" (CDFW 2019), meaning its "abundance and/or range are extremely likely to substantially decrease or disappear by 2050" (NatureServe 2016). The factors that greatly increase the vulnerability of Kenwood Marsh checkerbloom are: natural and anthropomorphic barriers (e.g., hills, dry upland habitat, and vineyards) that restrict the species' ability to shift its range in response to climate change; low dispersal, which limits the distance the species can move per generation; and a narrow physiological hydrological niche, because the species is restricted to wetlands and highly sensitive to drought (CDFW 2019). Other factors that increase its vulnerability are: low historical mean temperature variation (i.e., annual temperature range) of 9.4°C (49°F), which suggests Kenwood Marsh checkerbloom may not be well adapted to changes in climate; an historical hydrological niche, of very little variation in rainfall across the range (mean = 94 cm (37 in), st. dev. = 6.7 cm (2.6 in)); competition from other plant species; and reliance on pollinators for sexual reproduction.

- *Other natural occurrences* – With such small population sizes, confined to very small areas, Kenwood Marsh checkerbloom is highly vulnerable to random events. In 2012 rodents were likely responsible for the destruction of many reproductive stalks, reducing the population's ability to produce seed. Documented random events that have or may have negatively affected the natural population include rodent outbreaks, extended periods of inundation, and wildfire. Small populations are also susceptible to inbreeding depression, which results in low genetic variation and the potential inability to adapt to environmental changes (Ellstrand and Elam 1993). The ability to adapt is crucial in the face of climate change.

- *Competition* – Kenwood Marsh checkerbloom competes with dense surrounding vegetation for resources such as sunlight, soil moisture, and soil nutrients. Depending on the site, Kenwood Marsh checkerbloom competes with invasive species like velvetgrass (*Holcus lanatus*), Himalayan blackberry (*Rubus armeniacus*), and pennyroyal (*Mentha pulegium*). Kenwood Marsh also supports dense patches of sedges (*Carex* spp.) and common tule (*Schoenoplectus acutus* var. *occidentalis*), which were listed as a threat to the species in 1987.

B. Degree and Immediacy of Threats

Threats faced by Kenwood Marsh checkerbloom have increased since this species was placed on the list of endangered species in 1982. This species remains in extreme danger of extinction. Without continued protection of the natural populations, and management through recovery projects, Kenwood Marsh checkerbloom could become extinct at any time. Competition from dense surrounding vegetation, changes in hydrology from viticulture and climate change, loss of genetic diversity due to population reductions, and random events are likely the greatest threats to Kenwood Marsh checkerbloom. Timing and outcome of some of these types of threats are, by nature, unpredictable and require diligent monitoring and management actions to reduce the risk of extinction.

VI. MANAGEMENT AND RECOVERY

A. Impact of Existing Management Efforts

Management efforts have been undertaken only at Deerfield Ranch Winery. This management consisted of fencing subpopulations, collecting and storing seeds for long-term conservation, reducing dead plant material, and reintroducing cultivated plants to create new subpopulations. Funding to continue these activities has not been secured, and any management efforts are being conducted on a voluntary basis.

Current and past management efforts are described in more detail below.

i. Erecting Fence Exclosures

In 2000, the private landowner at Deerfield Ranch Winery fenced the two small subpopulations of Kenwood Marsh checkerbloom that were growing on the property (USFWS 2009). Fenced exclosures protect the species from human activities (e.g., mowing) and from grazing by large wildlife and livestock; however, fencing subpopulations also requires continued management to prevent a buildup of thatch and overgrown vegetation (see *ii.* below).

ii. REMOVAL OF THATCH

After the Road subpopulation at Deerfield Ranch Winery was fenced, thatch buildup became an issue because plant material could not be removed by other means (e.g., grazing or mowing). It built up over time, making it difficult for seedlings to become established. Current management is provided by the landowner and a team of volunteers, which visit the population annually to carefully remove dead plant material from around the Kenwood Marsh checkerbloom individuals. The thick layer of thatch is removed completely from the fenced exclosure. Anecdotally, removing thatch increases the number of seedlings (Symonds, pers. comm. 2020), benefitting the subpopulation. The subpopulation is too small to have control plots where thatch is left intact for an experimental comparison. The thatch removal occurs in the spring when plants are beginning to (re)sprout.

iii. CONSERVATION SEED STORAGE

In 2001, 2007, 2008, 2009 and 2018, about five percent or less of total seeds were collected by the Department, USFWS, or K. Symonds (CESA permit 2081(a)-09-04-RP) for the preservation of Kenwood Marsh checkerbloom (USFWS 2009; RSABG 2019; Symonds, pers. comm. 2019). Seeds were collected from Deerfield Ranch Winery and Knights Valley in 2001 and from only Deerfield Ranch Winery in subsequent years. The seeds are stored at Rancho Santa Ana Botanic Garden (RSABG) and the University of California Botanical Garden (UCBG) for long-term conservation. Some seeds from the 2007 collection were used for reintroduction efforts (see *iv* below) and were germinated by UCBG for reintroduction activities (USFWS 2009; Symonds, pers. comm. 2019). Seeds may also be stored by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), but the NRCS could not confirmation this.

iv. REINTRODUCTION OF PLANTS AT KENWOOD MARSH (2004-PRESENT)

Beginning in 2004, efforts to protect the population of Kenwood Marsh checkerbloom growing in Kenwood Marsh were undertaken through a collaboration between the private landowner, the USFWS, NRCS, and the Department. A Wildlife Extension Agreement between the landowner and USFWS was signed in 2007 with a cost-sharing agreement and conservation plan in place. ~~As part of the agreement, a permanent conservation easement was recorded in April 2007.~~ Prior to this agreement, the landowner had fenced the two subpopulations that occurred on the property.

Two reintroduced subpopulations were outplanted through a Wildlife Extension Agreement. A grant from the Partnership Program in 2007 allowed for plants to be grown at UCBG and outplanted into two new sites at Deerfield Ranch Winery in April 2009 with permission from the private landowner. The two natural sites differed in soil moisture, associated plants, and light levels (USFWS, in litt. 2008a); the two new small outplanting sites were chosen to mimic one of each of the natural sites (Table 2). The new subpopulations were fenced, and 13 mature individuals were planted into the wetter, shaded, #3 site, and nine were planted into the drier, full sun, #4 site.

These sites were monitored for ten years. The drier, full sun subpopulation (#4) failed to establish after just one year, likely due to the very wet winter in 2009-2010 (Symonds, pers. comm. 2020). The wetter, low light subpopulation (#3) had very large plants with large leaves for many years, but declined to zero by 2019. Symonds (pers. comm. 2020) hypothesized this was because the surrounding willows grew much larger and the site became too shady to support the subpopulation. In 2019, only the Road subpopulation supported Kenwood Marsh checkerbloom. The Wildlife Extension Agreement expired in

2017, but the landowner has continued conservation efforts on the property with help from local volunteers and non-profit organizations.

B. Recommendations for Management Activities and Other Recommendations for Recovery of the Species

The Department's recommendations for management and recovery of Kenwood Marsh checkerbloom begin with the continued preservation of the current natural populations through monitoring activities and promotion of recruitment of plants into the population. Recovery of Kenwood Marsh checkerbloom is dependent on reintroductions into the historical range of the species to boost the number of individuals and occurrences. Recommendations include:

- Continue outreach efforts to the private landowners in the historical range of Kenwood Marsh checkerbloom for permission to survey the remaining populations and to discuss employing tools such as Safe Harbor Agreements (Fish and G. Code § 2089.2 et seq.) to incentivize recovery and conservation of the species.
- Coordinate with other resource agencies and organizations to establish a formal recovery team to support the recovery efforts that began with a 10-year Wildlife Extension Agreement through the USFWS in 2007 (USFWS 2009). The USFWS is in the process of developing a recovery plan for the species (Bainbridge, pers. comm. 2019b).
- Continue collecting seeds following protocols that consider genetic diversity and rarity (e.g., RSABG 2009) and place them in long-term conservation storage at Department-approved facilities.
- Conduct research into developing habitat management techniques that improve the longevity and reproductive success of existing mature plants, and provide habitat for the successful establishment of seedlings.
- Conduct a genetic analysis of the natural population in Kenwood Marsh, and others if possible, to quantify current genetic diversity, providing the most scientifically-grounded information for making decisions about management actions. It is critical to preserve genetic diversity of the species to increase its chances of adapting to environmental changes (i.e., climate change). Care should be taken when collecting tissue for such genetic studies, seeking techniques that minimize impacts to the natural population. Additionally, understanding the genetics of the cultivated stock will facilitate recovery efforts to promote genetic diversity in any new introduced populations.
- Consider expanding the natural population by planting seedlings that have been cultivated from wild-collected seeds. However, all proposals should strongly weigh the risk of unintended introductions of pathogens or other factors that may negatively affect the current highly vulnerable population.
- Promote educational outreach to the communities in the range of Kenwood Marsh checkerbloom to promote botanical surveys. Model habitat criteria to identify possible suitable habitat in the vicinity of Kenwood Marsh and Knights Valley, then survey to locate new occurrences that may have gone undetected. Additionally, post-fire surveys of areas that were previously surveyed will be important to understand the effects of wildfire on Kenwood Marsh checkerbloom.

VII. RECOMMENDATION TO THE COMMISSION

Pursuant to Fish and Game Code, section 2077, the Department has prepared this Five-Year Species Review based upon the best scientific information available to the Department to determine if conditions that led to the original listing are still present. Based on this Five-Year Species Review, the Department submits the following recommendation to the Commission:

In completing this Five-Year Species Review for Kenwood Marsh checkerbloom, the Department finds there is sufficient scientific information to indicate that the conditions that led to the listing of Kenwood Marsh checkerbloom as endangered are still present, and recommends no change to the status of Kenwood Marsh checkerbloom on the list of endangered species at this time.

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USFWS (U. S. FISH AND WILDLIFE SERVICE). 2008c. Notes by E. Warne from a telephone conversation from E. Parsons. Subject: Kenwood Marsh checkerbloom counts. 30 December 2008.

WILCOX, N. 1994. Letter to D. Steeck, California Department of Fish and Game, and accompanying chemical analyses of wells within Kenwood Marsh.

C. PERSONAL COMMUNICATION

BAINBRIDGE, E. 2019a. E-mail message to R. La Rosa regarding the USFWS 5-year review. [20 February 2019].

BAINBRIDGE, E. 2019b. E-mail message to R. La Rosa regarding USFWS Recovery Plan for Kenwood Marsh checkermallow. [16 July 2019].

PARSONS, E. 2019. Discussion with R. La Rosa regarding a potted specimen of Kenwood Marsh checkerbloom. [13 July 2019].

SYMONDS, K. 2019. Conversation with R. La Rosa during a site visit to Kenwood Marsh. [13 July 2019].

SYMONDS, K. 2020. Conversation with R. La Rosa regarding reintroductions at Kenwood Marsh. [22 January 2020].

IX. LIST OF FIGURES

X. LIST OF TABLES

XI. LIST OF APPENDICES

APPENDIX A. Quaternary geologic deposits associated with Kenwood Marsh checkerbloom occurrences. Sites include Deerfield Ranch Winery (DRW), Kenwood Marsh-West (KMW) and Knights Valley (KV). Descriptions are taken from the California Geological Survey (CDOC 2010).

Geological Series	Population	Description
QPc	DRW, KMW	Pleistocene and/or Pliocene sandstone, shale, and gravels deposits; mostly loosely consolidated
Qoa	KMW	Older alluvium, lake, playa, and terrace deposits
Q	KV	Alluvium, lake, playa, and terrace deposits; unconsolidated and semi-consolidated

APPENDIX B. Soil composition of naturally occurring Kenwood Marsh checkerbloom sites. Sites include Deerfield Ranch Winery (DRW), Kenwood Marsh-West (KMW), and Knights Valley (KV). The soils series share a similar profile: fine-loamy texture, mixed topsoil, and superactive cation activity (Soil Survey Staff 2001, 2003, 2019).

Soil Series	Site	Texture	Topsoil	Cation activity	Soil group
Huichica	DRW, KMW	fine-loamy	mixed	superactive	thermic Abruptic Haplic Durixeralfs
Los Robles	KV	fine-loamy	mixed	superactive	thermic Typic Haploxerepts

APPENDIX C. Population and subpopulation census of Kenwood Marsh checkerbloom. Survey method likely differed between years, so counts may represent individuals, flowering stalks, or flower clusters. Populations include Deerfield Ranch Winery (DRW), Kenwood Marsh-West (KMW), and Knights Valley (KV). *flowering stalks only; ** reproductive individuals only.

Population	DRW	DRW	DRW	DRW	DRW	KMW	KV	Collector	Source
Subpop.	Road	Willow	#3	#4					Table 2
EO	1	1	1	1	1	1	2		CNDDB 2019
1979							<100	Unknown	USFWS 2009
1981							500	Unknown	CDFG 1981
1986					85		38	B & J Guggolz	CNDDB 2019
1987					136			B & J Guggolz	CNDDB 2019
1988					150	400		E. Parsons	USFWS, in litt. 2008c
1989					100	125		E. Parsons	USFWS, in litt. 2008c
1990					200	150		E. Parsons	USFWS, in litt. 2008c
1991					92	80		E. Parsons	USFWS, in litt. 2008c
1993							70	B & J Guggolz	CNDDB 2019
1993					600	500		N. Wilcox	USFWS, in litt. 2008c
1998					40+		47	B & J Guggolz	CNDDB 2019
2001					232*		25	G. Cooley	Cooley, in litt. 2001
2007					33			K. Symonds	USFWS 2019
2008	11	13			24			K. Symonds	USFWS, in litt. 2008b
2009			13**	9**				K. Symonds	Symonds, pers. comm. 2019
2010	126*		13**	0				K. Symonds	USFWS 2019
2012	42*	20*	39*	0	103*			K. Symonds	USFWS 2012
2013	162*	9*	14*	0	185*			K. Symonds	USFWS 2013
2016	256*							K. Symonds	Symonds, pers. comm. 2020
2019	16**	0	0	0	16**			K. Symonds	Symonds, pers. comm. 2019

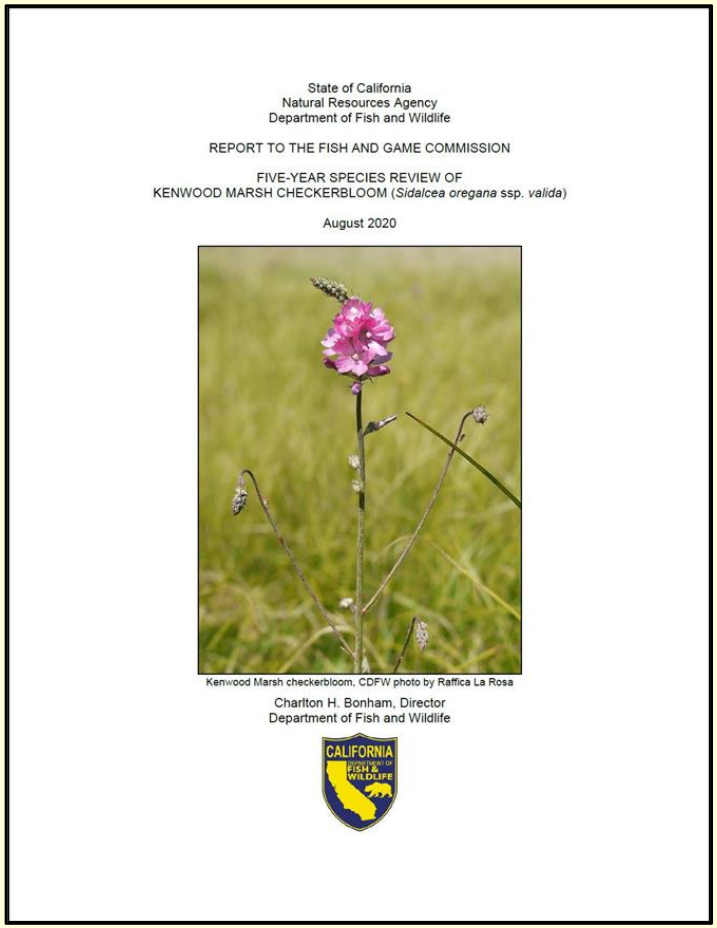
5-Year Species Review:

Kenwood Marsh checkerbloom
(Sidalcea oregana ssp. *valida)*

Fish & Game Commission Meeting

October 15, 2020

Raffica La Rosa, PhD
Native Plant Program
raffica.larosa@wildlife.ca.gov
(916) 376-8670



State of California
Natural Resources Agency
Department of Fish and Wildlife

REPORT TO THE FISH AND GAME COMMISSION

FIVE-YEAR SPECIES REVIEW OF
KENWOOD MARSH CHECKERBLOOM (*Sidalcea oregana* ssp. *valida*)

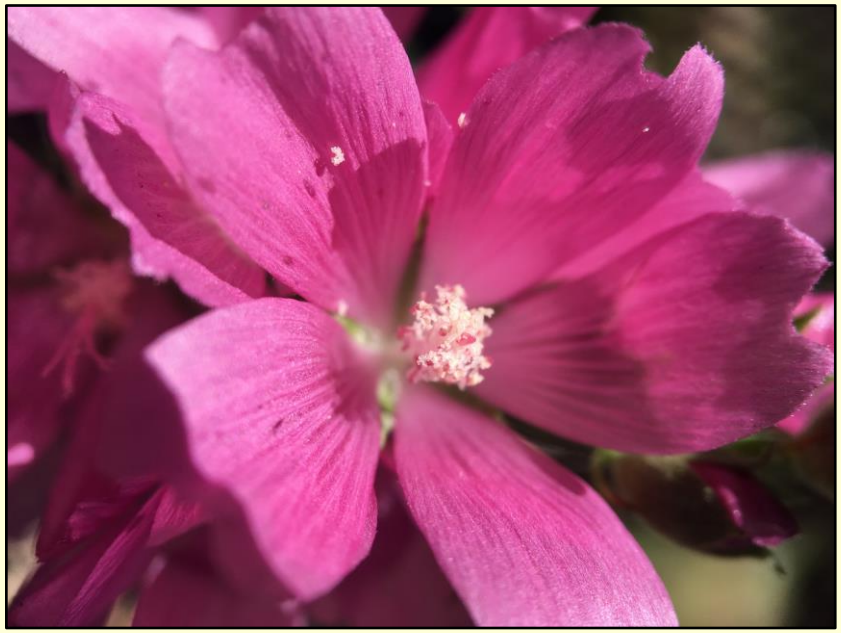
August 2020

Kenwood Marsh checkerbloom, CDFW photo by Raffica La Rosa

Charlton H. Bonham, Director
Department of Fish and Wildlife

Kenwood Marsh checkerbloom
(Sidalcea oregana ssp. *valida)*

Raffica La Rosa



Josh Hull

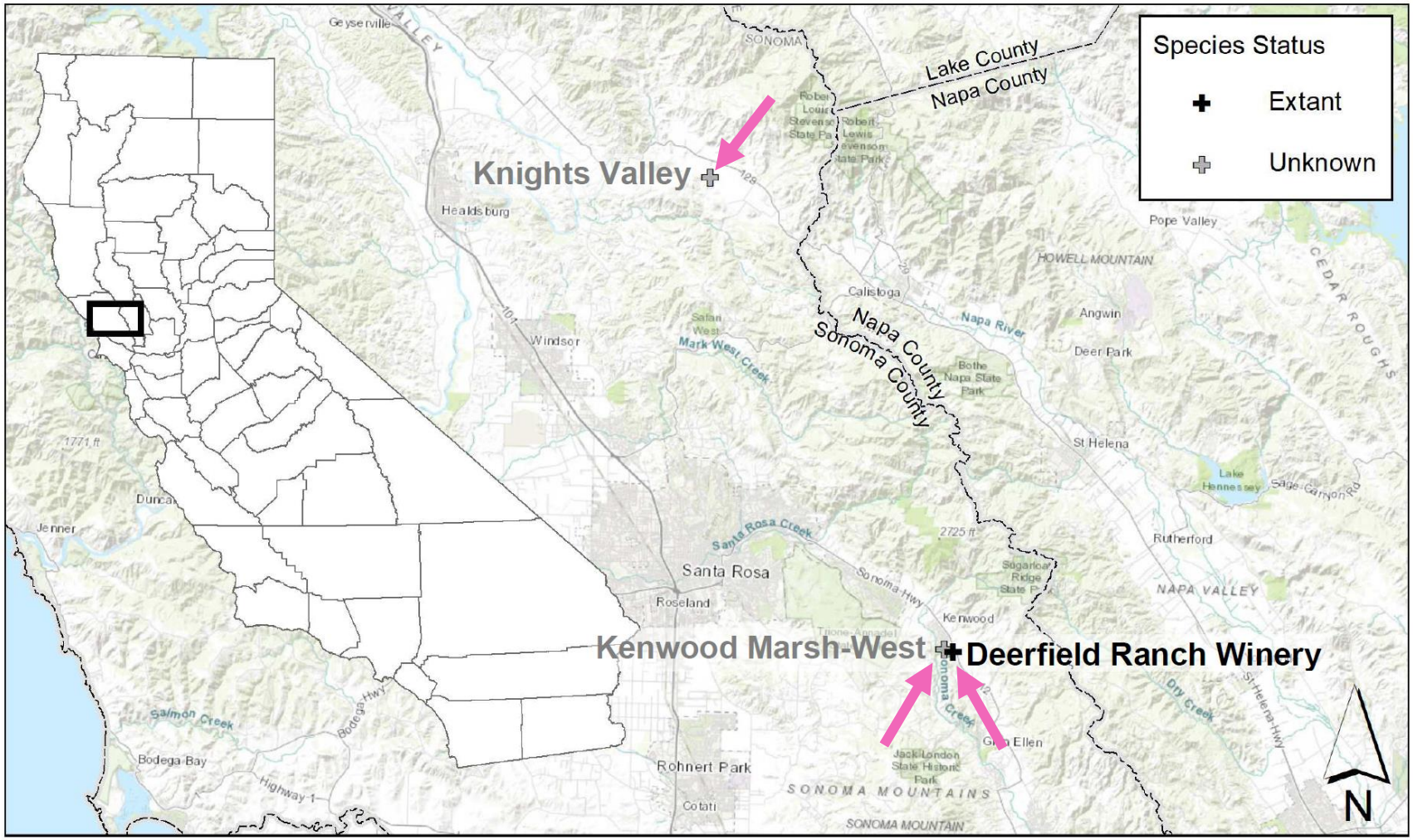
- Perennial
- Malvaceae (mallow family)
- Flowers June - September

Listing

- Listed as endangered under CESA in 1984
- Three documented populations
- Only in Sonoma Co.

Raffica La Rosa

Distribution



Background Image Source: ESRI (Topographic)

0 2.5 5 10 Miles

0 2.5 5 10 Kilometers

Population Status

Knights Valley

Kenwood Marsh

Threats to Survival

- **Modification or destruction of habitat**
  - Conversion to vineyards and pasture
  - Urbanization
  - Changes to hydrology*
  - Mowing*
  - Wildfire*
- Competition
- Climate change*
- Random events*
- Herbivory*

* Added in 2020

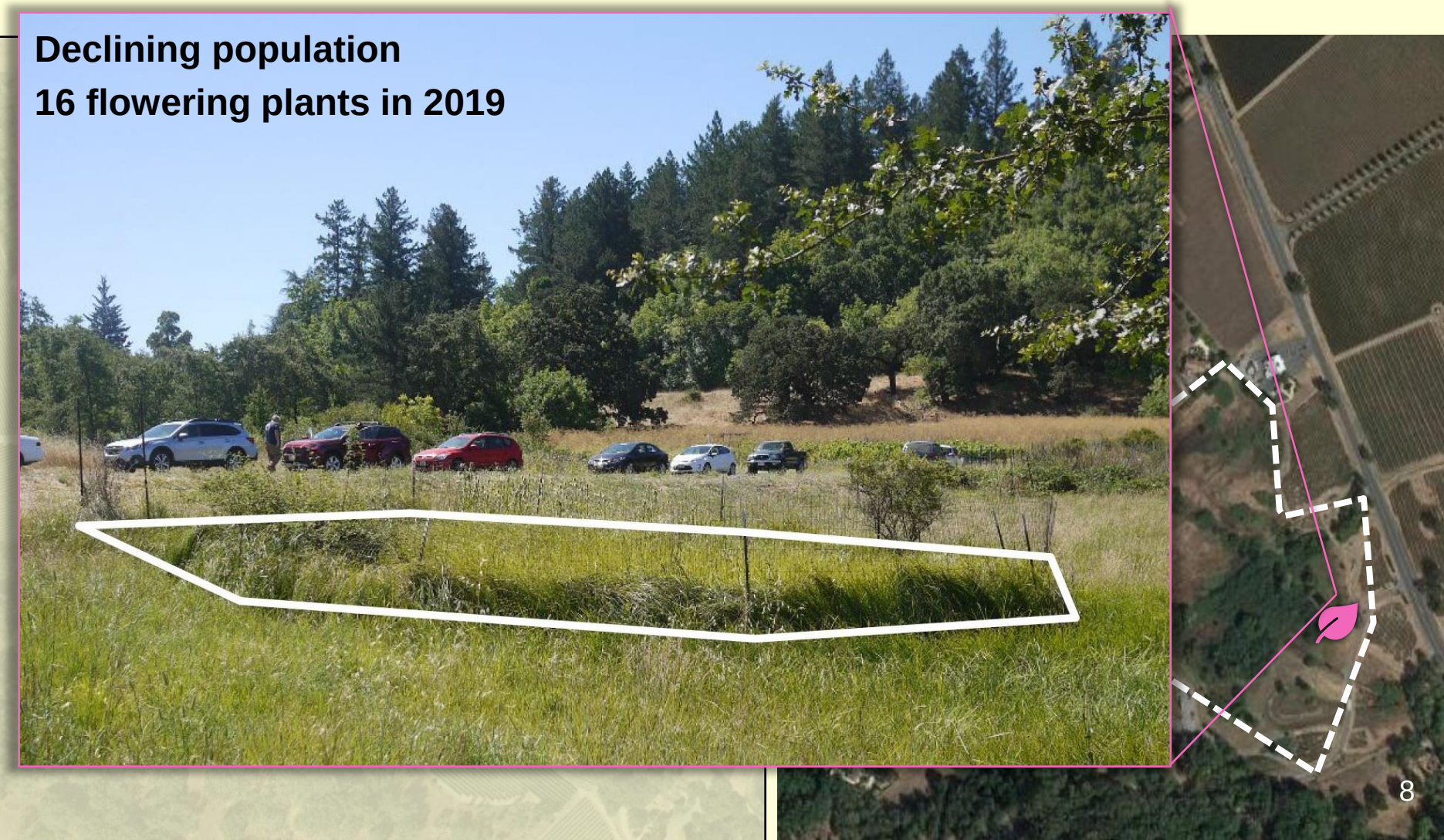
Modification/Destruction of Habitat

Knights Valley

Kenwood Marsh

Other Threats and Low Abundance

Kenwood Marsh



Management & Recovery

- Funding needed
- Two introductions (2009) failed to establish
- Proposed research and restoration to expand distribution
- Recovery plan by the U.S. Fish & Wildlife Service

Kate Symonds

Summary

- Only <u>one</u> confirmed population remains
- 16 reproductive plants in 2019
- Continues to be on the brink of extinction
- Many threats to its survival

Raffica La Rosa

Retain current status: Endangered

Questions ◈ Thank You

Kate Symonds

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Native Plant Program
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(916) 376-8670

March 23, 2020

Eric Sklar, President
Melissa Miller-Henson, Executive Director
California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090
Via Email to: fgc@fgc.ca.gov

Re: Petition to revise listing status of Agassiz's desert tortoise from threatened to endangered

Dear President Sklar and Executive Director Miller-Henson:

On behalf of Defenders of Wildlife, the Desert Tortoise Council and Desert Tortoise Preserve Committee (Petitioners), I submit the attached petition to revise the listing of Agassiz's desert tortoise or desert tortoise (*Gopherus agassizii*) from threatened to endangered under provisions of the California Endangered Species Act (Fish and Game Code Sections 2050, et seq.) and Section 670.1, Title 14, California Code of Regulations (CCR).

Defenders of Wildlife is a national wildlife conservation organization founded in 1947 and is dedicated to protecting all wild animals and plants in their natural communities. To this end, we employ science, public education and participation, media, legislative advocacy, litigation, and proactive on-the-ground solutions to impede the accelerating rate of extinction of species, associated loss of biological diversity, and habitat alteration and destruction. Defenders of Wildlife has 1.8 million members and supporters in the U.S. including 279,000 in California.

The Desert Tortoise Council is a non-profit organization comprised of hundreds of professionals and laypersons who share a common concern for wild desert tortoises and a commitment to advancing the public's understanding of desert tortoise species. Established in 1975 to promote conservation of tortoises in the deserts of the southwestern United States and Mexico, the Council routinely provides information and other forms of assistance to individuals,

organizations, and regulatory agencies on matters potentially affecting desert tortoises within their geographic ranges.

The Desert Tortoise Preserve Committee is a non-profit organization formed in 1974 to promote the welfare of the desert tortoise in its native wild state. Committee members share a deep concern for the continued preservation of the tortoise and its habitat in the southwestern deserts. The Desert Tortoise Preserve Committee is dedicated to the recovery and conservation of the Desert Tortoise and other rare and endangered species inhabiting the Mojave and western Sonoran deserts.

The Fish and Game Commission listed the desert tortoise nearly 31 years ago as a threatened species on June 23, 1989. It was listed as a threatened species by the U.S. Fish and Wildlife Service in 1990 and followed by designation of its critical habitat in 1994.

Despite measures taken by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service and federal land management agencies, the desert tortoise continues to decline due to human related activities that include habitat loss and fragmentation, widespread invasion by non-native plants, mortality caused by motorized vehicles and infectious diseases. The species is in much worse condition now than when it was listed as a threatened species three decades ago and is now below what the U.S. Fish and Wildlife Service considers minimum viable density in 9 out of 10 critical habitat units in California.

Our petition provides ample evidence that the desert tortoise warrants listing as endangered throughout California. It is our hope that the Fish and Game Commission and its staff, as well as the Department of Fish and Wildlife find our petition a compelling rationale that leads to uplisting of this critically imperiled species to endangered.

Sincerely,

Pamela Flick
California Director
Defenders of Wildlife
980 Ninth Street, Suite 1730
Sacramento, California 95814
pflick@defenders.org

Attachment: Petition

FGC - 670.1 (3/94)

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: **Agassiz's desert tortoise or Mojave desert tortoise**

Scientific Name: **(*Gopherus agassizii*)**

II. RECOMMENDED ACTION:

(Check appropriate categories)

a. List ☐ b. Change Status ☒

As Endangered ☐ from **Threatened**

As Threatened ☐ **to Endangered**

Or Delist ☐

III. AUTHORS OF PETITION:

Names: Jeff Aardahl and Tom Egan for Defenders of Wildlife
Ed LaRue for Desert Tortoise Council
Ron Berger for Desert Tortoise Preserve Committee

Address: Jeff Aardahl, California Representative
Defenders of Wildlife
46600 Old State Highway, Unit 13
Gualala, CA 95445
(707) 884-1169

I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Signature: Jeff Aardahl Date: 3/11/2020

Address: Tom Egan, California Desert Representative
Defenders of Wildlife
P.O. Box 388
Helendale, CA 92342
(760) 221-7531

I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Signature: Date: 3/11/2020

I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Address: Ed LaRue, Chairperson Ecosystems Advisory Committee
Desert Tortoise Council
4654 East Avenue S. #257B
Palmdale, CA 93552

Signature: Date: 3/11/2020

Address: Ron Berger, President
Desert Tortoise Preserve Committee
4067 Mission Inn Avenue
Riverside, CA 92501

I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Signature: Date: 3/11/2020

PETITION TO THE STATE OF CALIFORNIA FISH AND GAME COMMISSION SUPPORTING INFORMATION FOR

Agassiz's desert tortoise or Mojave desert tortoise (*Gopherus agassizii*)
Common Name **Scientific Name**

EXECUTIVE SUMMARY

Based upon a scientific review of its distribution and status, this petition requests that the Agassiz's desert tortoise (*Gopherus agassizii*; Mojave desert tortoise or desert tortoise) be moved from listed as Threatened to Endangered by the California Fish and Game Commission (Commission). Despite federal and state protections, the desert tortoise is closer to extinction than it was in 1989 and 1990 when it was listed by the Commission and U.S. Fish and Wildlife Service (USFWS), respectively. A change in listing from Threatened to Endangered will reflect the current dire situation facing California's state reptile and is necessary to generate substantially increased attention and efforts to reverse the very real likelihood that desert tortoise will become extinct in California.

The Commission listed the desert tortoise as Threatened under the California Endangered Species Act (CESA) in 1989. The Mojave population of the desert tortoise was listed as Endangered under a federal emergency listing rule under the Endangered Species Act (ESA) by the USFWS that same year. In 1990, the Mojave population of the species was listed by the USFWS under a final ESA rule as Threatened (USFWS 1990). A recovery plan prepared by the USFWS for this federally-listed species was adopted in 1994 (USFWS 1994a), with Critical Habitat concurrently designated (USFWS 1994b). A revised recovery plan for the species, noting problems in implementing certain previous recovery plan actions, was adopted in 2011 (USFWS 2011).

The initial California listing of the desert tortoise as threatened was based on a severe decline of tortoises throughout California, Nevada, Utah, and northwest Arizona – with California populations considered the most endangered.

Recent genetic analysis has concluded that the Mojave population of the desert tortoise is a distinct species, not a population, with a range that includes southeastern California, southern Nevada, northwest Arizona, and southwest Utah (Murphy et al. 2011). Those tortoises occurring in the rest of Arizona and northwest/west Sonora, Mexico, have recently been described as a separate species, Morafka's desert tortoise (*Gopherus morafkai*), and those in southwest Sonora and Sinaloa, Mexico, as Goode's thornscrub tortoise (*Gopherus evgoodei*) (Edwards et al. 2016). The species occurring in California is best described as Agassiz's desert tortoise (*Gopherus agassizii*).

Thirty-years after its listing as Threatened under provisions of the CESA and ESA, Agassiz's desert tortoise is in worse condition with the species on a path to

extinction due to an increase in the number and severity of threats. Similarly, while Critical Habitat was designated for this species in 1994 and several federal resource management plans have been adopted by the Bureau of Land Management (BLM) and designed to improve habitat conditions, the sobering reality is that conditions on the ground have worsened for Agassiz's desert tortoise habitat over the long term, especially in California. More development and increased human uses have occurred in the California desert since listing, resulting in substantial loss of individuals, reduced recruitment, and substantial loss/degradation of habitat. Further, these threats are amplified by the effects of climate change on tortoise habitat. As a result, tortoise populations throughout **all** Recovery Units in California continue to decline.

Reversing the trend towards extinction and putting Agassiz's desert tortoise on a path towards recovery is difficult because the tortoise is a long-lived reptile, requiring up to 20 years to reach sexual maturity, and has a low reproductive rate over a long period of reproductive potential. The combination of a late breeding age and a low reproductive rate makes accomplishing desert tortoise recovery very challenging (USFWS 1994a). In addition, the continued, ongoing loss and degradation of the species' last remaining occupied habitat from a variety of authorized and unauthorized land uses, in an area of increasing human population growth, renewable energy development and generation, motorized vehicle recreation, and other human impacts, only makes the conservation and recovery of the desert tortoise even more challenging.

Threats to the species at the time of the 1990 federal listing as Threatened have not abated. Instead, they are more widespread and intense. The relatively recent expansion of military testing and training installations (United States Army National Training Center, Fort Irwin; United States Navy, Marine Corps Air Ground Combat Center, Twentynine Palms); development of large-scale renewable energy projects throughout the range of Agassiz's desert tortoise; and increased human population growth and activities in the California desert have resulted in concurrent tortoise mortality and habitat degradation/loss, both adjacent to human communities and at appreciable distances. Notably, tortoise populations located immediately adjacent to expanding human communities have disappeared.

Tortoises and their habitats are impacted by a myriad of authorized and illegal human activities that degrade or eliminate suitable creosote bush scrub and other vegetation communities needed as habitat. In particular, off-highway vehicle use, especially widespread, unregulated use on lands that are supposed to be protected, destroys and fragments habitat, injures and kills tortoise, and crushes tortoise burrows and eggs. Human activities also subsidize predators whose increased numbers prey on tortoises and facilitate invasion of non-native species of plants that degrade habitat quality and displace native forbs and grasses needed for adequate nutrition and reproduction/recruitment (Brooks and Berry 2006). Invasive, non-native plants also increase flammable fuel load to the point where wildfire, when it occurs, results in catastrophic megafires that kill tortoises

outright. Recovery from fire in Mojave and Colorado desert vegetation communities is extremely slow because these communities are not adapted to wildfire and non-native plants outcompete native species during the post-fire period (Brooks and Esque 2002).

Climate modeling predicts that California's deserts will experience longer and more frequent drought and increased temperatures. These climate conditions will impact tortoise habitat and food supply, the species' ability to reproduce and recruit tortoises, and its sensitivity as a cold-blooded reptile to increasing temperature extremes. These impacts combined with the ongoing impacts from human activities are endangering Agassiz's desert tortoise throughout California.

The USFWS has repeatedly identified high adult tortoise survivorship as a key factor in meeting tortoise recovery objectives (USFWS 1994a, 2011). However, science-based surveys (line distance sampling) extending over a 10-year period throughout the species' range in California and data from permanent study plots indicate this key factor is not being achieved (USFWS 2015). These surveys demonstrate that desert tortoise numbers are declining significantly and resulting in all three Recovery Units experiencing reduced numbers and densities that reflect a species on a trajectory toward extinction.

Based on systematic USFWS-designed line distance sampling conducted by the USFWS's Desert Tortoise Recovery Office (DTRO), from 2004 through 2014, adult tortoises in the three California Recovery Units (Western Mojave, Colorado Desert, Eastern Mojave) declined 51.3 percent from 119,029 individuals to 65,726 (USFWS 2015). It is noteworthy and troubling for the future survival and recovery of desert tortoise that these losses occurred within federally designated Critical Habitat Units for tortoises, which, in theory, receive a higher level of protection under provisions of the federal ESA and land use plans prepared by federal agencies, primarily by the BLM for public lands in the California Desert Conservation Area.

Adult tortoise densities in Critical Habitat within the Western Mojave Recovery Unit averaged 5.7 per square kilometer in 2004, in contrast with an average density of 2.8 per square kilometer in 2014. This serious reduction is consistent with the substantial decreases in tortoise population densities documented within all three Recovery Units in California (Allison and McLuckie 2018). Unfortunately, this current decline is a continuation of the downward population trends documented in the Western Mojave by BLM wildlife biologists using a series of one square-mile study plots beginning in 1979 and extending to 2002. Initial surveys on these plots documented adult desert tortoise densities ranging from 29 to 147 per square kilometer in much of the western Mojave Desert (Tracy et al. 2004). Using the available scientific survey data, **adult tortoise densities in the Western Mojave Recovery Unit declined by 85 to 95 percent between 1980 and 2014** and continue to decline to the present time.

According to Allison and McLuckie (2018), adult tortoise densities in the three California Recovery Units of Agassiz's desert tortoise declined at the following annual rates during the period 2004 through 2014: Colorado Desert –4.5%; Eastern Mojave –11.2%; and Western Mojave –7.1%.

Allison and McLuckie (2018) also concluded that:

- *Overall this threatened species is* ***experiencing large, ongoing population declines****, and* ***adult tortoise numbers have decreased by over 50% in some recovery units*** *since 2004*;

- ***Declining adult densities through 2014 have left the Western Mojave adult numbers at 49% and in the Eastern Mojave at 33% of their 2004 levels****. Such steep declines in the density of adults are only sustainable if there were suitably large improvements in reproduction and juvenile growth and survival. However, the proportion of juveniles has not increased anywhere since 2007, and in these two recovery units* ***the proportion of juveniles in 2014 has declined to 91% and 77% of their representation in 2004,*** *respectively*;

- *Recent attention has focused especially on increased predation risk in the Western Mojave, Eastern Mojave, and Colorado Desert recovery units due to prey-switching during droughts by* Coyotes *(Canis latrans) and especially by increasing abundance of* Common Ravens *(Corvus corax), which typically prey on smaller tortoises rather than on adults*;

- *The negative population trends in most of the* [Tortoise Conservation Areas] *TCAs for Mojave Desert Tortoises indicate that* ***this species is on the path to extinction under current conditions.*** *This may reflect inadequate recovery action implementation, slow response by tortoises and their habitat to implemented actions, or new and ongoing human activities in the desert that have not been mitigated appropriately. It may also be a result of stochastic or directional climatic events that impact large expanses of tortoise habitat (e.g., drought, fire, climate change) and are largely beyond the realm of local land management activities.* ***Our results are a call to action to remove ongoing threats to tortoises from TCAs, and possibly to contemplate the role of human activities outside TCAs and their impact on tortoise populations inside them.***

(Emphasis added).

The USFWS (1994a) has determined that the minimum viable density of adult tortoises is 3.9 tortoises per square kilometer (10 tortoises per square mile), and that populations with densities below this size are in danger of extinction. The USFWS (2015) has reported that the density of adult desert tortoises in the three

Desert Tortoise Recovery Units in California are less than the minimum viable density and are experiencing a declining trend.

In addition to the startling population declines, this species is also facing significant uncertainty regarding protections on federal land. The California Desert Conservation Area (CDCA) Plan is the primary document guiding management on BLM land and was amended by the Desert Renewable Energy Conservation Plan (DRECP) in 2016 and the West Mojave Plan Route Network and Livestock Grazing Project in 2019. The most recent West Mojave Plan provides for a continuation of excessive vehicle use and livestock grazing, which are two of the most important threats to the desert tortoise and its critical habitat. Further, there is a currently pending plan amendment to the DRECP that is anticipated to contain further reductions in protections to desert tortoise.

Based on the best available scientific information presented in this petition, naturally-occurring populations of Agassiz's desert tortoise are on the verge of extirpation in California from a variety of human-caused threats and warrant a change in their listing status from Threatened to Endangered. Defenders of Wildlife, Desert Tortoise Council and Desert Tortoise Preserve Committee (Petitioners) believe changing the status of the species from Threatened to Endangered under provisions of the California Endangered Species Act will result in improved conservation and management outcomes for this species because it will (1) accurately reflect its status under CESA, (2) better inform project proponents that the tortoise is in danger of extinction and they should move their projects out of tortoise habitat/linkage areas to avoid extinction in California, (3) result in fully mitigation/compensation for the direct, indirect, and cumulative impacts to the tortoise, (4) provide for the implementation of more recovery actions to prevent its extinction in California, and (5) result in a higher-level of analysis of impacts to this species by the California Department of Fish and Wildlife (CDFW) from proposed land use activities on both federal, state, local, and private lands. If California is going to have any hope of avoiding the extinction of its state reptile, Agassiz's desert tortoise, and reverse the current decline of the tortoise to move toward recovery, the Commission must act by changing the listing status of this species from Threatened to Endangered.

1. **POPULATION TRENDS**

Describe current population trends (with numbers and rate) and relate these to viable population numbers. Explain survey methodology used to arrive at numbers or estimates and what assumptions, if any, were involved.

Background:

Population Sampling Methodologies

Permanent Study Plots: In the late 1970s, the Bureau of Land Management implemented a sampling methodology to collect demographic data on desert tortoises at 47 study plots in the spring. The method was to survey the sites intensively, locating all living tortoises and shell remains (BLM 2002). From these 47 plots, BLM selected and established 15 permanent one square mile study plots at various locations in the three Recovery Units (Figure 1) for the desert tortoise in the California Desert Conservation Area – Western Mojave, Colorado Desert, and Eastern Mojave (BLM 2002, Berry 2003) (See Tables 1a and 1b below). One hundred percent of each plot was surveyed twice for live desert tortoises and tortoise sign (e.g., burrows, scat, tracks, etc.). Surveys occurred in spring for 60 days. Density estimates were determined using mark-recapture sampling methods. Abundance, sex ratio, mortality, size distribution, and other population attributes were determined from the data collected. Most study plots were surveyed from every year to every 10 years (Berry 2003). The results of the surveys were applied to adjacent areas.

From the data collected, BLM reported the abundance of all size classes of desert tortoises (e.g., hatchlings, juveniles, immatures, subadults, and adults), mortality, population density and trend, size-specific sex ratios, age structure, survivorship rates, and causes of mortality at the size class and population levels in the California desert when compared to prior surveys at each plot. BLM in Nevada and Utah implemented this methodology in 1981 and Arizona in 1987 (USFWS 2010). BLM surveyed these study plots until 1995 when the U.S. Geological Survey assumed the task in California (BLM 2002; BLM et al. 2005).

The permanent study plot method had its downsides and assumptions. These include:

- Because of the intensive search effort needed to survey 100 percent of each plot, most study plots were not surveyed annually.
- Placement of permanent study plots was not random.
- Generally, plots were located where densities of tortoises were found to be high. This placement was done to get an adequate sample size to determine density using mark-recapture calculations. Thus, density estimates from study plots when applied to adjacent areas could be greater or less than the actual densities.
- The assumption that tortoises do not enter or leave the study plot during the entire 60-day spring survey period is not likely being met for the mark-recapture method.
- Tracy et al. (2004) concluded that it was not appropriate to extrapolate data from these plots to serve as a range-wide population baseline from which to assess recovery.

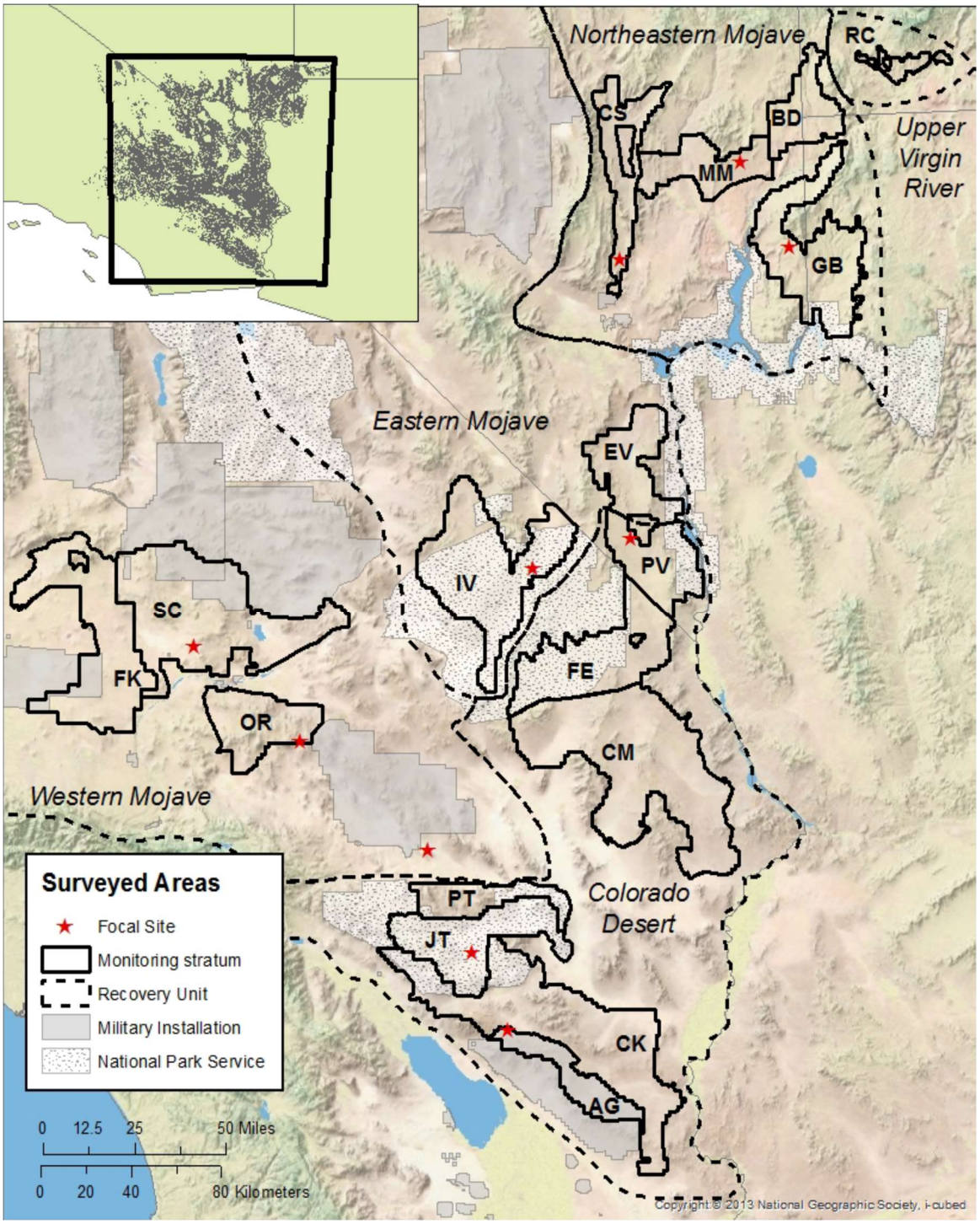


Figure 1. Map of the Recovery Units and Critical Habitat Units (CHUs) for Agassiz's desert tortoise. The CHUs in California are: FK = Fremont-Kramer, SC = Superior-Cronese, OR = Ord-Rodman, PT = Pinto Mountains, JT = Joshua Tree, CK = Chuckwalla, AG = Chocolate Mtns Aerial Gunnery Range, CM = Chemehuevi, FE = Fenner, IV = Ivanpah.

Line Distance Sampling: In June 1999, the interagency Desert Tortoise Management Oversight Group (DTMOG) adopted line distance sampling as the method for estimating adult desert tortoise abundance and density on a rangewide basis, and to detect long-term population trends (Anderson and Burnham 1996). This sampling method is intended to document rangewide population trends for adult desert tortoises over time and to determine whether the goals and objectives in the Recovery Plan regarding tortoise densities are being met. This monitoring strategy uses annual surveys on randomly placed line distance transects, with effort levels designed to detect long-term population trends (e.g., 10-year trends) in adult tortoises. This method was used beginning in 2001 by experienced survey crews under the direction of the USFWS DTRO, who publishes annual reports of line distance survey result reports (e.g., USFWS 2019a, 2020).

The downsides and assumptions of line distance sampling include:

- Line distance sampling collects data only to estimate the density of live adult tortoises. No systematic methodology is used to collect data on other population attributes (e.g., sex ratio, carcasses (mortality), cause of death, abundance or density of hatchling or juvenile tortoises, or short-term changes to population characteristics such as a catastrophic decline or remarkable increase) (USFWS 2006).
- Transects are not located randomly throughout the range of the desert tortoise. Rather, they are located randomly within CHUs, due to funding constraints and logistical issues. This methodology leaves occupied tortoise habitat outside these areas and areas needed for connectivity between CHUs/TCAs/Desert Wildlife Management Areas (DWMAs) unsurveyed.
- There are no trend data for tortoise populations outside CHUs.
- CHUs are more likely to be managed for the tortoise and its habitat than habitat outside CHUs and more likely to have greater densities of tortoises than areas outside CHUs. Therefore, the density estimates for adult tortoises in CHUs obtained from line distance sampling would likely be greater than for areas outside the CHUs in tortoise habitat and greater than rangewide density estimates. Thus, the line distance sampling does not provide a rangewide density estimate; it provides a density estimate for CHUs.
- Like permanent study plots, CHUs are not surveyed annually but about once every 3 years.
- Results from the range-wide line distance sampling survey program for population monitoring in CHUs/TCAs/DWMAs are intended to provide a baseline from which recovery criteria for stable populations within recovery units may be measured (USFWS 2006). However, collection of this baseline data was started in 2001. This is 12 years after listing Agassiz's desert tortoise as under CESA and ESA. Desert tortoise densities and abundance continued to decline from 1989/1990 (date of listings) to 2001. Using tortoise densities obtained from 2001 and later implies that although

listed as threatened, the densities of tortoises could decline further and still achieve recovery. A more appropriate approach would have been to use densities at the date of listing as the baseline.

CHUs for Agassiz's desert tortoises receive, in theory, greater protection under ESA provisions for federal actions because of the prohibition of adversely modifying or destroying Critical Habitat under ESA Section 7(a)(2). In spite of this prohibition, recent programmatic plans by the BLM in the California deserts have designated Extensive Recreation Management Areas (ERMAs) and Special Recreation Management Areas (SRMAs) in hundreds of thousands of acres of Critical Habitat for the tortoise (BLM 2016). BLM has also opened Cuddeback and Coyote dry lake beds within Critical Habitats in the Western Mojave Desert to unrestricted motorized vehicle use (BLM 2019).

With greater protection afforded to desert tortoise habitat within designated Critical Habitat, one would assume that tortoise populations occurring in Critical Habitat would have higher densities, a higher probability of recovery, and upward population trends over time with implementation of developed recovery plan actions. However, when analyzing the data from multiple years of line distance sampling, this assumption, has proven incorrect (Berry et al. 2014, USFWS 2015), and exactly the opposite. (See "Line Distance Sampling Results.")

Population Viability for Agassiz's Desert Tortoise

In the 1994 Recovery Plan for the Mojave Population of the Desert Tortoise, the USFWS determined that the minimum viable tortoise population density is 3.9 adults per square kilometer, or approximately 10 per square mile. In calculating this detailed population viability analysis, many assumptions were factored into this analysis, including a male-female ratio of 1:1 (i.e., the number of female tortoises should not be less than the number of male tortoises) (USFWS 1994a), and certain minimum areas of conserved habitat (reserves) would be established and managed, with most of these areas geographically linked by adjacent borders or corridors of suitable tortoise habitat. Populations of Mojave desert tortoises with densities below this amount are not viable and in danger of extinction (USFWS 1994a).

At the time the 1994 Recovery Plan was written, there was less consideration of the potentially important role of drought and climate change in the desert ecosystem, and with regard to desert tortoises and tortoise habitats in particular. In the meantime, studies have documented vulnerability of juvenile (Wilson et al., 2001) and adult tortoises (Peterson 1994, 1996; Henen 1997; Longshore et al., 2003) to drought (USFWS 2006).

The analysis of population viability for the desert tortoise used (1) population densities as of the early 1990s and size of reserves (i.e., areas managed for the desert tortoise), and (2) the population numbers (abundance) as of the early

1990s and size of reserves. As population densities for the Mojave desert tortoise decline, reserve sizes must increase, and as population numbers (abundance) for the Mojave desert tortoise decline, reserve sizes must increase (USFWS 1994a).

Reserve design (USFWS 1994a) and designation of Critical Habitat were based on the population viability analysis from numbers (abundance) and densities of populations of the Mojave desert tortoise in the early 1990s. Inherent in this analysis is that the lands be managed with reserve level protection (USFWS 1994a) or ecosystem protection as described in section 2(b) of the federal ESA, and that sources of mortality be reduced so recruitment exceeds mortality (that is, lambda >1)(USFWS 1994a).

Permanent Study Plot Results

Since the permanent study plots were first established in the late 1970s to 2002, tortoise populations have experienced declines both in numbers of tortoises registered during the surveys and in densities of live tortoises (Berry and Medica 1995, Brown et al. 1999, Berry et al. 2002). Declines of >50% and up to 96% have occurred regardless of initial densities (Berry 2003). Declines in numbers and densities of live tortoises were confirmed by corresponding increases in carcasses, including remains of marked tortoises (Berry 2003).

Beginning in the 1980s, high tortoise mortality associated disease was documented throughout the western Mojave Desert, and shortly thereafter, in populations within the eastern Mojave Desert in California and Nevada. Disease outbreak was first detected in surveys at the Desert Tortoise Research Natural Area (DTRNA) study plot (Brown et al. 1999) on the west edge of what is now the Fremont-Kramer CHU and subsequently in populations in adjacent Critical Habitat Units (i.e., Fremont-Kramer and Superior-Cronese).

Table 1a. Estimated annual densities of adult Agassiz's desert tortoises (midline carapace length (MCL) >180 mm) during 60-day spring surveys using mark-recapture methodology at one square-mile permanent study plots in two of the three Agassiz's Desert Tortoise Recovery Units and Critical Habitat Units (CHUs)/Tortoise Conservation Areas (TCAs)/Desert Wildlife Management Areas (DWMAs) in California. Density is in adult tortoises/square-kilometer. DTRNA = Desert Tortoise Research Natural Area.

	Western Mojave Recovery Unit								**Eastern Mojave Recovery Unit**	
CHU/TCA/ DWMA	**Fremont-Kramer**				**Superior-Cronese**	**Ord-Rodman**			**Ivanpah**	
Permanent Study Plot	DTRNA Interpretive Plot	DTRNA Interior Plot	Fremont Valley Plot	Kramer Hills Plot	Plots established by National Training Center	Lucerne Valley	Johnson Valley	Stoddard Valley	Ivanpah	Shadow Valley
Year Surveyed										
1977									37- 46 (1)	
1979	56 (2)	34 (2,8)						20 (2)	40 (2)	XXX
1980				29 (3)		30-35 (3, 9)	23-26 (3, 9)			
1981									38-50 (4)	
1982				30 (5)						
1985	61 (6)									
1986						29 (9)	19 (9)		XXX	
1988										XXX
1989	XXX	61(8)								
1990						25 (9)	6 (9)		XXX	
1992										XXX
1993	XXX									
1994						25 (9)	6(9)		XXX	
1997	8 (7)									

XXX– Sampled but data unavailable

(1) Berry 1978
(2) Berry 1980, BLM et al. 2005
(3) Berry 1981, BLM et al. 2005
(4) Turner, F., et al. 1982. DTC Symposium
(5) Berry, Nicholson; Juarez, and Woodman 1986
(6) Berry Shields, Woodman, Campbell, Roberson, Bohuski, and Karl 1986
(7) Berry, Stockton, and Shields 1998
(8) Berry, Woodman, and Knowles 1989
(9) BLM and CDFG 2002
(10) BLM 2002

Table 1b. Estimated annual densities of adult Agassiz's desert tortoises (MCL >180 mm) during 60-day spring surveys using mark-recapture methodology at one-mile^2 permanent study plots in the third Agassiz's Desert Tortoise Recovery Unit and Critical Habitat Units (CHUs)/Tortoise Conservation Areas (TCAs)/Desert Wildlife Management Areas (DWMAs) in California. Density is in adult tortoises/kilometers^2.

	Colorado Desert Recovery Unit								
CHU/TCA/ DWMA	**Chuckwalla**		**Chemehuevi**		**Fenner**		**Joshua Tree**	**Pinto Mountains**	**Chocolate Mtns AGR**
Permanent Study Plot / **Year Surveyed**	Chuckwalla Valley II Plot	Chuckwalla Bench Plot	Chemehuevi Wash Plot	Ward Valley Plot	Fenner	Goffs	Joshua Tree	No study plots	No study plots
1978							17-18 (1)		
1979		59 (5)	12-16 (2,5)						
1980	17(5,6)			29 (4,6)		61 (4)			
1982		61 (5)	15 (5)						
1983						XXX			
1984						XXX			
1985						XXX			
1986						XXX			
1987	XXX			XXX					
1988		43 (6)	XXX						
1990		XXX				XXX			
1991	XXX			XXX			45* (3)		
1992		XXX	XXX				51* (3)		
1993							47* (3)		
1994						XXX			
1995				XXX					
1996			XXX						
1997		XXX							
2000						XXX			

(1) Barrow 1979
(2) Berry 1980
(3) Freilich, J. and B. Moon 1993* Densities reported for all tortoises rather than adults.
(4) Berry 1981
(5) Berry, Nicholson; Juarez, and Woodman 1986
(6) Berry 1981
(7) Berry, Woodman, and Knowles 1989

XXX – Sampled this year but data unavailable

In the Western Mojave Recovery Unit, between 1982 and 1992, the overall tortoise population at the DTRNA declined by 86% with the adult population declining by about 94%, primarily due to *Mycoplasmosis* disease mortality (Brown et al. 1999). Juvenile tortoise mortality occurred primarily from Common raven (*Corvus corax*) predation. Tracy et al. (2004) concluded that the apparent downward trend in desert tortoise populations in the western portion of the range (Western Mojave Recovery Unit) that was identified at the time of listing from permanent study plot data was valid and ongoing from several threats including disease.

In the Colorado Desert Recovery Unit, BLM and CDFG (2002) reported that populations of desert tortoises "have declined precipitously in some parts of the range, such as the Chuckwalla Bench….Population estimates of permanent study plots at Chemehuevi Valley and Chuckwalla Bench have shown declines as high as 90 percent over the past decade" (i.e., early 1990s to 2000s).

Surveys in the eastern Mojave Desert (i.e., Goffs, California) (Colorado Desert Recovery Unit) have found high levels of Agassiz's desert tortoise mortality attributable to tortoise shell (*dyskeratosis*) and respiratory tract (*mycoplasmosis*) diseases (Berry 2000). Surveys performed in 2000, eleven years after state listing of the desert tortoise as Threatened, revealed that all tortoise size classes in sampled eastern Mojave Desert Critical Habitats had declined by as much as 76-80% from previous tortoise population estimates. The decline rate in larger tortoise size classes, which have a greater reproductive contribution to the population [i.e., larger females produced larger clutch sizes (Wallis et al. 1999)], was estimated to have declined by as much as 90% from previous estimates (Berry 2000, BLM 2002).

Lovich (2016) reported on the trend of desert tortoise densities in Joshua Tree National Park (Colorado Desert Recovery Unit). He noted tortoise populations "decreased in size during droughts." And, "What was once a robust and large population of tortoises in the early 1990s declined precipitously by 2012."

In the Eastern Mojave Recovery Unit in California, surveys performed in 2000, eleven years after state listing of the desert tortoise as Threatened, revealed that all tortoise age classes sampled in the CHUs of the Eastern Mojave Recovery Unit had declined by as much as 76-80% from previous tortoise population estimates. The decline rate in larger tortoise size/age classes, which have a greater reproductive contribution to the population, was estimated to have declined by as much as 90% from previous estimates (Berry 2000).

Line Distance Sampling Results

The USFWS Desert Tortoise Recovery Office has published reports of annual line distance sampling results since 2001 (e.g., USFWS 2019a, 2020). The first multi-year report was issued in 2006 for years 2001-2005.

Below are the results of line distance surveys by year (2001-2019) and change in estimated abundance of adult tortoises by Recovery Unit and Critical Habitat Unit in

California (Table 2) (USFWS 2006, 2009, 2010, 2011, 2012b, 1012c, 2013, 2014, 2015, 2016a, 2018, 2019, 2020).

Table 2. Density of adult Agassiz's desert tortoises (>180 mm MCL) per km^2 by year (2001-2018) in Critical Habitat Units designated for the species within California.

Year	Western Mojave Critical Habitat Unit			Eastern Mojave Critical Habitat Unit	Colorado Desert Critical Habitat Unit					
	Fremont-Kramer	Superior-Cronese	Ord-Rodman	Ivanpah	Chuckwalla	Chemehuevi	Fenner	Chocolate Mountains AGGR	Pinto Mountains	Joshua Tree
2001	5.5	4.3	10.1	2.8	10.1	7.2	15.7	No data	6.5	5.8
2002	4.7	8.1	13.1	5.4	7.7	No data	3.7	No data	4.0	3.3
2003	3.4	7.8	4.1	No data	4.0	6.3	2.8	No data	3.8	2.7
2004	6.1	4.5	5.2	4.7	6.4	6.9	8.7	No data	2.2	1.7
2005	5.7	6.7	8.1	4.6	7.9	10.8	14.0	No data	10.3	2.8
2006	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data
2007	2.7	6.3	8.2	6.5	4.5	4.6	6.6	7.1	2.4	2.8
2008	0.4	1.4	3.8	3.8	3.2	3.6	5.0	3.4	2.5	1.8
2009	3.3	4.9	7.1	4.0	0.0	9.2	8.1	7.3	5.0	2.3
2010	2.5	2.6	7.5	1.0	3.7	4.2	6.9	13.8	3.4	2.8
2011	3.5	3.4	3.2	4.5	3.9	4.0	6.8	No data	3.3	3.5
2012	2.2	4.4	4.6	2.8	3.9	0.8	0.9	6.1	3.7	3.4
2013	No data	No data	No data	No data	No data	No data	No data	7.3	No data	No data
2014	4.7	2.5	3.5	2.3	3.3	2.8	4.8	8.4	2.4	3.7
2015	4.5	2.6	No data	1.9	No data	No data	No data	10.3	No data	No data
2016	No data	3.6	No data	No data	No data	1.7	5.5	8.5	2.1	2.6
2017	4.1	1.7	3.9	No data	4.3	No data	No data	9.4	2.3	3.6
2018	No data	No data	2.5/3.4*	3.7	No data	2.9	6.0	7.6	No data	No data
2019	2.7	1.9	2.1	2.6	1.8	No data	2.8	7.0	1.7	3.1

*Density of 2.5 adult tortoises per km^2 in the Ord-Rodman CHU is for resident tortoises only. The 3.4 adult tortoises per km^2 includes the tortoises translocated from the expansion area of the Marine Corps Air Ground Combat Center to Ord-Rodman CHU that were found during transect sampling.

USFWS (2006) reported low tortoise densities across recovery units from 2001-2005 and are indicative of a continuing long-term decline of tortoise abundance and population densities throughout the Mojave and Colorado deserts in California. This decline was first reported in the 1980s and resulted in the Commission listing the desert tortoise as Threatened in 1989 and USFWS following in 1990.

In their 2015 report, the USFWS provides an aggregate analysis of the data from 2004 through 2014 to determine the trend of adult desert tortoise (>180 mm midline carapace length) densities and abundance from rangewide sampling in CHUs/TCAs/DWMAs (Table 3).

Table 3. Summary of 10-year trend data (from 2004 to 2014) for Recovery Units and Critical Habitat Units (CHU)/Tortoise Conservation Areas (TCA)/Desert Wildlife Management Areas (DWMAs) for Agassiz's desert tortoise, *Gopherus agassizii* (=Mojave desert tortoise*)* in California The table includes the area of each Recovery Unit and CHU/TCA/DWMA, percent of total habitat for each Recovery Unit and CHU/TCA/DWMA, density (number of breeding adults/km^2 and standard errors = SE), and the percent change in population density between 2004-2014. Populations below the viable level of 3.9 breeding individuals/km^2 (10 breeding individuals per mi^2) (assumes a 1:1 sex ratio (i.e., number of adult females equal to or greater than adult males) and showing a decline from 2004 to 2014 are in red (USFWS 2015).

Recovery Unit Designated Critical Habitat Unit/Tortoise Conservation Area/Desert Wildlife Management Area	Surveyed area (km^2)	% of total habitat area in Recovery Unit & CHU/TCA	2014 density/km^2 (SE)	% 10-year change (2004–2014)
Western Mojave, CA	**6,294**	**24.51**	**2.8 (1.0)**	**–50.7 decline**
Fremont-Kramer	2,347	9.14	2.6 (1.0)	**–50.6 decline**
Ord-Rodman	852	3.32	3.6 (1.4)	**–56.5 decline**
Superior-Cronese	3,094	12.05	2.4 (0.9)	**–61.5 decline**
Colorado Desert, CA	**11,663**	**45.42**	**4.0 (1.4)**	**–36.25 decline**
Chocolate Mtn AGR, CA	713	2.78	7.2 (2.8)	**–29.77 decline**
Chuckwalla, CA	2,818	10.97	3.3 (1.3)	**–37.43 decline**
Chemehuevi, CA	3,763	14.65	2.8 (1.1)	**–64.70 decline**
Fenner, CA	1,782	6.94	4.8 (1.9)	**–52.86 decline**
Joshua Tree, CA	1,152	4.49	3.7 (1.5)	+178.62 increase
Pinto Mtn, CA	508	1.98	2.4 (1.0)	**–60.30 decline**
Eastern Mojave, CA	**3,446**	**13.42**	**1.9 (0.7)**	**–67.26 decline**
Ivanpah, CA	2,447	9.53	2.3 (0.9)	**–56.05 decline**

Using line distance sampling data, Defenders of Wildlife prepared a series of graphs showing the population trend of adult desert tortoises from 2001 within CHUs in California, including a line showing the minimum viable density threshold of 3.9 adults per square kilometer, and a projected date of extirpation or extinction (Attachment 1).

An analysis of these data indicate:

- The aggregate adult tortoise densities in the Western Mojave Recovery Unit, Colorado Desert Recovery Unit, and Eastern Mojave Recovery Unit in

California were below the population viability density of 3.9 adult tortoises per km^2.

- At the CHU/TCA/DWMA population level, 9 of the 10 populations in these Recovery Units in California were below this viability density.
- For percent change in population abundance between 2004 and 2014, all populations in the three CHUs/TCAs/DWMAs except one (Joshua Tree National Park) experienced a decline.
- For percent change in population abundance in 2014 using 2004 data as a baseline, the aggregate change in all Recovery Units in California experienced declines ranging from 36 to 67 percent.
- In the Western Mojave Recovery Unit at the population level, the three populations experienced 50 to 61 percent declines.
- In the Colorado Desert Recovery Unit in California, five of six populations experienced 29 to 64 percent declines.
- In the Eastern Mojave Recovery Unit in California, the Ivanpah population experienced a 56 percent decline.
- Only the Joshua Tree population in the Colorado Desert Recovery Unit had an increase in population abundance. Despite this 178 percent increase, its population density was below the 3.9 tortoises per km^2 population viability level.

The population viability analysis in the 1994 Recovery Plan assumed a 1:1 male - female sex ratio and used the estimated densities of tortoises in the early 1990s in the analysis to calculate the population viability density. Unfortunately, we were unable to find information in the USFWS reports on the sex ratios of these populations. Therefore, we are unable to determine if this assumption is being met. A male - female sex ratio that favors males would require a greater population density than 3.9 adult tortoises per square kilometer for a population to be viable.

In addition, the density and abundance of desert tortoises has declined substantially in the Western Mojave Recovery Unit, Colorado Desert Recovery Unit, and Eastern Mojave Recovery Unit since the population viability analysis was published in the 1994 Recovery Plan. Consequently, the minimum viable density for tortoise populations may now be greater than the 3.9 adult tortoises per km^2 (10 adult tortoises per m^{i2}) because population density estimates in the 1990s were used to calculate the population viability density along with other parameters.

In their analysis of the USFWS's 2015 Line Distance Survey Report, Allison and McLuckie (2018) reported:

"*Populations of the Mojave Desert Tortoise (Gopherus agassizii) experienced severe declines in abundance in the decades leading up to 1990, when the species was listed as threatened under the U.S. Endangered Species Act. Prevailing declines in the abundance of adults overall and in four of the five recovery units indicate the need for more aggressive implementation of recovery actions and more critical evaluation of the suite of future activities and projects in tortoise habitat that may exacerbate ongoing population declines. Adult densities in the* [California recovery units] *declined at different annual rates: Colorado Desert (-4.5%, Eastern Mojave*

(-11.2%), and Western Mojave (-7.1%). Of the four recovery units in which we used two-pass surveys, the probability of encountering a juvenile was consistently lowest in the Western Mojave Recovery Unit.

Overall this threatened species is experiencing large, ongoing population declines, and adult tortoise numbers have decreased by over 50% in some recovery units since 2004. Declining adult densities through 2014 have left the Western Mojave adult numbers at 49% and in the Eastern Mojave at 33% of their 2004 levels. Such steep declines in the density of adults are only sustainable if there were suitably large improvements in reproduction and juvenile growth and survival. However, the proportion of juveniles has not increased anywhere since 2007, and in these two recovery units the proportion of juveniles in 2014 has declined to 91% and 77% of their representation in 2004, respectively.

Throughout our assessment, we describe tortoise status based on adult densities, which is useful for comparison of areas of different sizes. However, if the area available to tortoises is decreasing, then trends in tortoise density no longer capture the magnitude of decreases in abundance. Some of the area of potential habitat (68,501 km^2) has certainly been modified in a way that decreases the number of tortoises present.

We used area estimates that removed impervious surfaces created by development as cities in the desert expanded. However, we did not address degradation and loss of habitat from recent expansion of military operations (753.4 km^2 so far on Fort Irwin and the MCAGCC [in addition to training/bombing lands expanded at China Lake Naval Weapons Center]*… the current range-wide distance sampling program provides fairly coarse but clear summaries of patterns in tortoise density and abundance, definitive because they sample regionally and range-wide.*

The negative population trends in most of the TCAs for Mojave Desert Tortoises indicate that this species is on the path to extinction under current conditions. This may reflect inadequate recovery action implementation, slow response by tortoises and their habitat to implemented actions, or new and ongoing human activities in the desert that have not been mitigated appropriately.

It may also be a result of stochastic or directional climatic events that impact large expanses of tortoise habitat (e.g., drought, fire, climate change) and are largely beyond the realm of local land management activities. Our results are a call to action to remove ongoing threats to tortoises from TCAs, and possibly to contemplate the role of human activities outside TCAs and their impact on tortoise populations inside them."

Combining Permanent Study Plots and Line Distance Sampling Results

By the time formal line distance sampling of adult tortoise populations in California began in 2001, high levels of tortoise mortality had been documented and already reduced these populations by up to approximately 90%, such as in the Fremont-Kramer CHU in the Western Mojave Recovery Unit (USFWS 1994a).

As mentioned above, beginning in the 1980s, high tortoise mortality was reported in the three Recovery Units in California. Combining the adult density data from permanent study plots and line distance sampling for these three Recovery Units indicates a substantial long-term downward trend in the density of these desert tortoise populations (Attachment 2).

Agassiz's desert tortoise is a "K-strategist" (MacArthur and Wilson 1967, USFWS 1994a), with delayed maturity and long life under normal conditions. Its survival strategy is to live a long time and recruit a small number of individuals into the population to replenish the loss of adults or slowly increase the population size. However, given the numerous, increasing, and compounding threats to the desert tortoise (see Section 6 "Factors Affecting Ability to Survive and Reproduce") and the long-term downward trend in the density of reproducing adults, these data indicate that adults are not living a long time and recruitment is much lower than mortality. With most population densities in California below the minimum viable density, this long-term downward trend indicates the survival strategy of the desert tortoise has not been working for several decades. Agassiz's desert tortoise is on a path to extirpation in California.

Analyzing the line distance sampling data that spans 19 years, population declines of desert tortoises have been documented since 2001, currently resulting in a breeding adult tortoise density generally below the minimum population viability level of 3.9 tortoises per square kilometer in all but one of the tortoise Critical Habitat Units in California (USFWS 2020). Twenty-five years after the publication of the 1994 Recovery Plan, the USFWS has confirmed that the densities of the 10 tortoise populations in CHUs/TCAs/DWMAs in California are below this minimum viable density, except for the Chocolate Mountains. If the density estimates from line distance sampling in CHUs is below the minimum viable density, it is likely that the occupied habitats outside the CHUs have lower population densities, as Critical Habitat receives an additional regulatory level of management. This would mean that rangewide the density and abundance of the tortoise may not be as great as reported from line distance sampling.

In summary, the permanent study plots data and long-term monitoring data from the USFWS's line distance sampling show a multi-decadal decline in the density of adult desert tortoises in California. The line distance sampling shows the density of 9 of 10 populations of Agassiz's desert tortoise in the CHUs of the California desert are below the population viability density of 3.9 adult tortoises per km^2. All populations have experienced steep declines in abundance since 2004 except the Joshua Tree population. Between 2004 and 2014, nine populations continue to decline at substantial rates. If these rates of decline continue, the trajectory for extirpation of the tortoise in California will likely occur within the foreseeable future. This assumes that factors such as drought and climate change do not become worse and that human uses of desert lands do not increase substantially in the future. Based on past history and regional climate models, we know this is unlikely.

2. **RANGE AND DISTRIBUTION**

In the text, indicate the percentage of historic distribution that is in existence and the rate of loss. If appropriate, indicate the number of extant occurrences, populations or portions of populations in California. Indicate whether the rate of loss is accelerating, and estimate when extinction would occur if current trends continue. Discuss the relationship between historic and current acreage and degree of habitat fragmentation. Describe the quality of the existing habitats in terms of ability to maintain viable populations with or without enhancement.

The following information is from the report published by the USFWS DTRO, entitled "Status and Trend of the desert tortoise and its Critical Habitat in 2019" (USFWS 2019b):

Beginning in the 1970s *"the range and distribution of the Desert tortoise in California was initially mapped using observations of live individuals and their sign collected by the Bureau of Land Management during development of the California Desert Conservation Area Plan. Over 1,000 triangular transects were surveyed between 1978 and 1983 and were used to build a Desert tortoise occurrence map based on five classes of estimated abundance (0-20, 21-50, 51-100, 101-250, > 250 tortoises/mile. Further refinement of the occurrence and relative abundance of Desert tortoises in the Western Mojave Desert was completed by the Bureau of Land Management from 1998-1999 in support of the West Mojave Plan. Approximately 1,800 transects were performed*. *Within its range in California, habitat degradation and loss due to land-use practices include development (urban and rural), military training activities, habitat fragmentation from roads and utility corridors, recreational activities, and livestock grazing."*

In 2009, the US Geological Survey looked at the distribution of the desert tortoise by focusing on available habitat for the species (USFWS 2019b): *"Typical habitat of the desert tortoise in the Mojave Desert is characterized as Creosote Bush Scrub ranging in elevation from approximately 1,000 to 5,500 feet. A key habitat component within this habitat is a reliable food source in the form of annual forbs and grasses, which rely on annual precipitation ranging from approximately 2-8 inches. Based on an evaluation of environmental variables associated with occupied Desert tortoise habitat, U.S. Geological Survey researchers developed a habitat suitability model in 2009* (Nussear et al. 2009), *which provided the first accurate map of predicted occupied habitat for the species.*

The most apparent threats to the desert tortoise are those that result in mortality and permanent habitat loss across large areas, such as urbanization and large-scale renewable energy projects and those that fragment and degrade habitats, such as proliferation of roads and highways, off-highway vehicle (OHV) activity [including military training], wildfire, and habitat invasion by non-native invasive plant species.

Prior to 1994, desert tortoises were extirpated from large areas within their distributional limits by urban and agricultural development (e.g., the cities of Barstow and Lancaster, California; Las Vegas, Nevada; and St. George, Utah; etc.; agricultural areas south of Edwards Air Force Base and east of Barstow), military training (e.g., Fort Irwin, Leach Lake Gunnery Range), and off-highway vehicle use (e.g., portions of off-road management areas managed by the BLM and

unauthorized use in areas such as east of California City, California). Since 2010, the U.S. Fish and Wildlife concluded that the distribution of the Desert tortoise had not changed substantially in terms of the overall extent of its range, although desert tortoises have been removed from several thousand acres because of solar development, military activities, and other project development (USFWS 2010). In 2014, the U.S. Fish and Wildlife Service accounted for acres of non-habitat for the species (i.e., impervious surfaces that included paved and developed areas and other disturbed areas that have zero probability of supporting desert tortoises. Within California, impervious surfaces totaled 3,325,979 acres, or 19.2% of the total acres of modeled habitat for the species.

Other anthropogenic factors affect the physical and biological features of critical habitat in more subtle ways. Surface disturbance from OHV vehicle activity can cause erosion and large amounts of dust to be discharged into the air. Recent studies on surface dust impacts on gas exchanges in Mojave Desert shrubs showed that plants encrusted by dust have reduced photosynthesis and decreased water-use efficiency, which may decrease primary production during seasons when photosynthesis occurs.

Sharifi et al. (1997) also showed reduction in maximum leaf conductance, transpiration, and water-use efficiency due to dust. Leaf and stem temperatures were also shown to be higher in plants with leaf-surface dust. These effects may also impact [native] desert annuals, an important food source for desert tortoises.

Invasion of non-native plants can affect the quality and quantity of plant foods available to desert tortoises. Increased presence of invasive plants can also contribute to increased fire frequency. Proliferation of invasive plants is increasing in the Mojave and Sonoran deserts and is recognized as a substantial threat to desert tortoise habitat."

Substantial alteration of Agassiz's desert tortoise Critical Habitat occurred with the expansion of the U.S. Army's National Training Center at Fort Irwin in 2002, 13 years after listing of the species as Threatened by the California Fish and Game Commission. This federal action resulted in the transfer of approximately 99,000 acres of public land managed by the BLM in the Superior-Cronese Critical Habitat Unit of the Western Mojave Recovery Unit in California to the U.S. Army. (Charis 2005). The Army is now conducting mechanized warfare training, which directly impacts tortoise habitat, on approximately 18,000 of these acres in the Southern Expansion Area, and indirectly impacts additional habitat by creating large amounts of dust that are deposited in adjacent and downwind areas. The dust covers plants and reduces their ability to photosynthesize. It also reduces maximum leaf conductance, transpiration, and water-use efficiency (Sharifi et al. 1997). Thus, plant survival, growth, and reproduction are reduced. This reduces the availability of important forage plants (USFWS 2010) and cover for the tortoise from predators and temperature extremes. Military training activities spread the seeds and plant propagules of nonnative plant species in the tracks and tires of their vehicles and in their equipment. The remaining 62,000 acres of Critical Habitat in the Western Expansion Area have not been used for mechanized training to date, but the Army intends to utilize them at some future date (USFWS 2012a).

Prior to use of the 18,000 acres in the Southern Expansion Area, the Army in 2002 captured a total of 650 adult and sub-adult desert tortoises and translocated them to specific non-training lands within and adjacent to the installation. Roughly half of tortoises translocated died during or immediately after translocation. To date, tortoises have only been removed from the Southern Expansion Area where mechanized warfare training takes place (USFWS 2012a). Surveys in the 62,000 acre Western Expansion Area revealed that approximately 1,100 individuals would have to be captured and translocated before mechanized training could commence.

A second significant impact to Agassiz's desert tortoise habitat occurred in 2013, when the U.S. Navy expanded the U.S. Marine Corps Air Ground Combat Center (MCAGCC) into the eastern Johnson Valley by acquiring 154,000 acres of public land managed by the BLM and 13,971 acres of non-federal land (U.S. Marine Corps et al. 2016). Approximately 1,000 desert tortoises were captured and translocated from the area planned for active mechanized warfare training exercises into the adjacent Ord-Rodman CHU. The same direct and indirect impacts to tortoises and tortoise habitat from the National Training Center's expansion also occurred on the expansion lands of MCAGCC.

Between 2009 and 2019, ten solar energy generation projects were also approved on public lands supporting Agassiz's desert tortoise habitat in California, 20 years following state listing of the species as Threatened. As a result, a total of 31,578 acres of Agassiz's desert tortoise habitat on public land has been removed during this time, although none of these projects are located in Critical Habitat. Additional private land with significant tortoise habitat have also been developed for renewable energy projects. The estimated incidental take of Agassiz's desert tortoises for these projects total over 2,298 individuals to date, based on USFWS biological opinions and CESA Section 2081 incidental take permits. Authorization for additional incidental take in the future is anticipated due to continued development of solar energy facilities, primarily on federal land managed by the BLM.

Roads have been described as the single most destructive element in the process of habitat fragmentation (Noss 1993) and their ecological effects are considered "the sleeping giant of biological conservation" (Forman 2002:viii, as cited in van der Ree et al. 2011). Though roads comprise only 1% of surface area, an estimated 19% of the total land within the United States is ecologically affected by roads due to indirect effects that extend beyond the physical footprint of the road (Forman, 2000, as cited in Nafus et al. 2013).

There are approximately 15,000 miles of paved and maintained roads within the range of the Agassiz's desert tortoise in California (BLM 1999); and 5,997 miles of authorized off-highway vehicle routes within the western Mojave Desert (BLM 2005, 2019). These roads and routes and their use by vehicles have numerous adverse impacts on the desert tortoise and its habitat. They include (1) wildlife mortality from collisions with vehicles, collecting, and vandalism (McLellan and Shackleton 1988, Kilgo et al. 1998) (2) hindrance/barrier to animal movements thereby reducing access to resources and mates [fragmentation], (3) degradation of habitat quality [spread of non-native invasive plant species] (Parendes and Jones 2000), (4) habitat loss

caused by disturbance effects in the wider environment and from the physical occupation of land by the road, and (5) subdividing animal populations into smaller and more vulnerable fractions (at higher risk of localized extirpation from stochastic events or from inbreeding depression) (Jaeger et al. 2005a, 2005b, Roedembeck et al. 2007) (USFWS 1994a, Boarman 2002). A summary of the miles of routes and disturbed areas associated with motorized vehicle use within CHUs in the Western Mojave Recovery Unit is provided in Attachment 3.

For a herbivorous species such as the desert tortoise, roadside vegetation is often more robust and diverse because water that becomes concentrated along roadside berms promotes germination. This attracts tortoises and puts them at higher risk of mortality as road-kill (Boarman et al. 1997).

LaRue (1993) and Boarman et al. (1997) reported observing depauperate desert tortoise populations along highways. Subsequent research shows that populations may be depressed in a zone at least as far as 0.4 kilometers (0.25 miles) from the roadway on each side (Boarman and Sazaki 1996). The greater the distance from the road, the more desert tortoise sign is observed (LaRue 1993; Boarman et al. 1997; von Seckendorff Hoff and Marlow 2002; Boarman and Sazaki 1996). Similarly, the cover and richness of non-native plant species decreases as distance from the road increases (Boarman and Sazaki 1996).

In summary, the distribution of Agassiz's desert tortoise has been shrinking since its listing as threatened because of the myriad of land use projects throughout much of the tortoise's range in California. The larger individual projects (e.g., the expansion of the National Training Center at Fort Irwin and MCAGCC, and numerous large-scale renewable energy projects) and collectively, smaller development projects in/near the growing cities/communities of Palmdale-Lancaster, Victorville-Hesperia-Adelanto-Apple Valley, and Barstow-Lenwood continue to reduce the distribution of the tortoise near these communities. Thousands of miles of roads and routes of travel crisscross desert tortoise habitat effectively eliminating tortoises from thousands of acres of habitats adjacent to their corridors and fragment tortoise populations.

3. **ABUNDANCE**

Provide available historic and current population estimates/trends, densities, vigor, sex and age structures, and explain population changes relative to human-caused impacts or natural events. Compare current and historic abundance in terms of overall population size or size of occurrences, populations or portions of populations, as appropriate. Describe current population trends (with numbers and rate) and relate these to viable population numbers. Explain survey methodology used to arrive at numbers or estimates and what assumptions, if any, were involved.

As stated above in the Executive Summary and Section 1 (Population Trends), adult tortoise populations in Recovery Units in California have declined by 51.3% from 2004 through 2014 (i.e., from 119,029 tortoises in 2004 to 65,726 tortoises in 2014) (USFWS 2015). These declines were within tortoise Critical Habitat Units where there is a higher level of habitat protection expected to occur compared to lands outside these areas.

Densities of adult tortoises in CHUs within the Western Mojave Recovery Unit were estimated in 2004 to average 5.7 tortoises per square kilometer, in contrast to an average density of 2.8 tortoises per square kilometer estimated in 2014 – a decline similar to those occurring in all three Recovery Units in California (USFWS 2015). Historical survey data from permanent study plots in the Western Mojave Recovery Unit in the late 1970s and early 1980s were used to estimate adult tortoise densities in the 1994 Recovery Plan, which ranged from 2 to 96 per square kilometer at that time (USFWS 1994a) – indicating that adult tortoises in the Western Mojave Recovery Unit may have declined by as much as 85-95% from roughly 1980 to 2014. During this time Agassiz's desert tortoise had been state-listed as Threatened for 15 years.

These trend data indicate that under current management, Agassiz's desert tortoise populations within Critical Habitat Units in California continue to decline rapidly, which is inconsistent with the goals in the Recovery Plans of stabilizing and recovering depleted tortoise populations and halting habitat degradation – a situation that endangers the continued viability of wild tortoise populations in California. Still higher tortoise population declines, and greater degrees of habitat degradation, are known to occur outside of these Critical Habitat Units, possibly due to less restrictions placed on various public land use activities and private land development through regional and county land use plans [e.g., California Desert Conservation Area (CDCA) Plan (BLM 1980), as amended by the Desert Renewable Energy Conservation Plan (DRECP)].

Darst et al. (2013) developed a tortoise threats assessment that ranked the relative importance of threats to Agassiz's desert tortoise and its populations. These researchers determined that urbanization, human access, military operations, disease, and illegal use of off-highway vehicles were, and continue to be, the most significant threats on a range-wide basis.

In the 1994 rule designating Critical Habitat for the Mojave population of the desert tortoise, the USFWS (1994b) stated:

"*OHV use in the desert has increased and proliferated since the 1960s. As of 1980, OHV activities affected approximately 25 percent of all desert tortoise habitat in California*."

Various researchers have studied threats to tortoises and their populations. Tuma et al. (2016) conducted a detailed analysis of threats present in the Superior-Cronese Critical Habitat Unit in the Western Mojave Recovery Unit in California. These researchers concluded human presence was associated with significantly greater declines in tortoise populations because it was associated with habitat degradation and higher animal mortality on a continuous basis. This conclusion was reached even though human presence had a patchy distribution in the study area. Land use activities, such as vehicle use on/off authorized roads/trails, camping, mining, and livestock grazing; as well as habitat loss associated with housing subdivisions, freeways, transmission lines and railroads were identified in this study as a current suite of threats to Agassiz's desert tortoise. The second highest-ranked threat was

subsidized predators, which contribute to tortoise mortality on a continuous, widespread basis but without causing habitat loss or degradation.

The USFWS (2011) concluded in its revised recovery plan for the Mojave Population of the Desert Tortoise that:

"*The vast majority of threats to the desert tortoise or its habitat are associated with human land uses. The threats identified in the 1994 Recovery Plan formed the basis for listing the tortoise as a threatened species and continue to affect the species today*."

As stated in Section 1 ("Population Trends"), the USFWS (1994) has determined the minimum viable density of adult tortoises is 3.9 tortoises per square kilometer, and that populations with densities below this number are in danger of extirpation. Based on extensive (2001-2014) line distance sampling, the USFWS (2015) determined that the estimated density of adult tortoises within Critical Habitat within the Western Mojave Recovery Unit in California in 2014 had declined to 2.8 tortoises per square kilometer, which is below the minimum density to ensure population viability or persistence. For the Colorado Desert Recovery Unit, the estimated density of adult tortoises was 4.0 tortoises per square kilometer. Although just above the minimum viable density of 3.9 calculated for desert tortoises in 1994, this CHU had a declining trend of 36.25 % from 2004 to 2012. This declining trend likely means that the density of adult tortoise will be below the minimum viable density in the foreseeable future. The Eastern Mojave Recovery Unit in California had an estimated adult tortoise density of 2.3 tortoises per square kilometer and the estimated density for the entire Recovery Unit in California and Nevada was 1.9 tortoises per square kilometer. Like the Colorado Desert Recovery Unit, the Western Mojave and Eastern Mojave Recovery Units had declining trends of 50.7% and 63.7%, respectively (see Table 3 in Section 1 – "Population Trends"). Tortoise densities in 8 of 10 Critical Habitat Units in California are also below minimum viability (see Table 3 in Section 1 – "Population Trends").

In addition to these threats, there is the overarching threat of climate change. Regional climate change models for the southwest United States show that the area is already experiencing the effects of climate change. The average daily temperatures for the 2001–2010 decade were the highest in the southwestern United States from 1901 through 2010 (Overpeck et al. 2012) with temperatures almost 2.0 degrees Fahrenheit (1.1 degrees Celsius) higher than historic averages, with fewer cold snaps and more heat waves (Overpeck et al. 2012). Climate change models for the southwestern United States for the 21st century predict seasonal air and surface temperatures in all seasons will increase (Overpeck et al. 2012), with greater warming in summer and fall than winter and spring. Droughts in parts of the southwestern United States are projected to become greater in intensity (Overpeck et al. 2012) (i.e., more frequent and/or longer in duration) with a precipitation decrease westward through the Sonoran and Mojave Deserts. With precipitation decreasing as one moves farther west in the southwest U.S., this would mean that the western portion of the range of Agassiz's desert tortoise (i.e., the tortoises in California) would be most affected by this decrease in precipitation from climate change.

Perennial vegetation is being impacted by prolonged drought conditions in the Mojave Desert. The negative effects of long-term drought on Sonoran, Great Basin, and Mojave Desert perennial plants are well documented (Goldberg and Turner 1986; Turner 1990; Bowers 2005; Hereford et al. 2006; Miriti 2006; Hamerlynck and McAuliffe 2008; Hamerlynck and Huxman 2009; Ralphs and Banks 2009, as cited in Huggins et al. 2010), and include high shrub mortality, shrub canopy deterioration, and low plant recruitment.

In a portion of the Superior-Cronese CHU, die-offs of desert shrubs have been documented. Data from plant transects reveal that total shrub cover and volume have decreased significantly by roughly 10% between 2000 and 2009 (Huggins et al. 2010). Mortality of these long-lived shrubs has been high (48%), and the recruitment of new shrubs (5%) has been too low to maintain their populations at previous levels (Huggins et al. 2010).

If the climate models for the Southwest and Mojave and Colorado deserts are correct, as the westernmost deserts in the southwest, their drought periods will become longer and more frequent. These climatic conditions will result in reduced reproduction and recruitment and elevated mortality of native woody perennial vegetation needed by the desert tortoise for shelter from extreme weather conditions and cover from predators. It also means that the frequency and quantity of native annual and herbaceous perennial plants needed by the tortoise for adequate nutrition (see Section 5 “Kind of Habitat Necessary for Survival”) would be reduced further. Reductions in precipitation and availability of forage plants for tortoises would result in reduced tortoise survival, reproduction, and recruitment (Henen 1997; Henen 2002a; Henen 2002b; and Wallis et al. 1999) and reduced tortoise densities and abundance). Because 9 of the 10 tortoise populations in the three Recovery Units in California are below the population viability threshold, the tortoise cannot persist if its survival, reproduction, or recruitment will be reduced. The tortoise’s downward trend toward extirpation will continue.

Based on the best available scientific information (presented above), Agassiz’s desert tortoise is in danger of extirpation in Critical Habitat Units in California from a variety of human-related threats. Because line distance sampling represents estimates of desert tortoise densities and abundance rangewide, the data and analysis from line distance sampling shows that Agassiz’s desert tortoise is in danger of extirpation in the three Recovery Units in California - the Western Mojave Recovery Unit, the Colorado Desert Recovery Unit, and the Eastern Mojave Recovery Unit.

Defenders of Wildlife, the Desert Tortoise Council and the Desert Tortoise Preserve Committee believe changing the regulatory status of Agassiz’s desert tortoise from Threatened to Endangered under CESA provisions will result in a higher level of impact analyses for proposed land use activities and greater long-term protection of occupied habitats. Mitigation requirements to avoid, minimize, and compensate for adverse impacts under Endangered vs. Threatened status would likely be greater and more effective in halting population declines and habitat loss/degradation, and in

contributing to recovery of the species. Funding available for conservation projects for recovery of Endangered vs. Threatened species would also likely be greater.

4. LIFE HISTORY (SPECIES DESCRIPTION, BIOLOGY, AND ECOLOGY)

Include pertinent information that is available on species identification, taxonomy and systematics, seasonal activity or phenology, reproductive biology, mortality/natality, longevity, growth rate, growth form, food habits, habitat relationships and ecological niche or ecological attributes, interactions with other species or special habitat requirements that may increase vulnerability of the species to certain natural or human-caused adverse impacts (e.g., obligate wetland or riparian habitat species, low birthrate, colonial species).

This information is available in the supporting documents for the 1989 listing of the desert tortoise as Threatened by the Commission, as well as in the supporting documents for federal listing as Threatened by the USFWS. Additional information is available in the 1994 Recovery Plan (USFWS 1994a) and the 2011 Revised Recovery Plan (USFWS 2011). A summary is provided below from the Status of the Desert Tortoise (USFWS 2019b) and Andersen et al. (2000), and the two desert tortoise recovery plans.

The desert tortoise is a large, herbivorous reptile that reaches 20 to 38 centimeters (8 to 15 inches) in carapace (upper shell) length and 10 to 15 centimeters (4 to 6 inches) in shell height. Hatchlings emerge from eggs at about 5 centimeters (2 inches) in length. During the first 5 to 7 years of life, the tortoise shell is incompletely ossified; it is soft and easy to puncture and rip open (Boarman 2002). This makes small tortoises highly vulnerable to predation by a variety of mammals and birds. Adult desert tortoises weigh 3.6 to 6.8 kilograms (8 to 15 pounds). The forelimbs have heavy, claw-like scales and are flattened for digging. Hind limbs are more elephantine (Ernst et al. 1994).

Desert tortoise behavior is well adapted to living in a highly variable and often harsh desert environment. They spend much of their lives in burrows that they excavate, even during their seasons of activity. Burrows are made under rocks or in soil and may be as much as 5 m in length but are usually 1 m deep (Burge 1978, Bulova 1994). Patterns of burrow use are sex specific (Bailey et al. 1995) and may reflect complex social interactions among individual tortoises (Bulova 1994). Burrow living can make tortoises difficult to find, particularly in drought years when the animals seal themselves behind a wall of dirt and stay underground to conserve water.

In late winter or early spring, they emerge from overwintering burrows and typically remain active through fall. Activity decreases in summer, but tortoises often emerge after summer rain storms to drink (Henen et al. 1998). During activity periods, desert tortoises eat a wide variety of herbaceous vegetation, particularly perennial grasses and the flowers of annual plants (Berry 1974; Luckenbach 1982; Esque 1994). Tortoises are selective in the plant species and plant parts that they eat. Oftedal et al. (2002) reported that plant species and plant parts of species eaten by desert tortoises were higher in water, protein, and potassium excretion potential (PEP), and lower in potassium than uneaten species and parts. During periods of inactivity, they reduce

their metabolism and water loss and consume very little food by remaining in their burrows. Adult desert tortoises lose water at such a slow rate that they can survive for more than a year without access to free water (obtaining it from their food, if available) and can apparently tolerate large imbalances in their water and energy budgets (Nagy and Medica 1986; Peterson 1996; Henen et al. 1998) at least for a limited time.

Desert tortoises are essentially “K-strategists” (MacArthur and Wilson 1967), with delayed maturity and long life. Eggs and hatchlings are quite vulnerable, and pre-reproductive adult mortality averages 98% (Wilbur and Morin 1988, Turner et al. 1987). Adults, however, are well protected against most predators (other than humans) and other environmental hazards and consequently can be long-lived (Germano 1992, Turner et al. 1987). Their longevity helps compensate for their variable annual reproductive success, which is correlated with environmental conditions.

Mating occurs both during spring and fall (Black 1976; Rostal et al. 1994). In drought years, the availability of surface water following rains may be crucial for desert tortoise survival (Nagy and Medica 1986). During these unfavorable periods, desert tortoises decrease surface activity and remain mostly inactive or dormant underground (Duda et al. 1999), which reduces water loss and minimizes energy expenditures (Nagy and Medica 1986). Duda et al. (1999) showed that home range size, number of different burrows used, average distances traveled per day, and levels of surface activity were significantly reduced during drought years.

The size of desert tortoise home ranges varies with respect to location and year (Berry 1986) and also serves as an indicator of resource availability and opportunity for reproduction and social interactions (O’Connor et al. 1994). Females have long-term home ranges that may be as little or less than half that of the average male, which can range to 80 or more hectares (200 acres) (Burge 1977; Berry 1986a; Duda et al. 1999; Harless et al. 2009). Core areas used within tortoises’ larger home ranges depend on the number of burrows used within those areas (Harless et al. 2009). Over its lifetime, each desert tortoise may use more than 3.9 square kilometers (1.5 square miles) of habitat and may make periodic forays of more than 11 kilometers (7 miles) at a time (Berry 1986).

Tortoises are long-lived and grow slowly, requiring 13 to 20 years to reach sexual maturity, and have low reproductive rates during a long period of reproductive potential (Turner et al. 1984; Bury 1987; Germano 1994). Growth rates are greater in wet years with higher annual plant production (e.g., desert tortoises grew an average of 12.3 millimeters [0.5 inch] in an El Niño year compared to 1.8 millimeters [0.07 inches] in a drought year in Rock Valley, Nevada (Medica et al. 1975). The number of eggs as well as the number of clutches that a female desert tortoise can produce in a season is dependent on a variety of factors including environment, habitat, availability of forage and drinking water, and physiological condition (Turner et al. 1986, 1987; Henen 1997; McLuckie and Fridell 2002). The success rate of clutches has proven difficult to measure, but predation, while highly variable (Bjurlin and Bissonette 2004), appears to play an important role in clutch failure (Germano 1994).

Although Agassiz's desert tortoise occurs from the western Mojave Desert in California east to southwestern Utah, it consists of populations that show differences in genetics, morphology, ecology, and behavior (USFWS 2011). The USFWS used differences in genetic, ecological, and physiological characteristics to help delineate boundaries or other differences between Recovery Units. The designation of Recovery Units ensures that local adaptation as well as critical genetic diversity are maintained for Agassiz's desert tortoise (USFWS 2011). Hence, there are three Recovery Units for the desert tortoise in California.

5. **KIND OF HABITAT NECESSARY FOR SURVIVAL**

Describe habitat features that are thought to be important to the species' ability to maintain viable population levels. Any or all of the following features may be included, as appropriate:

Plant community; edaphic conditions; climate; light; topography/microtopography; natural disturbance; interactions with other plants or animals; associated species; elevation; migration or movement corridors; wintering habitat; breeding habitat; foraging habitat; other habitat features.

Suitable habitat for the species has been previously described in a U.S. Geological Survey (USGS) tortoise habitat model, as cited above in this Petition. However, we are providing a description of habitat characteristics below (from Nussear 2009, USFWS 1994a, USFWS 1994b, and USFWS 2011).

The habitat requirements of Agassiz's desert include sufficient suitable quantity and quality of plants for forage and cover, suitable substrates for burrow and nest sites, and low occurrence of predators. Throughout most of the Mojave region, desert tortoises occur primarily on flats and bajadas with soils ranging from sand to sandy-gravel, characterized vegetationally by scattered shrubs and abundant inter-shrub space for growth of herbaceous plants. Desert tortoises are also found on rocky terrain and slopes in parts of the Mojave region, and there is significant geographic variation in the way desert tortoises use available resources.

In the Mojave Desert, annual precipitation within known habitat ranges from 100 to 210 mm (Germano et al. 1994), mostly occurring during the winter months (> 50-75%) and infrequently as snow below 1,200 m. The temperature range within known habitat is extreme, with average daily low temperatures in January typically at or slightly below 0 ºC and average daily high temperatures in July ranging from 37 to 43 ºC (Germano et al. 1994).

In California, the desert tortoise uses the following vegetation communities:

- In the Colorado Desert Recovery Unit, vegetation communities include Succulent Scrub *(Fouquieria, Opuntia, Yucca),* Blue Palo Verde-Smoke Tree Woodland, Creosote Bush Scrub (lava flows), Blue Palo Verde-Ironwood-Smoke Tree Woodland, and Creosote Bush Scrub (rocky slopes).
- In the Eastern Mojave Recovery Unit, vegetation communities include Big Galleta-Scrub Steppe, Succulent Scrub *(Yucca, Opuntia* species), Creosote

Bush Scrub, Cheesebush Scrub (east Mojave type), and Indian Rice Grass Scrub-Steppe.

- In the Western Mojave Desert, vegetation communities include Mojave Saltbush- Allscale Scrub (endemic), Indian Rice Grass Scrub-Steppe, Hopsage Scrub, Big Galleta Scrub Steppe, Cheesebush Scrub (west Mojave type), Desert Psammophytes, and Blackbush Scrub.

The USFWS has determined that the physical and biological features (referred to as the primary constituent elements) of critical habitat that support nesting, foraging, sheltering, dispersal, and gene flow are essential to the conservation of the desert tortoise. The specific physical and biological features of Mojave desert tortoise critical habitat are:

- sufficient space to support viable populations within each of the recovery units and to provide for movement, dispersal, and gene flow;
- sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species;
- suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and
- habitat protected from disturbance and human-caused mortality.

Forage quantity and quality is limited in the range of the Mojave desert tortoise. In the Mojave and Colorado deserts, many food plants are high in potassium (Minnich 1979), which is difficult for desert tortoises to excrete due to the lack of salt glands that are found in other reptilian herbivores such as chuckwallas (*Sauromalus obesus*) and desert iguanas (*Dipsosaurus dorsalis*) (Minnich 1970; Nagy 1972). Reptiles are also unable to produce concentrated urine, which further complicates the ability for desert tortoises to expel excess potassium (Oftedal and Allen 1996). Oftedal (2002) suggested that desert tortoises may be vulnerable to disease as a result of physiological stress associated with foraging on food plants with insufficient water and nitrogen to counteract the negative effects of dietary potassium. Only high quality food plants (as expressed by the Potassium Excretion Potential, or PEP, index) allow substantial storage of protein (nitrogen) that is used for growth and reproduction, or to sustain the animals during drought. Non-native, annual grasses have lower PEP indices than most native forbs (Oftedal 2002; Oftedal et al. 2002). Oftedal et al. (2002) found that foraging juvenile tortoises favored water-rich, high-PEP, native forbs. Much of the nutritional difference between available and selected forage was attributable to avoidance of abundant, non-native split grass (*Schismus* spp.) with mature fruit, which is very low in water, protein, and PEP. Of the species eaten, *Camissonia claviformis*, a native Mojave desert primrose, accounted for nearly 50 percent of all bites, even though it accounted for less than 5 percent of the biomass encountered, and was largely responsible for the high PEP of the overall diet. Impacts to vegetation (such as livestock grazing, invasion of non-native plants [from use of roadways], and soil disturbance) that reduce the abundance and distribution of high PEP plants may result in additional challenges for foraging desert tortoises (Oftedal et al. 2002).

Non-native grasses are not as nutritious as native forbs. Recent studies have shown that calcium and phosphorus availability are higher in forbs than in grasses and that desert tortoises lose phosphorus when feeding on grasses but gain phosphorus when eating forbs (Hazard et al. 2010).

As previously stated in Section 1 “Population Density,” for the desert tortoise to survive and recover, its habitat should be managed with reserve level protection (USFWS 1994a). A reserve has a primary goal of protecting biodiversity from harmful activities and processes, both natural and anthropogenic. Thus, reserve level protection for Agassiz’s desert tortoise requires substantially reducing the direct and indirect impacts to the tortoise and its habitats that cause/contribute to its mortality and its recruitment if lambda is less than 1. Section 6 “Factors Affecting the Ability to Survive and Reproduce” includes a figure of the human-caused impacts to the habitat of the desert tortoise that results in mortality.

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;
(2) overexploitation;
(3) predation;
(4) competition;
(5) disease; or
(6) other natural events or human-related activities.

Identify the direct, indirect, and cumulative adverse impacts and discuss how these are contributing to the decline of the species. Indicate whether the species is vulnerable to random catastrophic events.

Information on these factors (e.g., habitat modification/destruction, predation, disease, etc.) has been provided in the above responses. A summary of these anthropomorphic threats and their interactions is provided in Figure 2 (below).

In addition, the desert tortoise is vulnerable to catastrophic events such as wildfire and flooding. Wildfire threat has increased dramatically over the past 100 years due to colonization of tortoise habitat by invasive, non-native species such as cheatgrass (*Bromus tectorum*), red brome (*Bromus madritensis* ssp. *rubens*) and Mediterranean splitgrass (*Schismus barbatus*). These annual grasses germinate early, compete with and displace native species of forbs and grasses for moisture and nutrients (Brooks 1999a, Brooks 1999b).

These non-native plants also form a dense and expansive layer of dry plant material in shrub communities at the end of the growing season that is highly flammable – substantially contributing to an area’s wildfire fuel load. Affected native plant communities can sometimes recover from wildfire over an extensive time period; but many become type-converted to a flammable grass community following intense fire,

resulting in a modified tortoise habitat of generally low quality which generally lacks constituent elements of this species' native habitat (Brooks and Esque 2002, Brooks and Matchett 2003).

While flooding due to intense monsoon thunderstorms is relatively common in the eastern half of the species range in California, and rare in the western half, recent climate models predict that more frequent and intense thunderstorms are anticipated over time as a result of climate change. Overall rainfall is expected to decrease, but intense storms will likely become more common. Three climate model projections for the California Desert region show increased precipitation during winter months over the entire area, but one model predicts the greatest rainfall increase in winter and also a large increase in summer precipitation. One climate change model projects increasing precipitation throughout the 21st century with a much wetter future overall despite a decline in spring and, to a lesser extent, fall rains (Bachelet et al. 2016).

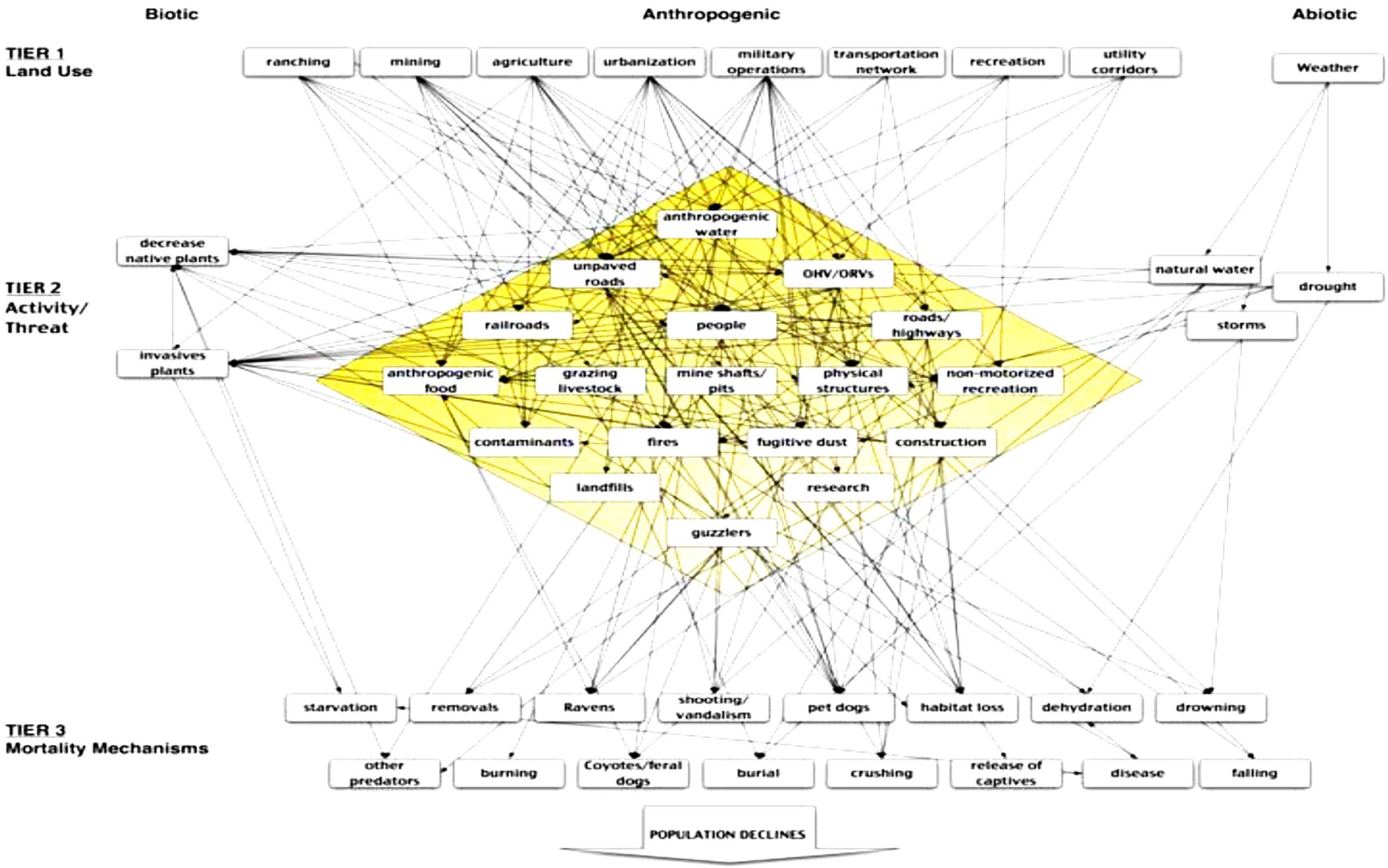


Figure 2. Network of threats demonstrating the interconnectedness between multiple human activities that interact to adversely impact tortoise populations. Tier 1 includes the major land use patterns that facilitate various activities (Tier 2) that impact tortoise populations through a suite of mortality factors (Tier 3). (From Tracy et al. 2004)

7. **DEGREE AND IMMEDIACY OF THREAT**

Indicate the immediacy of the threat and the magnitude of loss or rate of decline that has occurred to the present or is expected to occur without protective measures.

Desert tortoise populations in California have declined by approximately 90% since surveys were initially conducted starting in 1975, and also declined by over 50% since line-distance sampling began in 2004. Nine out of 10 populations in critical habitat units are now below the minimum viable density of adult tortoises (3.9/km^2 or 10/mi^2), and the steep population declines are continuing. This situation results in populations that have little or no resilience to stochastic events (e.g., drought, disease, fire, etc.) and are likely to become extinct in the foreseeable future.

Additional protective measures need to be implemented immediately to prevent desert tortoise populations from becoming extinct in California. Conservation and recovery actions funded and implemented to date have proven ineffective as demonstrated through line-distance sampling and the annual reports published by the Desert Tortoise Recovery Office. There is an urgent need to ensure the survival of adult tortoises, and especially reproductive females, so that populations can slowly recover; and to drastically reduce loss of hatchling and immature individuals due to predation by excessive raven populations.

Detailed information on threats to Agassiz's desert tortoise are described above in Sections 1 ("Population Trends"), 2 ("Range and Distribution"), 3 ("Abundance") and 6 ("Factors Affecting Ability to Survive and Reproduce").

8. **IMPACT OF EXISTING MANAGEMENT EFFORTS**

Describe any ongoing protective measures or existing management plans for the species or its habitat. Information on species or land management activities that are impacting populations or portions of the range and information on proposed land-use changes should be included. This may be best accomplished by discussing populations or portions of the range, where a chart display may be useful.

Include available information on any or all of the following:

> *(1) property ownership/jurisdiction for known populations or portions of the range;*
>
> The following information on property ownership/jurisdiction for populations of the desert tortoise in California is from the USFWS Federal Register Notice on designation of critical habitat (USFWS 1994B) and additional land acquisition and jurisdictional changes occurring after 1994:
>
> 4,754,000 acres of critical habitat was designated in California with the following ownership/jurisdictions and acreage:
>
> - BLM: 2,968,300 acres
> - National Park Service: 828,000 acres

- Department of Defense: 450,200 acres
- State of California: 132,900 acres
- Private: 1,051,500 acres

Current and historic desert tortoise habitat loss, deterioration, and fragmentation is largely attributable to urban development, military operations, and multiple-uses off public land, such as off-highway vehicle (OHV) activities and livestock grazing.

(2) current land use;

Federal land managed by the BLM: These federal lands are managed by BLM under provisions in the CDCA Plan, most recently amended by the DRECP and the West Mojave Plan, and are managed to provide a variety of multiple uses including livestock grazing, utility rights of way, livestock grazing, OHV use, wildlife habitat management, wilderness and wild and scenic rivers. The CDCA Plan prohibits or restricts some lands uses within desert tortoise conservation areas, such as renewable energy projects and pipelines, but the plan has been amended many times to allow for these uses to occur. We anticipate that the BLM will propose to significantly diminish biological resources conservation lands and conservation actions in the near future when it releases an amended DRECP.

Federal land managed by the National Park Service: These federal lands are located within the Mojave National Preserve and Joshua Tree National Park. They are managed under provisions of General Management Plans, which emphasize natural and cultural resources protection.

Lands managed by the State of California: These lands are managed primarily by the California Department of Parks and Recreation and state parks and preserves, and by the California Department of Fish and Wildlife as State Wildlife Areas and State Ecological Reserves. High quality habitat for the desert tortoise occurs in the Western Mojave and Fremont Valley Ecological Reserves. The are managed for conservation with limited public use allowed, but unauthorized OHV use frequently occurs due to limited law enforcement capability.

Federal land managed by the Department of Defense: These federal lands are located within four large installations (China Lake Naval Air Weapons Station, Edwards Air Force Base, Fort Irwin, the Marine Corps Air Ground Combat Center, and the Chocolate Mountains Gunnery Range). They are used primarily for weapons development and testing, aircraft testing and research, and military training. Natural resources within these installations, including the desert tortoise, are managed under provisions of Integrated Natural Resource Management Plans.

Private lands: Private lands designated as critical habitat are typically interspersed among federal lands managed by the BLM and National Park Service. They are managed by local agencies under county General Plans for a variety of land uses that include residential development, agriculture, open space, mining, etc. Activities that would impact the desert tortoise or adversely modify critical habitat would require the project proponent to obtain an incidental take permit from the

CDFW and USFWS, the latter of which would require preparation and implementation of a Habitat Conservation Plan.

(3) protective measures being taken, if any, and effectiveness of current management activities;

Federal lands have a variety of protective measures in place to minimize or compensate for adverse impact to the desert tortoise and its habitat. The most protective measures are associated with National Park Service General Management Plans for the Mojave National Preserve and Joshua Tree National Park where conservation of natural and cultural resources is paramount. However, with high public visitation, these park units have experienced loss of desert tortoises due to mortality due to vehicle strikes. Speed limit signing and law enforcement patrols have had little effect in reducing threats due to vehicle strikes.

Department of Defense lands have a wide range of effects on the desert tortoise and its habitat. Installations used for large-scale mechanized training and live-fire of weapons (e.g., Fort Irwin and the Marine Corps Air Ground Combat Center) have resulted in loss and fragmentation of habitat and loss of tortoise hatchlings and juveniles that were not detected during capture and translocation operations. However, activities at the China Lake Naval Air Weapons Station and Edwards Air Force Base typically do not disturb significant amounts of habitat because their weapons development and testing activities occur within designated military airspace, with very limited use of habitat for weapons impact sites.

In order to minimize direct mortality of desert tortoises from large-scale projects, such as solar energy generation facilities, the CDFW and USFWS typically require that desert tortoises be captured and translocated to secured habitat as close to the site as possible, and that the project site be fenced to prevent tortoises from entering the facility. Translocation is considered an experimental technique to minimize mortality, but it has undergone improvements over time, resulting in higher levels of tortoise survival following translocation in the short-term. Long term effects are being studied. Short-term adverse impacts documented through field studies include mortality due to environmental exposure, elevated predation, dehydration and lower reproductive activity.

(4) current research on the species;

Current research on the desert tortoise includes:

1) annual population estimates in Critical Habitat Units using line distance sampling;

2) disease occurrence and related mortality;

3) toxic elements in blood and liver tissue;

4) experimental translocation,

5) captive breeding and survival of young individuals into natural settings; and

6) existing management/recovery plans and the extent of their implementation.

The initial and subsequent recovery plans include recommendations for management of the species and its habitat that will contribute to the goal of recovery and eventual delisting, provided recovery goals are met.

With regard to the 1994 recovery plan, the USFWS stated in its 1994 rule (USFWS 1994b) for designation of Critical Habitat, that "*Desert tortoise populations have declined substantially throughout the Mojave Region in the last 2 decades, primarily due to habitat loss. These populations grow slowly, and significant improvement in the status of the Mojave population will be a very long process, measured in decades or centuries in most parts of the Mojave Region*."

Although the USFWS designated Critical Habitat for the Mojave population of the desert tortoise in 1994, it stated in the final rule (USFWS 1994b):

"*Designating critical habitat does not create a management plan, it does not establish numerical population goals, it does not prescribe specific management actions (inside or outside of critical habitat), nor does it have a direct effect on areas not designated as critical habitat. Specific management recommendations for critical habitat are more appropriately addressed in recovery plans, management plans, and section 7 consultations*."

Of the 4,754,000 acres of Critical Habitat in California, 2,968,300 acres are public lands managed by the BLM. Recovery of the species is largely dependent on provisions in that agency's CDCA Plan that protect Critical as well as non-Critical Habitat (e.g., linkage habitats between CHUs) through effective and timely implementation of specific management actions that reduce threats, and protect

and restore elements of the habitat that Agassiz's desert tortoise requires for survival, growth and reproduction.

Subsequent to the federal listing of the desert tortoise as threatened in 1990, the CDCA Plan was amended through several regional plan amendments that added goals and objectives and specific management actions intended to contribute to the recovery of the species. A few of these regional plan amendments included:

1) Northern and Eastern Mojave Plan (BLM 2002);
2) Northern and Eastern Colorado Desert Plan (BLM and CDFG 2002);
3) Western Colorado Desert Plan (BLM 2003):
4) West Mojave Plan (BLM et al. 2006); and
5) Desert Renewable Energy Conservation Plan (BLM 2016)

BLM's 2002, 2003 and 2006 regional plan amendments to the CDCA Plan established Areas of Critical Environmental Concern (ACECs) and associated land use restrictions to protect tortoise habitat; largely corresponding to Critical Habitat designated for the species in 1994. These amendments allowed off-highway vehicle use to continue on designated open routes, as well as livestock grazing with limitations on season of use and forage utilization.

These plan amendments did not envision renewable energy development demand on public lands, an issue that emerged in approximately 2007 when right-of-way applications for large-scale solar energy and wind energy projects were filed with the BLM on over 100,000 acres of public land. As a result, 10 large-scale solar energy projects were approved in occupied tortoise habitat, outside of Critical Habitat in the Ivanpah Valley, Chuckwalla Valley, Blythe Mesa and the central Mojave of California, totaling 31,578 acres.

Off-highway vehicle routes were also designated in these regional plan amendments within Agassiz's desert tortoise habitat as open, closed or, in rare instances, as limited to certain types of vehicles. BLM's route designation on 3 million acres of public land in the West Mojave Plan (WEMO) area was found to have violated the provisions of the National Environmental Policy Act, Executive Orders, and regulations governing the use of off-highway vehicles on public land, and the CDCA Plan.

Subsequently, BLM (2019) revised the WEMO Plan route designation to address these legal deficiencies. Defenders of Wildlife urged the CDFW to review and comment on this plan when it was being developed, but that did not happen. Unfortunately, the final plan established open routes and livestock grazing in Critical Habitat that were largely the same as in the 2006 WEMO Plan, with a few deleterious additions, including promoting unrestricted motorized vehicle use on

dry lake beds in Critical Habitat and introducing competitive event corridors through Critical Habitat.

In its request for formal consultation with the USFWS, the BLM determined the DRECP amendments of 2016 to the CDCA Plan would adversely affect both Agassiz's desert tortoise and its Critical Habitat. It is noteworthy that the DRECP established "development caps" within tortoise ACECs ranging from 0.1% - 0.5%; the latter of which applies to all Critical Habitat Units. However, these development caps do not include the effects of livestock grazing or indirect effects of off-highway vehicle use and development projects whose impacts extend beyond the direct footprint of the projects and vehicle routes. Standardized compensatory mitigation ratios were also established at 5:1 in Critical Habitat and 1:1 outside of Critical Habitat; and 2:1 within mapped tortoise habitat linkages that connect conservation areas (i.e., ACECs).

Although these various amendments to the CDCA Plan were intended to contribute to the recovery of Agassiz's desert tortoise (e.g., BLM 2016, BLM et al. 2005), the results of line distance sampling conducted by the USFWS DTRO show those intentions have not been met. They show tortoise populations in all Critical Habitat Units within California as continuing to decline rapidly, with most below the minimum viable density of 3.9 adults per square kilometer.

In its biological opinion for the DRECP adopted by the BLM in 2016, the USFWS (2016b) stated:

"*Despite the implementation of these actions, disturbance and human-caused mortality continue to occur in many areas of critical habitat (which overlap the desert wildlife management areas for the most part and are the management units for which most data are collected) to the extent that the conservation value and function of critical habitat is, to some degree, compromised*."

And that,

"*Unauthorized off-road vehicle use continues to disturb habitat and result in loss of vegetation within the boundaries of critical habitat (e.g., Coolgardie Mesa in the Western Mojave Recovery Unit); although we have not documented the death of desert tortoises as a direct result of this activity, it likely occurs. Additionally, the habitat disturbance caused by this unauthorized activity exacerbates the spread of invasive plants, which displace native plants that are important forage for the desert tortoise, thereby increasing the physiological stress faced by desert tortoises*."

The USFWS (2016b) also concluded that under the DRECP amendments:

"*…development of renewable energy facilities …would remove or degrade up to 11,290 acres of desert tortoise habitat within the action area*."

Of these, 4,734 acres are within Critical Habitat. However, the biological opinion does not address the effects of future renewable energy projects that may be proposed outside of Development Focus Areas (DFAs) for renewable energy; namely public lands now termed General Public Lands and Variance Process Lands.

The only documented exception to these ongoing declines is in the DTRNA in the Western Mojave Recovery Unit. The USFWS did not designate Critical Habitat for Agassiz's desert tortoise in this area because the existing reserve-level protection provisions largely eliminated threats to the species and its habitat, including:

1) closure to all off-highway vehicle use;
2) closure to all livestock grazing;
3) closure to mineral development; and
4) a protective perimeter fence to prevent trespass of vehicles and livestock.

Recent field research has confirmed that these protective actions have been effective in reversing ongoing declines in the Agassiz's desert tortoise population within the DTRNA compared to adjacent areas lacking these protective measures.

Berry et al. (2014) surveyed 260 km^2 in the Western Mojave Desert to evaluate relationships between condition of tortoise populations and habitat on lands that have experienced three different levels of management and protection. The DTRNA was most protected; Critical Habitat designated for the desert tortoise in the Western Rand Mountains Area of Critical Environmental Concern was considered moderately protected; and private lands were considered to have no protection.

The researchers found that live tortoise density was:

1) Six-times greater inside the DTRNA compared to adjacent Critical Habitat where intensive off-highway vehicle use occurs on a designated route network; and
2) Four-times greater than on adjacent private lands.

The crude annual death rates for adult tortoises was lowest in the DTRNA (2.8% per year), followed by private lands (6.3% per year) and Critical Habitat (20.4% per year). The high death rates in Critical Habitat were of particular

concern. When causes of death could be determined, they included vehicle crushing, gunshot, and predation by ravens and mammals.

(6) *Proposed land-use changes (include knowledge of forthcoming California Environmental Quality Act documents that may or should address impacts, and lead agencies involved);*

On 2/1/2018, the BLM issued a notice it intended to amend the DRECP in response to President Trump's executive orders requiring federal agencies to review regulations that unnecessarily impede energy development and deployment of broadband telecommunication facilities. We anticipate that BLM will propose amendments to the DRECP that reduce conservation lands designated in 2016, allow renewable energy development in ACECs and eliminate compensatory mitigation for land uses that adversely impact habitat for various focal species, including the desert tortoise. Proposed amendments to the DRECP are expected to be released for public review and comment in the spring of 2020. The BLM's notice is available here: https://www.blm.gov/california/BLM-to-consider-changes-desert-renewable-energy-conservation-plan.

(7) *County general plans, federal and State agency plans/actions or other plans/actions that address or should address the species*.

At this time, we are aware of only one local agency plan that places restrictions on development of renewable energy projects on private land, the Renewable Energy and Conservation Element of the San Bernardino County General Plan. That element of the General Plan restricts utility-scale solar energy development to private lands within DFAs designated by the BLM.

9. SUGGESTIONS FOR FUTURE MANAGEMENT

Describe activities that may be necessary to ensure future survival of the species after listing or delisting. Include recommendations for any or all of the following:

Although the desert tortoise is currently listed as threatened under the CESA and ESA, we provide recommendations for additional management actions that would promote its recovery under applicable items, below.

(1) *activities that would protect existing populations (site maintenance, preserve design establishment, etc.);*

While a majority of Agassiz's desert tortoise Critical Habitat in California has been designated as ACECs by the BLM for habitat protection and to promote recovery of the species, the types and intensity of land use activities allowed and

authorized on a regular basis within these areas continue to adversely impact the species. These ACECs should be managed as biological reserves in a manner similar to the DTRNA, where activities that adversely impact the species are largely prohibited (e.g., off-highway vehicle use, use of unlicensed motorized vehicles, and livestock grazing). This management level was stated in the 1994 Recovery Plan as a recovery action. However, this is not occurring.

Fencing highways and roads with tortoise exclusion fence would eliminate these linear features as population sinks and greater reduce the "road effect zone." This action would reduce tortoise mortality. Fencing highways is occurring in Nevada.

(2) *monitoring programs and studies;*

Science-based systematic monitoring of the impacts of off-highway vehicle use and livestock grazing is needed to assess the magnitude and extent of impact these activities have on Agassiz's desert tortoise, which would be used to develop additional protective measures or restrictions through the adaptive management process. Such systematic monitoring has not been initiated in California.

However, the BLM and others have developed an extensive bibliography of reliable information on the known adverse impacts of both recreational vehicle use and livestock grazing upon Agassiz's desert tortoise, some of which follows:

D.S. Ouren, et al. 2007. Report prepared for U.S. Geological Survey. Environmental Effects of Off-highway Vehicles on Bureau of Land Management Lands: A Literature Synthesis, Annotated Bibliographies, Extensive Bibliographies, and Internet Resources. Open File Report 2007-1353. https://pubs.usgs.gov/of/2007/1353/report.pdf.

R.H. Webb. H.G. Wilshire. 1983. Environmental Effects of Off-highway Vehicles. Impacts and Management in Arid Regions. https://www.springer.com/gp/book/9781461254560.

H.G. Wilshire, J.E. Nielson, and R.W. Hazlett. 2008. The American West at Risk. Science, Myths, and Politics of Land Abuse and Recovery. https://onlinelibrary.wiley.com/doi/full/10.1002/ldr.1070.

D.L. Donahue. 1999. The Western Range Revisited. Removing Livestock from Public Lands to Conserve Native Biodiversity. https://digitalrepository.unm.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1572&context=nrj.

(3) *needed amendments to existing management and land-use plans, including county general plans;*

The CDCA Plan is the primary document guiding management of public lands and was initially adopted in 1980 and amended many times over the past 39 years, such as by the DRECP in 2016 and by earlier regional plan amendments, identified above. The BLM finalized the West Mojave Plan Route Network and Livestock Grazing amendments to the CDCA Plan in 2019. (https://www.blm.gov/programs/planning-and-nepa/plans-development/california/west-mojave-plan-route-network).

Based on a thorough review of the CDCA Plan, we recommend that it be further amended to:

- eliminate livestock grazing in desert tortoise Critical Habitat and habitat linkages;
  restrict the use of unlicensed or non-street legal off-highway vehicles to BLM-designated Open Areas;
- close and restore all redundant vehicle routes in desert tortoise Critical Habitat and habitat linkages;
- establish a 15 mile per hour vehicle speed limit in all desert tortoise Critical Habitat;
- establish seasonal and/or temporary closure of motorized vehicle routes to off-highway vehicle use during the spring season and during precipitation events when standing water is on dirt roads and trails; and
- enforce existing restrictions and the restrictions suggested above in Critical Habitat areas.

(4) *agencies/organizations that should be involved in planning and implementing management and recovery actions;*

BLM (California Desert District and Field Offices); Department of Defense (Fort Irwin, MCAGCC, China Lake, Edwards Air Force Base, Chocolate Mountain Aerial Gunnery Range); California Department of Parks and Recreation; CDFW; Caltrans; respective planning departments in Kern County, San Bernardino County, Riverside County, Imperial County, and Inyo County.

(5*) other activities that would help protect existing habitat or ensure survival of the species;*

Plan for and implement effective and timely control of common raven populations within all Desert Tortoise Recovery Units with priority given to Critical Habitat Units within the Western Mojave Recovery Unit.

(6) *how other sensitive species (listed and unlisted) may benefit from protection of this species*; and

(7); *how other species/habitats may be impacted by management and recovery activities for this species*.

The state-listed Threatened Mohave ground squirrel would benefit because its declining range overlaps with the Agassiz's desert tortoise in large portions of the Western Mojave Recovery Unit. In addition, several federal and state-listed and sensitive plant species would benefit, such as the Barstow woolly sunflower, Desert cymopterus, Lane Mountain milk-vetch, Mojave monkeyflower, Mojave tarplant, Parish's daisy, and Triple-ribbed milk-vetch.

(8*) at what point this species would be considered stable and sustainable.*

The U.S. Fish and Wildlife established recovery criteria for the desert tortoise in its 1994 and Revised 2011 Recovery Plans. Recovery criteria include the management or elimination of threats, and addressing the five statutory delisting factors. However, at the time the Revised Recovery Plan was finalized, the USFWS considered the following three criteria applicable due to lack of information on the degree of threat posed by certain activities.

Recovery Objective 1 (Demography). Maintain self-sustaining populations of desert tortoises within each Recovery Unit into the future.

> *Recovery Criterion 1. Rates of population change (λ) for desert tortoises are increasing (i.e., λ > 1) over at least 25 years (a single tortoise generation).*

Recovery Objective 2 (Distribution). Maintain well-distributed populations of desert tortoises throughout each Recovery Unit.

> *Recovery Criterion 2. Distribution of desert tortoises throughout each tortoise conservation area is increasing over at least 25 years (i.e., ψ [occupancy] > 0).*

Recovery Objective 3 (Habitat). Ensure that habitat within each Recovery Unit is protected and managed to support long-term viability of desert tortoise populations.

> *Recovery Criterion 3. The quantity of desert tortoise habitat within each desert TCA is maintained with no net loss until tortoise population*

viability is ensured. When parameters relating habitat quality to tortoise populations are defined and a mechanism to track these parameters established, the condition of desert tortoise habitat should also be demonstrably improving.

The Revised Recovery Plan estimated that if all the recovery actions were implemented and were successful, desert tortoise recovery would be expected to occur by the year 2025. However, since none of the recovery criteria have been met, especially positive rates of change in populations over at least 25 years, recovery will take much longer, likely multiple decades or perhaps over 100 years.

10. AVAILABILITY AND SOURCES OF INFORMATION

Cite literature, available specimen collection records, and other pertinent reference materials. Attach documents critical to the recommended action. Be sure to include recent status surveys. List names, addresses, and telephone numbers of persons providing unpublished information and list those supporting the recommended action.

All cited literature used in this petition are identified above and full citations are included in Attachment 4 (Literature Cited), with many having website links to documents. Additional sources of information in support of this petition include:

U.S. Fish and Wildlife Service, Desert Tortoise Recovery Office. https://www.fws.gov/nevada/desert_tortoise/dtro/

Desert Tortoise Council Symposium (1976-2019) Text-searchable Proceedings https://deserttortoise.org/annual-symposium/symposium-proceedings/

Desert Tortoise Council Plans and Best Management Practices https://deserttortoise.org/library/plans-bmps/

Berry, K.H., Lyren, L.M., Mack, J.S., Brand, L.A., and Wood, D.A., 2016, Desert tortoise annotated bibliography, 1991–2015: U.S. Geological Survey Open-File Report 2016-1023, 312 p., http://dx.doi.org/10.3133/ofr20161023.

J.P. Hohman, R.D. Ohmart, and J. Schwartzmann. 1980. An Annotated Bibliography of the Desert Tortoise, Gopherus agassizii. Desert Tortoise Council Special Publication No. 1. https://deserttortoise.org/ocr_DTCdocs/1980.1AnnotatedBibliography-DesertTortoise-OCR.pdf.

11. DETAILED DISTRIBUTION MAP

Delineate on appropriate maps the historic and present distribution (estimated if not known). Include one map of California showing general distribution, and U.S. Geological Survey topographical maps (or equivalent) of appropriate scale, for more detailed distribution information, including locations of occurrences, populations or portions of populations, as appropriate. Include historic and current distribution as documented by literature, museum records, California Natural Diversity Data Base and other California Department of Fish and Wildlife records, and testimony of knowledgeable individuals. All maps must be suitable for black and white reproduction and fully labeled, including borders, base map name, map scale and species name, and should not exceed 11" x 14" in size.

Distribution maps of the desert tortoise are available on the following website links:

https://www.fws.gov/nevada/desert_tortoise/dt/images/tortoisemap-large.jpg

https://www.fws.gov/nevada/desert_tortoise/documents/publications/2013-Conserving-popln-linkages-mdt.pdf

https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=2660&inline=1

CONCLUSION

Thirty years after its listing as Threatened under provisions of the California and federal Endangered Species Acts, Agassiz's desert tortoise is in much worse condition than it was in 1990, and the number and severity of threats have increased. Threats to the species at the time of the 1990 federal listing as Threatened have not abated; they are becoming more widespread and intense.

Tortoises and their habitats are impacted by a myriad of authorized and illegal human activities that degrade or eliminate suitable creosote bush scrub and other vegetation communities needed as habitat, subsidize predators whose increased numbers prey on tortoises, and facilitate invasion of non-native species of plants that degrade habitat quality and displace native forbs and grasses needed for adequate nutrition and reproduction/recruitment.

Based on systematic USFWS-funded line distance sampling conducted by the Service's Desert Tortoise Recovery Office, from 2004 through 2014, adult tortoises in the three California Recovery Units declined by 51.3 percent over 10 years; and 9 of the 10 populations in these Recovery Units in California were below viability density. This decline is a continuation of an ongoing decline since the 1980s as documented by the data from permanent study plots on the CHUs and Recovery Units for the tortoise in California.

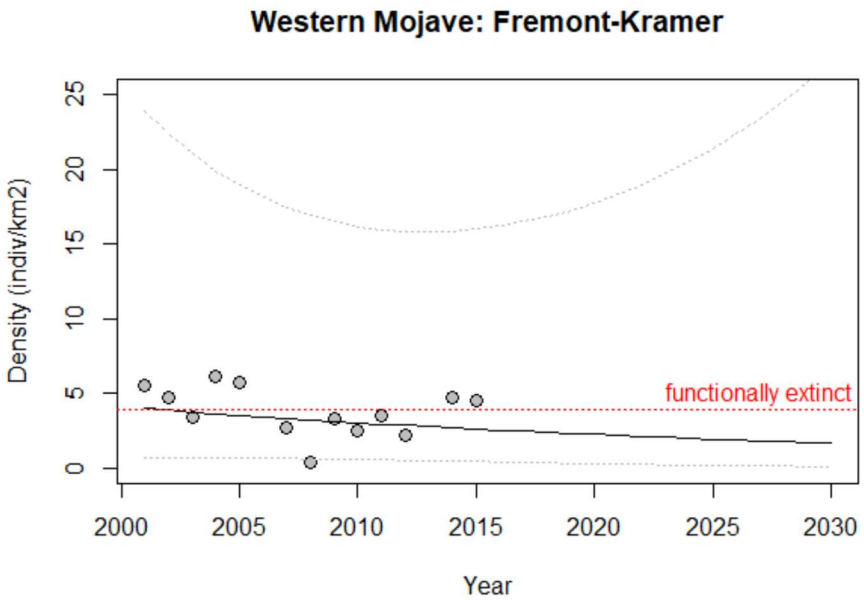
Based on the best available scientific information, as identified and summarized in this petition, naturally-occurring populations of Agassiz's desert tortoise are on the verge of extirpation in California from a variety of human-related threats. Defenders of Wildlife,

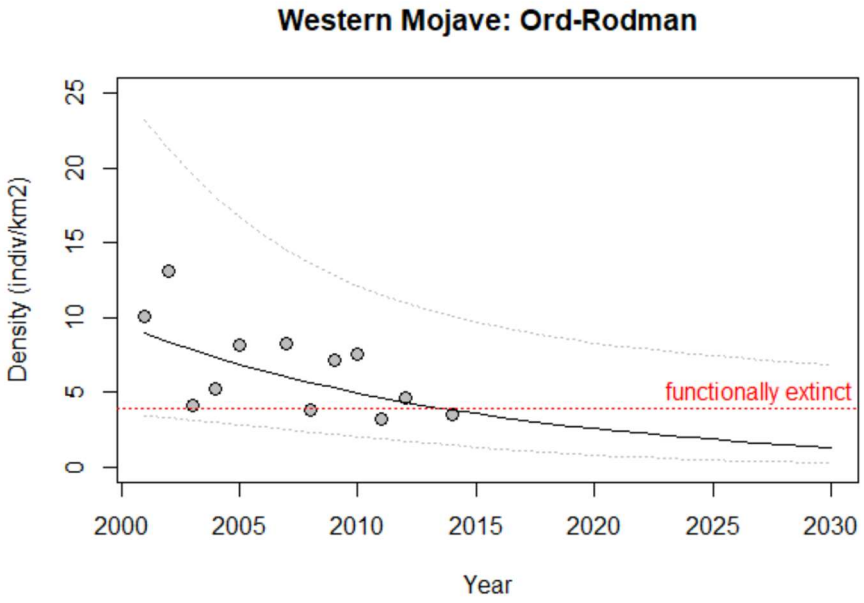
(3/94)

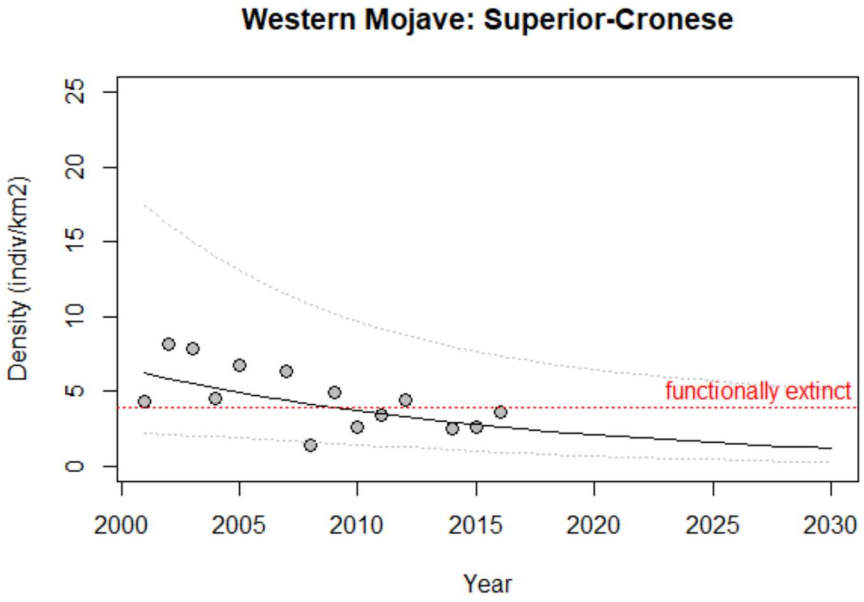
Desert Tortoise Council and Desert Tortoise Preserve Committee believe changing the status of Agassiz's desert tortoise from threatened to endangered under provisions of the California Endangered Species Act will more accurately reflect the status of the species under CESA; result in a higher-level of analysis of impacts from land use activities by CDFW; will result in more effective measures to avoid and minimize incidental take; and will result in higher levels of compensatory mitigation for unavoidable impacts. Combined, these outcomes will contribute to halting the decline of Agassiz's desert tortoise in California and provide conditions conducive to its recovery.

Attachment 1: Graphs of adult desert tortoise populations in Critical Habitat Units (CHU) in California, including minimum viable population density threshold (red dotted line = functionally extinct) and projected extirpation or extinction date. Population data are from USFWS line distance sampling reports.

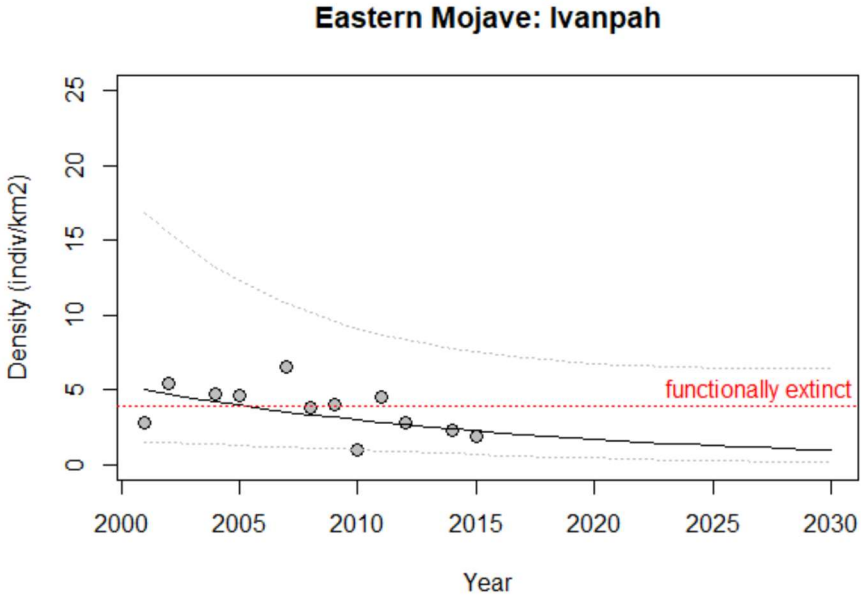
Western Mojave Recovery Unit



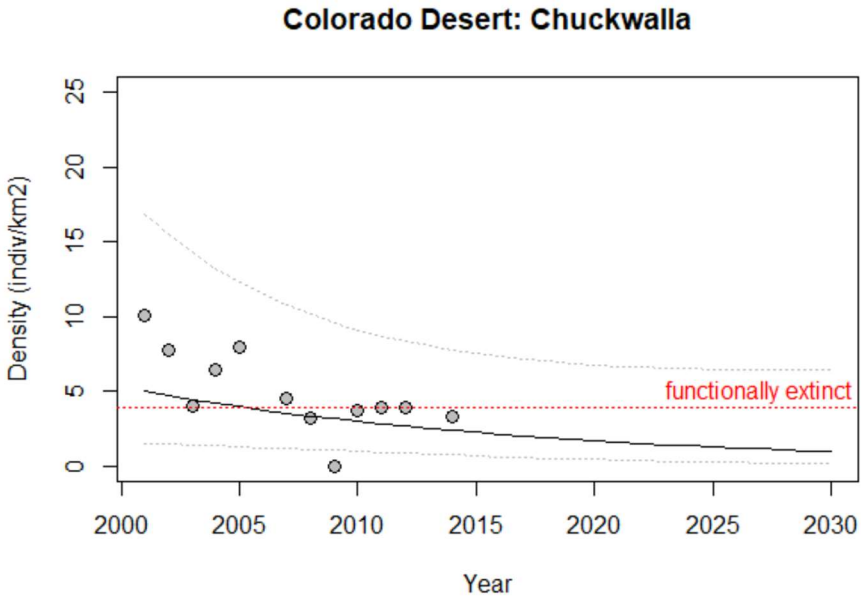


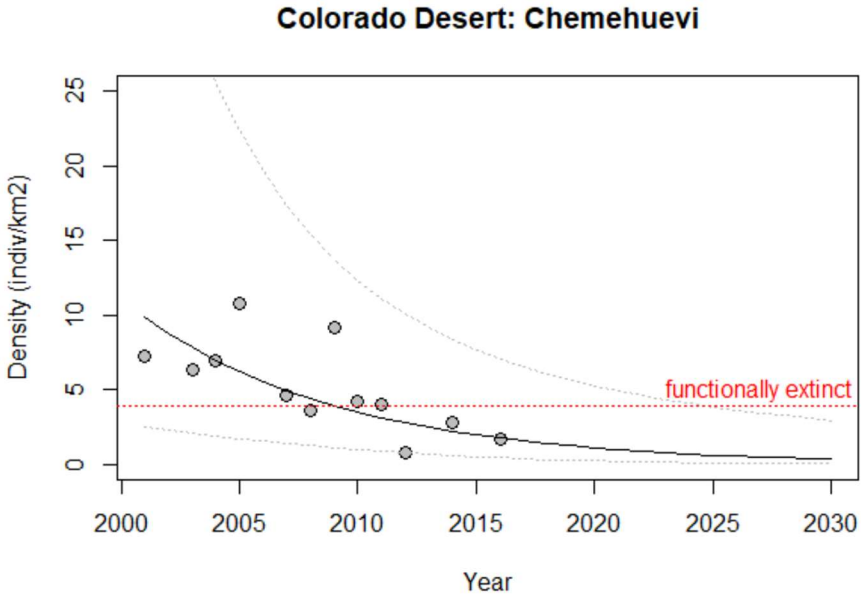


Eastern Mojave Recovery Unit

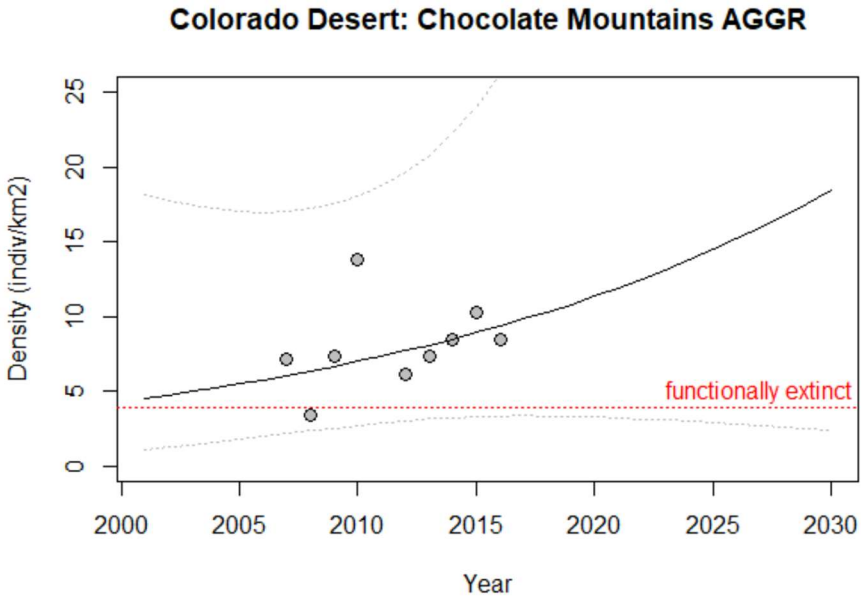


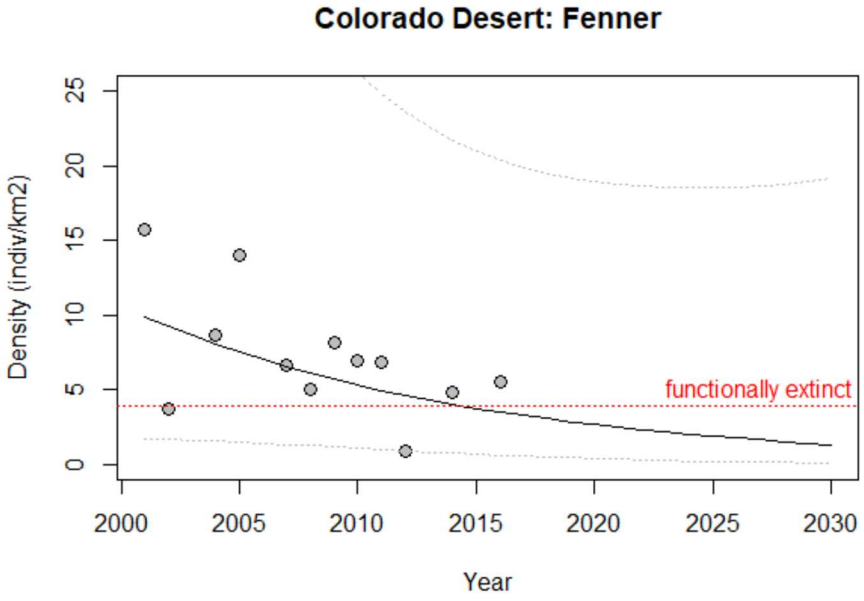
Colorado Desert Recovery Unit



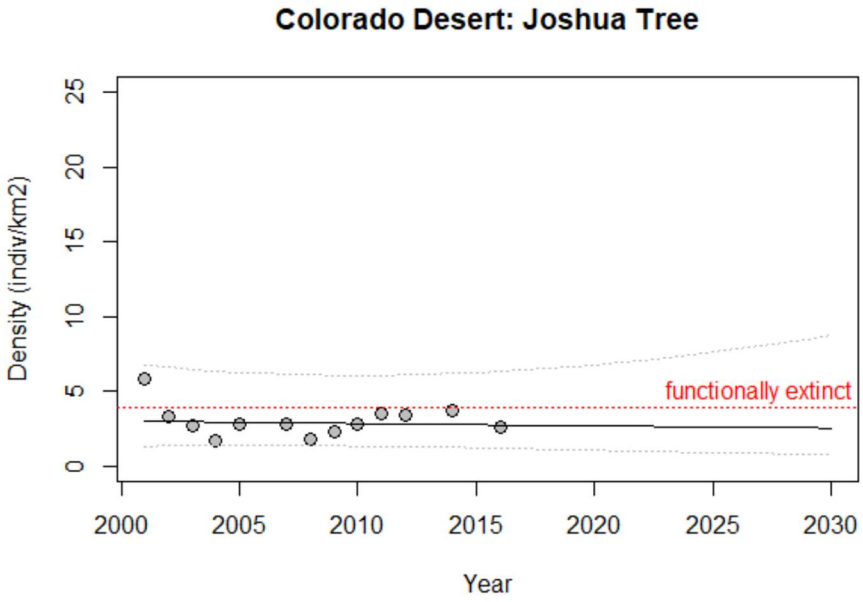


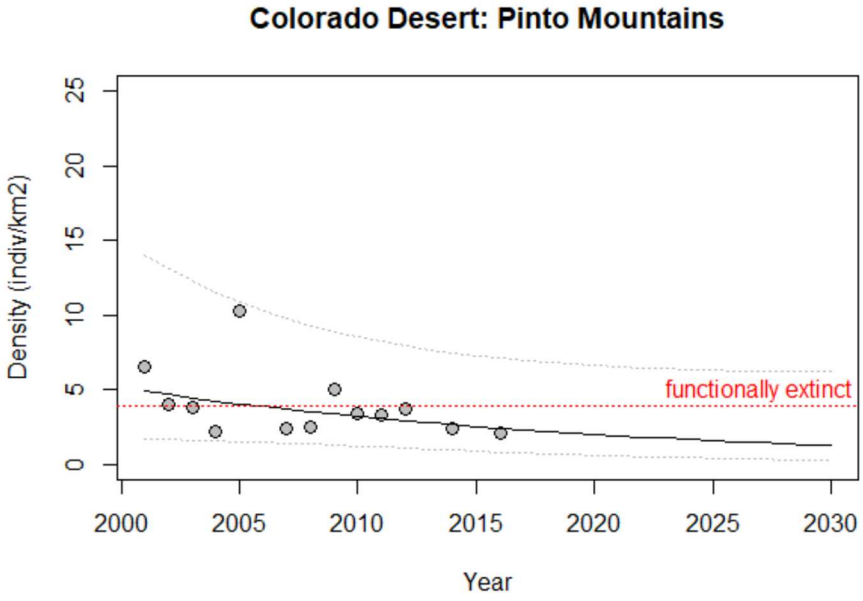
Colorado Desert Recovery Unit (continued)



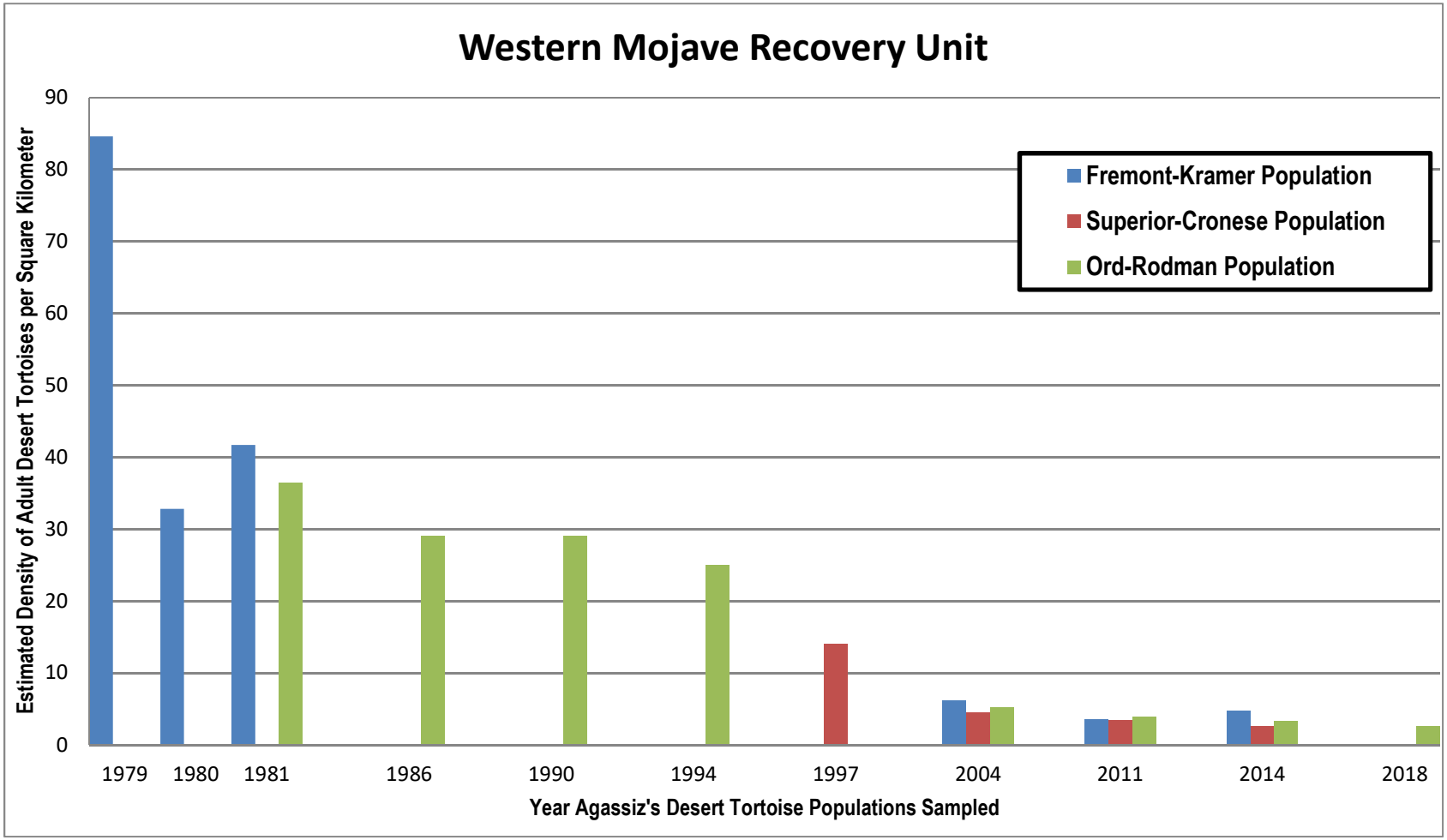


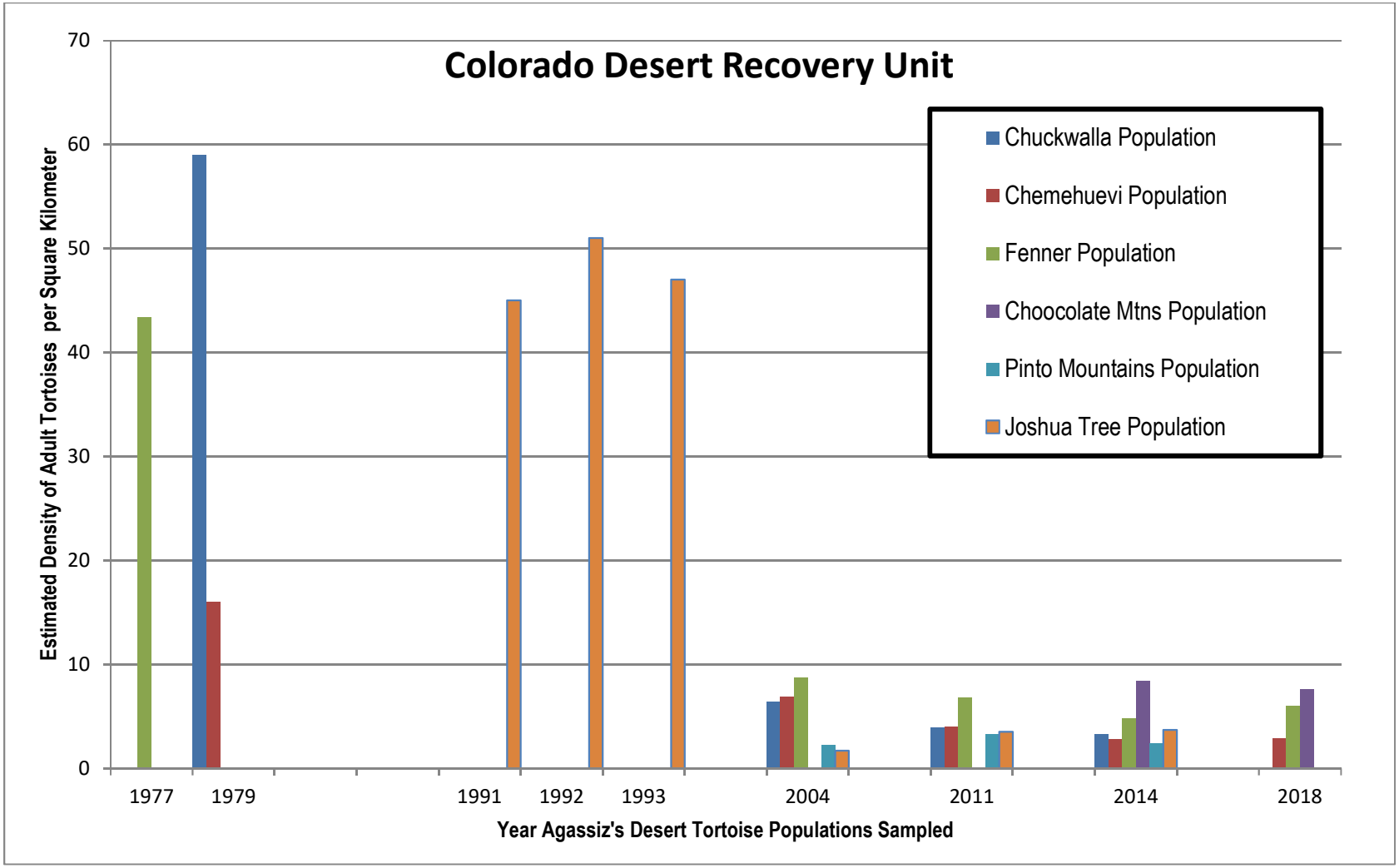
Colorado Desert Recovery Unit (continued)

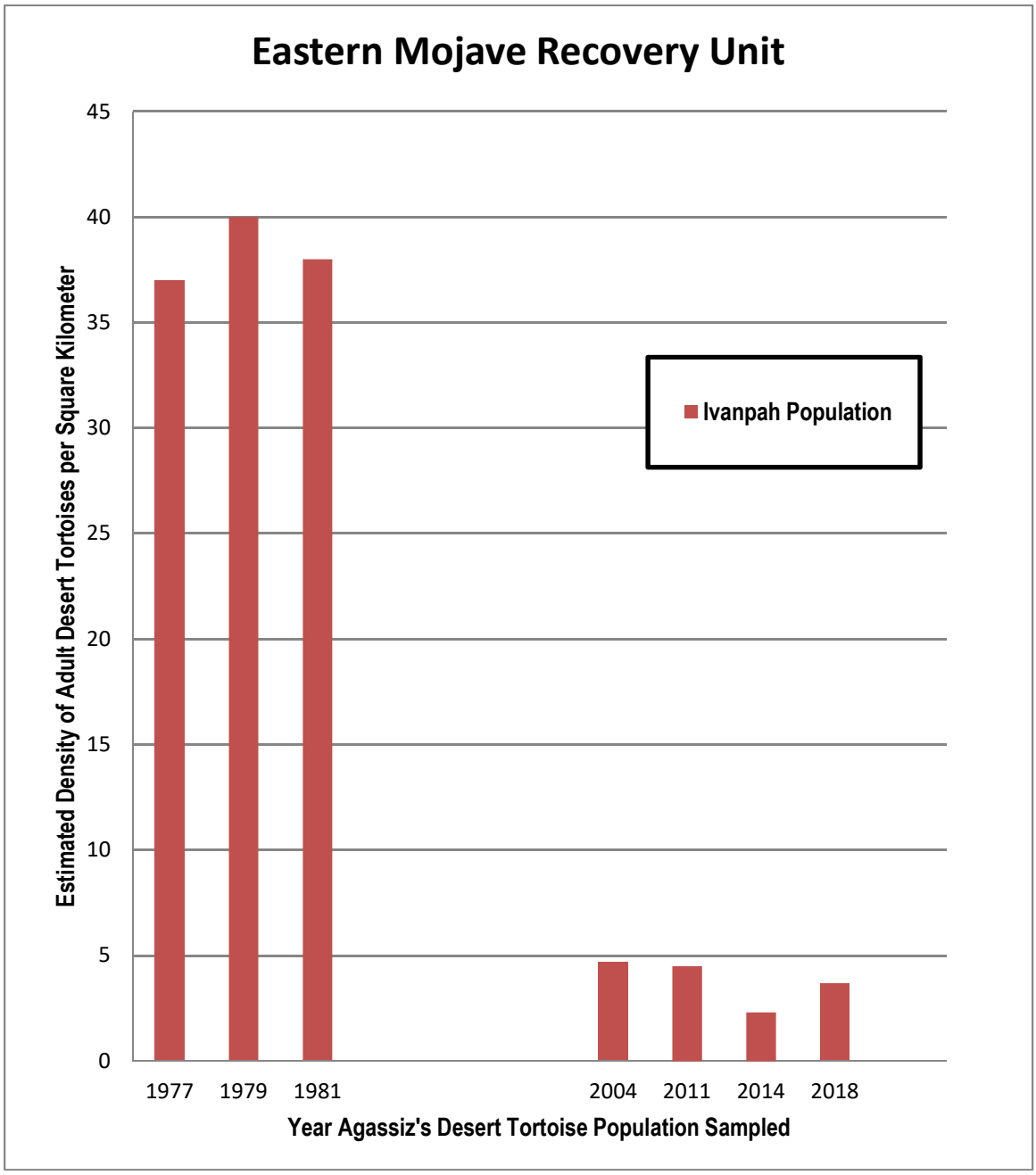




Attachment 2. Density estimates for adult Agassiz's desert tortoises for three Recovery Units (Western Mojave, Colorado Desert, and Eastern Mojave) in California. Data prior to 2001 is from permanent study plots and after 2001 is from line distance sampling.




Colorado Desert Recovery Unit
Estimated Density of Adult Tortoises per Square Kilometer
70
60
50
40
30
20
10
0
1977
1979
1991
1992
1993
2004
2011
2014
2018
Year Agassiz's Desert Tortoise Populations Sampled
Chuckwalla Population
Chemehuevi Population
Fenner Population
Choocolate Mtns Population
Pinto Mountains Population
Joshua Tree Population


Eastern Mojave Recovery Unit
Estimated Density of Adult Desert Tortoises per Square Kilometer
45
40
35
30
25
20
15
10
5
0
Ivanpah Population
1977
1979
1981
2004
2011
2014
2018
Year Agassiz's Desert Tortoise Population Sampled

Attachment 3: Roads, Trails and Disturbance Associated with Motorized Vehicle Use in Selected Desert Tortoise CHUs in the Western Mojave Recovery Unit [1]

The following provides an account of the miles of unpaved roads and trails; and acres of disturbance associated with vehicle camping, parking and stopping areas within desert tortoise CHUs in the Western Mojave Recovery Unit.

Critical Habitat Unit	Roads and Trails Open to Vehicle Use	Roads and Trails Closed to Vehicle Use[i]	Acres of Camping, Parking and Stopping Areas
Fremont-Kramer	897	1397	136
Ord-Rodman	317	488	42
Pinto Mountains	143	66	18
Superior-Cronese	832	765	111
Total	**2,189**	**2,716**	**307**

[i] Note: Although roads and trails are closed to vehicle use, a majority of these routes continue to be subject to unauthorized vehicle use due to the limited ability of law enforcement officers (BLM Rangers, CDFW Wardens, County Sheriffs Deputies) and the extremely high number of vehicle users.

[1] From: Bureau of Land Management. 2019. West Mojave Route Network Project Final Supplemental Environmental Impact Statement (BLM/CA/DOI-BLM-CA-D080-2018-0008-EIS).

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State of California
Department of Fish and Wildlife

Original on file,
received July 23, 2020

Memorandum

Date: July 23, 2020

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: Evaluation of a Petition to Change the Status of Mohave Desert Tortoise from Threatened to Endangered under the California Endangered Species Act

The California Department of Fish and Wildlife (Department) has completed its evaluation of a Petition to change the status of Mohave desert tortoise from threatened to endangered under the California Endangered Species Act, Fish and Game Code section 2050 et seq. The California Fish and Game Commission (Commission) received the Petition from Defenders of Wildlife, The Desert Tortoise Council, and The Desert Tortoise Preserve Committee on March 23, 2020. Pursuant to Fish and Game Code section 2073, the Commission referred the Petition to the Department on April 13, 2020.

The Department completed the attached Petition Evaluation report pursuant to Fish and Game Code section 2073.5. (See also Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1).). The Department's evaluation report delineates the categories of information required in a petition, evaluates the sufficiency of the available scientific information regarding each of the Petition components, and incorporates additional relevant information the Department possessed or received during the review period.

Based upon information contained in the petition and other relevant information in the Department's possession, the Department has determined there is sufficient scientific information available at this time to indicate the petitioned action may be warranted. The Department recommends the Petition be accepted and considered.

If you have any questions or need additional information, please contact Scott Gardner, Wildlife Branch Chief, at Scott.Gardner@wildlife.ca.gov.

Attachment

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State of California
Natural Resources Agency
Department of Fish and Wildlife

REPORT TO THE FISH AND GAME COMMISSION

EVALUATION OF A PETITION FROM THE DESERT TORTOISE COUNCIL, THE DESERT TORTOISE PRESERVE COMMITTEE, AND DEFENDERS OF WILDLIFE TO CHANGE THE STATUS OF MOHAVE DESERT TORTOISE (*GOPHERUS AGASSIZII*) FROM THREATENED TO ENDANGERED UNDER THE CALIFORNIA ENDANGERED SPECIES ACT

Mohave Desert Tortoise (*Gopherus agassizii*) (Photo by BLM)

Prepared by
California Department of Fish and Wildlife

August 2020

INTRODUCTION

Candidacy Evaluation

The Commission has the authority to list certain “species” or “subspecies” as threatened or endangered under CESA. (Fish & G. Code, §§ 2062, 2067, and 2070.) The listing process is the same for species and subspecies. (Fish & G. Code, §§ 2070-2079.1.)

CESA sets forth a two-step process for listing a species as threatened or endangered. First, the Commission determines whether to designate a species as a candidate for listing by evaluating whether the petition provides “sufficient information to indicate that the petitioned action may be warranted.” (Fish & G. Code, § 2074.2, subd. (e)(2).) If the petition is accepted for consideration, the second step requires the Department to produce, within 12 months of the Commission’s acceptance of the petition, a peer reviewed report based upon the best scientific information available that indicates whether the petitioned action is warranted. (Fish & G. Code, § 2074.6.) Finally, the Commission, based on that report and other information in the administrative record, determines whether the petitioned action to list the species as threatened or endangered is warranted. (Fish & G. Code, § 2075.5.)

A petition to list a species under CESA must include “information regarding the population trend, range, distribution, abundance, and life history of a species, the factors affecting the ability of the population to survive and reproduce, the degree and immediacy of the threat, the impact of existing management efforts, suggestions for future management, and the availability and sources of information. The petition shall also include information regarding the kind of habitat necessary for species survival, a detailed distribution map, and any other factors that the petitioner deems relevant.” (Fish & G. Code, § 2072.3; see also Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1).) The range of a species for the Department’s petition evaluation and recommendation is the species’ California range. (*Cal. Forestry Assn. v. Cal. Fish and Game Com.* (2007) 156 Cal.App.4th 1535, 1551.)

Within 10 days of receipt of a petition, the Commission must refer the petition to the Department for evaluation. (Fish & G. Code, § 2073.) The Commission must also publish notice of receipt of the petition in the California Regulatory Notice Register. (Fish & G. Code, § 2073.3.) Within 90 days of receipt of the petition (or 120 days if the Commission grants an extension), the Department must evaluate the petition on its face and in relation to other relevant information and submit to the Commission a written evaluation report with one of the following recommendations:

- Based upon the information contained in the petition, there is not sufficient information to indicate that the petitioned action may be warranted, and the petition should be rejected; or
- Based upon the information contained in the petition, there is sufficient information to indicate that the petitioned action may be warranted, and the petition should be accepted and considered.

(Fish & G. Code, § 2073.5, subds. (a)-(b).) The Department's candidacy recommendation to the Commission is based on an evaluation of whether the petition provides sufficient scientific information relevant to the petition components set forth in Fish and Game Code Section 2072.3 and the California Code of Regulations, Title 14, Section 670.1, subdivision (d)(1).

In *Center for Biological Diversity v. California Fish and Game Commission* (2008) 166 Cal.App.4th 597, the California Court of Appeals addressed the parameters of the Commission's determination of whether a petitioned action should be accepted for consideration pursuant to Fish and Game Code Section 2074.2, subdivision (e), resulting in the species being listed as a candidate species. The court began its discussion by describing the standard for accepting a petition for consideration previously set forth in *Natural Resources Defense Council v. California Fish and Game Commission* (1994) 28 Cal.App.4th 1104:

> As we explained in *Natural Resources Defense Council*, "the term 'sufficient information' in section 2074.2 means that amount of information, when considered with the Department's written report and the comments received, that would lead a reasonable person to conclude the petitioned action may be warranted." The phrase "may be warranted" "is appropriately characterized as a 'substantial possibility that listing could occur.'" "Substantial possibility," in turn, means something more than the one-sided "reasonable possibility" test for an environmental impact report but does not require that listing be more likely than not.

(*Center for Biological Diversity*, *supra*, 166 Cal.App.4th at pp. 609-10 [internal citations omitted].) The court acknowledged that "the Commission is the finder of fact in the first instance in evaluating the information in the record." (*Id.* at p. 611.) However, the court clarified:

> [T]he standard, at this threshold in the listing process, requires only that a substantial possibility of listing could be found by an objective, reasonable person. The Commission is not free to choose between conflicting inferences on subordinate issues and thereafter rely upon those choices in assessing how a reasonable person would view the listing decision. Its decision turns not on rationally based doubt about listing, but on the absence of any substantial possibility that the species could be listed after the requisite review of the status of the species by the Department under [Fish and Game Code] section 2074.6. (*Ibid*.)

CESA defines the "species" eligible for listing to include "species or subspecies" (Fish and G. Code, §§ 2062, 2067, and 2068), and courts have held that the term "species or subspecies" includes "evolutionarily significant units." (*Central Coast Forest Assn. v. Fish & Game Com.* (2018) 18 Cal.App.5th 1191, 1236, *citing Cal. Forestry Assn.*, *supra*, 156 Cal.App.4th at pp. 1542 and 1549.)

Desert Tortoise Taxonomy

Desert tortoises are members of the order Testudines, family Testudinidae, genus *Gopherus*. When the Commission listed desert tortoise in 1989, *Gopherus agassizii* was understood to range from southeastern California, across southern Nevada, through western Arizona, and south into Sonora and Sinaloa, Mexico (Figure 1). Since that time, studies of tortoise genetics, morphometrics, and ecology have led experts to conclude that the complex formerly known as "desert tortoise" in fact consists of two separate species, Mohave desert tortoise and Sonoran desert tortoise (Murphy et al. 2011, Iverson et al. 2017). Mohave desert tortoise, also known as Agassiz's desert tortoise, retains the binomial *G. agassizii*, and ranges across the deserts of southeastern California, southern Nevada, and small areas of Arizona and Utah north of the Colorado River. Desert tortoises south of the Colorado River in Arizona and northern Mexico are now classified as Sonoran desert tortoise, also known as Morafka's desert tortoise, (*Gopherus morafkai*). Only the Mohave (Agassiz's) desert tortoise occurs in California. References to Agassiz's desert tortoise and Mohave desert tortoise in the Petition and this evaluation should be considered synonymous. This evaluation uses the common name Mohave desert tortoise when referring to *G. agassizii* as the species is currently understood.

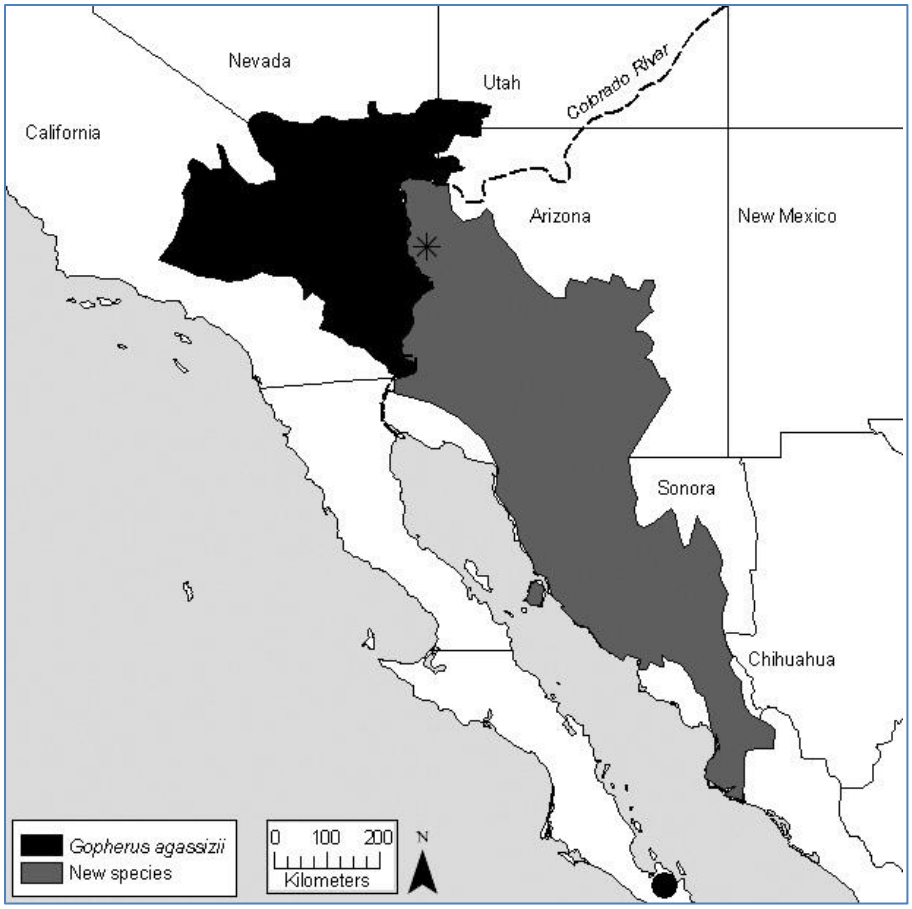

Figure 1. Distribution of Agassiz's or Mohave desert tortoise (*Gopherus agassizii,* black polygon) and Morafka's or Sonoran desert tortoise (*Gopherus morafkai,* gray polygon). Prior to taxonomic revision the two species collectively were considered "desert tortoise" (*G. agassizii*). Figure from Murphy et al. (2011).

Petition History

The desert tortoise was listed as a threatened species by the U.S. Fish and Wildlife Service (USFWS) in 1980 throughout its range which includes southeastern California. In 1989, the Commission listed desert tortoise as a threatened species under CESA. On March 23, 2020, the Commission received a Petition from The Desert Tortoise Council, The Desert Tortoise Preserve Committee, and Defenders of Wildlife to change the status of Mohave desert tortoise from threatened to endangered. On April 13, 2020, the Commission referred the Petition to the Department for evaluation. At its meeting on April 16, 2020, the Commission officially received the Petition.

The Department evaluated the scientific information presented in the Petition as well as other relevant information the Department possessed at the time of review. Pursuant to Fish and Game Code Section 2072.3 and Section 670.1, subdivision (d)(1), of Title 14 of the California Code of Regulations, the Department evaluated whether the Petition included sufficient scientific information regarding each of the following petition components to indicate that the petitioned action may be warranted:

- Population trend;
- Range;
- Distribution;
- Abundance;
- Life history;
- Kind of habitat necessary for survival;
- Factors affecting the ability to survive and reproduce;
- Degree and immediacy of threat;
- Impact of existing management efforts;
- Suggestions for future management;
- Availability and sources of information; and
- A detailed distribution map.

Overview of Mohave Desert Tortoise Ecology

Information in this section is summarized from Berry and Murphy's (2019) recent monograph on the species. The carapaces (shells) of hatchling Mohave desert tortoises average about 44 mm (1.7 in.) long while adult carapaces range in length from 178 to >370 mm (7.0 – 14.5 in.). Females are typically slightly smaller, averaging approximately 220 mm (8.7 in.), while males average about 243 mm (9.6 in.).

In California, the species occupies much of the Mojave Desert and portions of the Sonoran and Great Basin Deserts. It ranges from the southern end of the Owens Valley in the north to the Mexican border near the southeastern corner of the state, and from the Colorado River in the east to the lower slopes of the Sierra Nevada, Tehachapi, San Gabriel, San Bernardino, and Peninsular Mountains in the west (Figure 2).

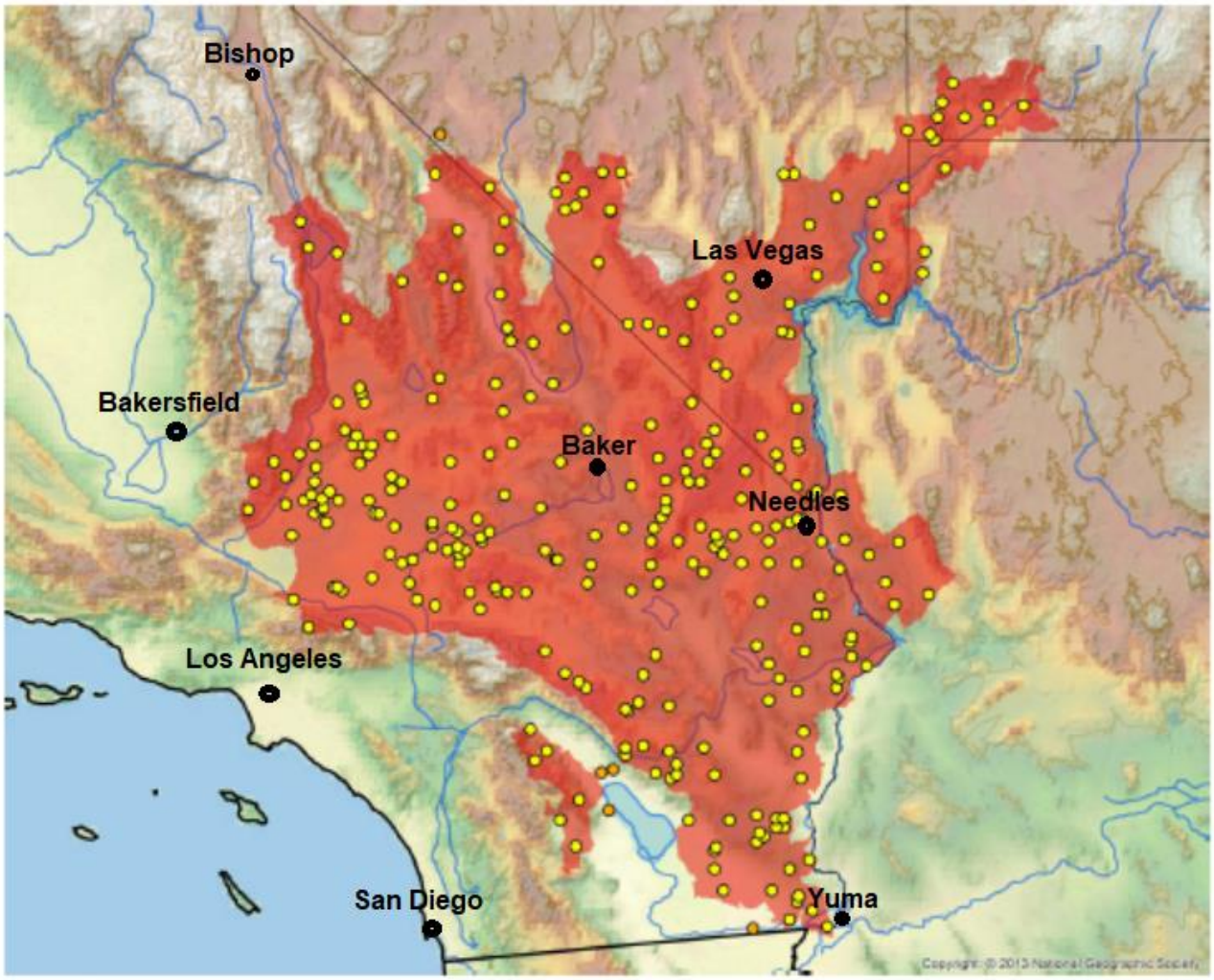

Figure 2. Range and distribution (yellow dots) of Mohave desert tortoise. Figure from Berry and Murphy (2019).

Mohave desert tortoises require topography, geologic features such as rock crevices and the banks of washes, and suitable soils for cover and the construction of burrows and dens. Shrub or tree cover is essential for protection from extreme temperature, precipitation, and predators. Over 70% of burrows occur beneath shrubs, with the larger shrubs or trees preferred. In the lowlands and dry lakebeds of the Mojave Desert ecosystem, tortoises are associated with several vegetation types in the Chenopodiaceae subfamily, including saltbush (*Atriplex* spp.). Most vegetation associations used by desert tortoise contain creosote bush (*Larrea tridentata*), often with white bur-sage (*Ambrosia dumosa*) or cheesebush (*A. salsola*) and several other species of shrubs, cacti, and perennial grasses. At higher elevations tree yuccas (Joshua tree, *Yucca brevifolia,* and Mojave yucca, *Y. schidigera*) and woody shrubs become more common, including blackbrush (*Coleogyne ramosissima*) associations at the highest elevations. The hotter western Sonoran Desert is characterized by creosote bushes, but also includes woodlands of blue palo verde (*Parkinsonia florida*), smoke tree (*Psorothamnus spinosus*), and ironwood (*Olneya tesota*) associated with dry stream channels interspersed with sparse ocotillo (*Fouqueria splendens*), creosote bush, and other shrubs, and cacti. Mohave desert tortoise densities are highest where diverse assemblages of grass, cacti, shrub, and tree cover occur, and low where shrub cover is sparse and precipitation is scarce and erratic. Densities also decline in areas modified by human activities.

Mohave desert tortoises eat annual plants, herbaceous perennials, succulents (cacti), and flowers and leaves of a few perennial shrubs.

Mohave desert tortoises spend >90% of their lives inactive and underground in burrows, pallets (shallow burrows which provide at least partial cover from the sun and predators), caves, or other cover which they can excavate themselves within a few days of hatching. While underground tortoises can reduce their metabolic rates to conserve water and energy. Burrows are often ≥ 3 m (9 ft.) long and ≥ 1 m (3 ft.) below the surface. Denning burrows, which may be used by multiple tortoises, are often found in washes, and may contain side rooms. Underground refuges provide shelter during periods of extreme heat and during droughts and food shortages. Mohave desert tortoise burrows and dens are important landscape features utilized by a wide range of invertebrates, reptiles, birds, and mammals (Henen et al.1998).

Activity patterns, both daily and seasonal, are strongly influenced by temperatures, the timing and amounts of precipitation, availability of free water to drink, and the availability of forage. Tortoises generally emerge from hibernation or brumation (a torpor like state of slowed metabolic activity) in late winter or early spring, followed by above-ground foraging and interactions with other tortoises. By late spring most individuals retreat to burrows, dens, pallets, and rock structures. Tortoises occasionally emerge from cover in early morning or late evening in June and July. From August through late October or early November above ground activity increases until temperatures fall, when individuals retreat underground to hibernate.

Courtship takes place in both the spring and fall, and polyandry (multiple males breeding with the same female) is not uncommon. Females first breed at 12 to 20 years of age and can store sperm and use it to fertilize eggs for several years after mating. Females lay up to three clutches of 1 to 10 eggs in nests within dens, burrows, pallets, and mounds as well as under shrubs. More eggs are laid when forage conditions are favorable. The sex of offspring is determined by the temperature eggs reach during incubation. Warmer conditions result in more females, and colder in more males. Consequently, local populations often have highly skewed sex ratios.

Home ranges of males are generally larger than females. In the central Mojave Desert, Harless et al. (2009) found males had home ranges of 43 to 49 ha (106 to 121 ac.), and females 16 to 17 ha (39.5 to 42 ac.) using minimum convex polygons. Home ranges of juveniles were smaller than those of adults.

Throughout their life stages, Mohave desert tortoises are subject to predation by a wide range of predators. Eggs are consumed by several vertebrate predators, such as Gila monsters (*Heloderma suspectum*), desert kit fox (*Vulpes macrotis*), coyote (*Canis latrans*), American badger (*Taxidea taxus*), and spotted skunks (*Spilogale gracilis*). Hatchlings can be killed by ants, including fire ants (*Solenopsis* spp.), common ravens (*Corvus corax*), bobcats (*Lynx rufus*), desert kit fox, rodents, and burrowing owls (*Athene cunicularia*). Adults are known to be preyed upon by common ravens, golden eagles (*Aquila chrysaetos*), coyotes, bobcats, mountain lions (*Puma concolor*), American badgers, and domestic dogs (*Canis lupus familiaris*).

SUFFICIENCY OF SCIENTIFIC INFORMATION TO INDICATE THE PETITIONED ACTION FOR MOHAVE DESERT TORTOISE MAY BE WARRANTED

The Petition components are evaluated below, pursuant to Fish and Game Code Section 2072.3 and Section 670.1, subdivision (d)(1), of Title 14 of the California Code of Regulations.

Population Trend

Scientific Information in the Petition

The Petition discusses population trends on pages 7to 21 under the heading "Population Trends".

The Petition relies upon analyses of long-term Mohave desert tortoise monitoring projects to characterize the population trend of the species. The Petition presents (see Petition Tables 1a. and 1b.) results from a long-term, fixed plot intensive search monitoring project conducted by the U.S. Bureau of Land Management (BLM) in the late 1970s and later surveyed by the U.S. Geologic Survey (Figure 3). These data illustrate a general pattern of decline in adult Mohave desert tortoise population density estimates in the Desert Tortoise Recovery Units (RUs), Critical Habitat Units (CHUs), Conservation Areas (CAs) and Wildlife Management Areas (WMAs) sampled 1977 to 2000; with a few exceptions such as the Joshua Tree Unit where populations appear to have increased or remained stable. Berry (2003) analyzed the results of these periodic intensive search surveys and found declines of 50% to 96% in adult tortoise densities between the late 1970s and early 2000s. In the Desert Tortoise Research Natural Area within the Western Mojave Recovery Unit, from 1982 to 1992 the overall Mohave desert tortoise population declined by 86%, with the adult population declining by about 94%, primarily due to Mycoplasmosis disease mortality (Brown et al. 1999).

Population estimates of permanent study plots in the Colorado Desert Recovery Unit at Chemehuevi Valley and Chuckwalla Bench showed population declines as high as 90% from the early 1990s to the 2000s (BLM and CDFG 2002). Surveys performed in 2000 showed all tortoise size classes in sampled eastern Mojave Desert Critical Habitat Units declined from previous tortoise population estimates, some by 76% to 80%. Larger tortoise size classes were estimated to have declined by as much as 90% from previous estimates (Berry 2000, BLM 2002).

Beginning in 2001, at the direction of the interagency Desert Tortoise Management Oversight Group, the long-term monitoring strategy was changed to line-distance sampling on randomly established plots to determine density estimates. Petition Table 3 presents the Mohave desert tortoise density estimates derived from annual line-distance sampling surveys by year from 2001 to 2019. Density estimates trend lower across all units except for the Ivanpah CHU, where the trend is less apparent. The USFWS (2015) analyzed density estimate data from 2004 to 2014 and found declines of 30 to 65% over the decade across the units except for the Joshua Tree sampling unit where the density estimate increased by 178%. Despite the dramatic increase in the Joshua Tree sampling unit, the overall density estimate for the larger Colorado Desert Recovery Unit, which contains Joshua Tree and five other sampling units, declined by more than 36% (USFWS 2015).

The 1994 Recovery Plan for the Mojave Population of the Desert Tortoise (USFWS 1994) determined that the minimum viable tortoise population density is 3.9 adults per square kilometer, or approximately 10 per square mile. The density estimates in nine of the 10 California Mohave desert tortoise sampling units were below the minimum viable density in 2014 (USFWS 2015).

Taken together, the two long-term monitoring projects indicate the Mohave desert tortoise population declined substantially in most sampling units from 1977 to 2000, and then substantially declined further from 2001 to 2014. The most recent estimates indicate the population densities in most sampling units are below the minimum density determined necessary to sustain populations.

Other Relevant Scientific Information

The USFWS Range-Wide Monitoring of the Mohave Desert Tortoise 2019 Annual Report (USFWS 2020) indicates that density estimates in eight of the nine reported sampling units remain below the minimum viable density of 3.9 adults per square kilometer.

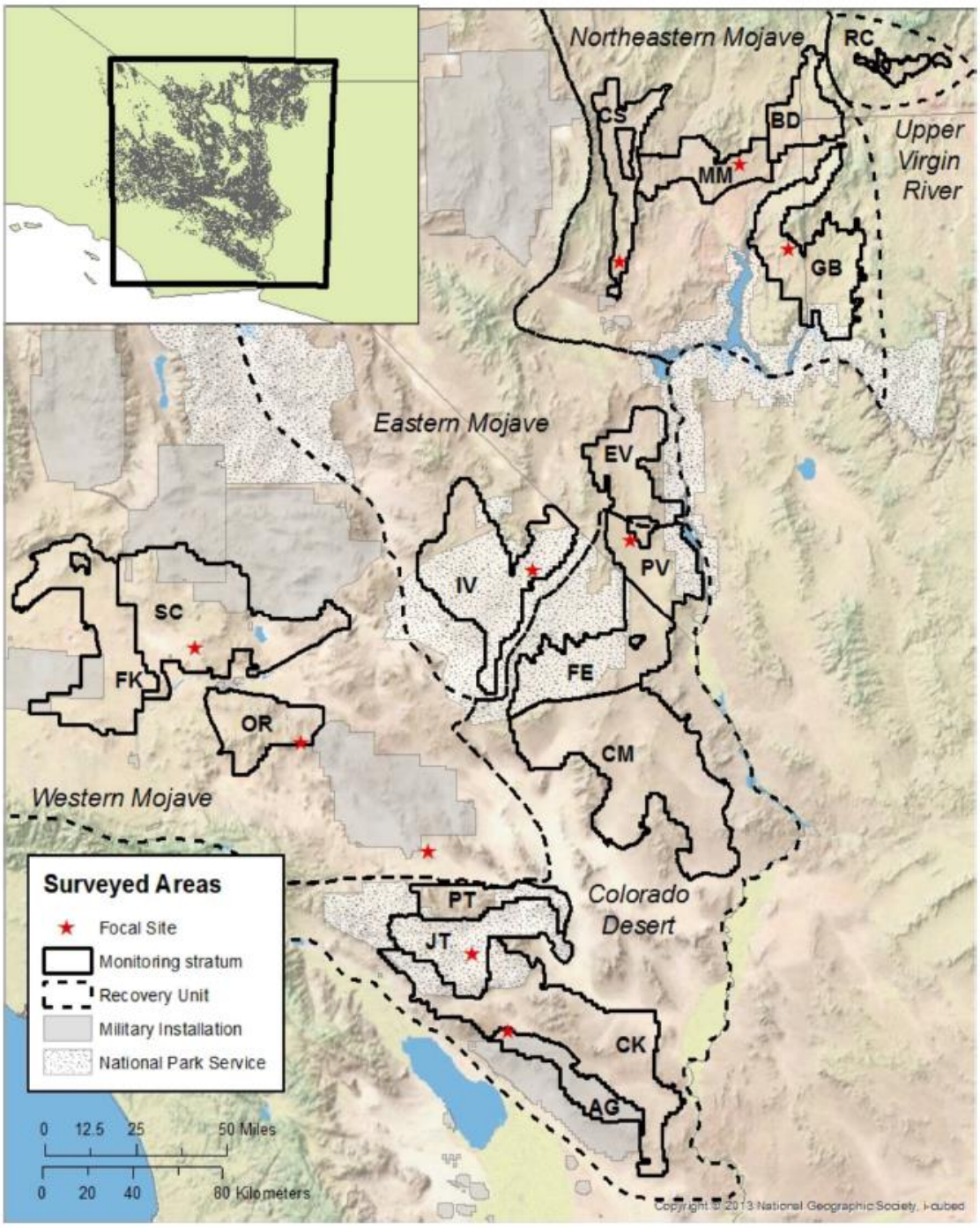

Figure 3. Mohave desert tortoise Recovery Units (dashed lines) and Critical Habitat Units (solid lines, shown as “Monitoring stratum” in legend). FK = Fremont-Kramer, SC = Superior-Cronese, OR = Ord-Rodman, PT = Pinto Mountains, JT = Joshua Tree, CK = Chuckwalla, AG = Chocolate Mtns, Aerial Gunnery Range, CM = Chemehuevi, FE = Fenner, IV = Ivanpah. This figure appears as Figure 1 in the Petition. Figure source is USFWS (2020).

Conclusion

While the Petition did not include a Mohave desert tortoise population estimate it presented observed population density data that indicate populations have dramatically declined over the last 40 years. Population census data is lacking for most wildlife species and the use of density estimates as a surrogate for tracking trends in population size is a commonly accepted practice (e.g. Anderson et al. 1979). The information in the Petition is sufficient to indicate the Mohave desert tortoise population in California has declined substantially from historical levels and has continued to trend downward since the species was listed as a threatened species by the Commission in 1989.

Geographic Range and Distribution

Scientific Information in the Petition

The Petition discusses geographic range and distribution on pages 21 to 25.

The Petition provided information on changes in Mohave desert tortoise distribution associated with the expansion of two military installations: Fort Irwin in 2002, and the U.S. Marine Corps Air Ground Combat Center in 2013. This information indicates changes in the distribution of Mohave desert tortoises may have occurred, but it does not inform trends in the historical or current geographic range.

Other Relevant Scientific Information

The Mohave desert tortoise is distributed through the Mojave Desert and portions of the Sonoran and Great Basin Deserts from the southern end of the Owens Valley in the north to the Mexican border near the southeastern corner of the state, and from the Colorado River in the east to the lower slopes of the Sierra Nevada, transverse, and Peninsular Mountains in the west (Berry and Murphy 2019). Grinnell and Camp (1917) produced an early desert tortoise distribution map based on museum records available at the time (Figure 4), and Patterson (1981), produced the first map of desert tortoise distribution derived from available literature and museum records as well as the observation of herpetologist (Figure 5). These early distribution maps show the same general pattern of distribution and range as contemporary maps such as Berry and Murphy (2019, see Figure 2). Accordingly, The USFWS (2019) concluded the species' distribution has not changed substantially in terms of the overall extent of its range, although desert tortoises have been removed from portions of their range for solar developments, military activities, and other development projects.

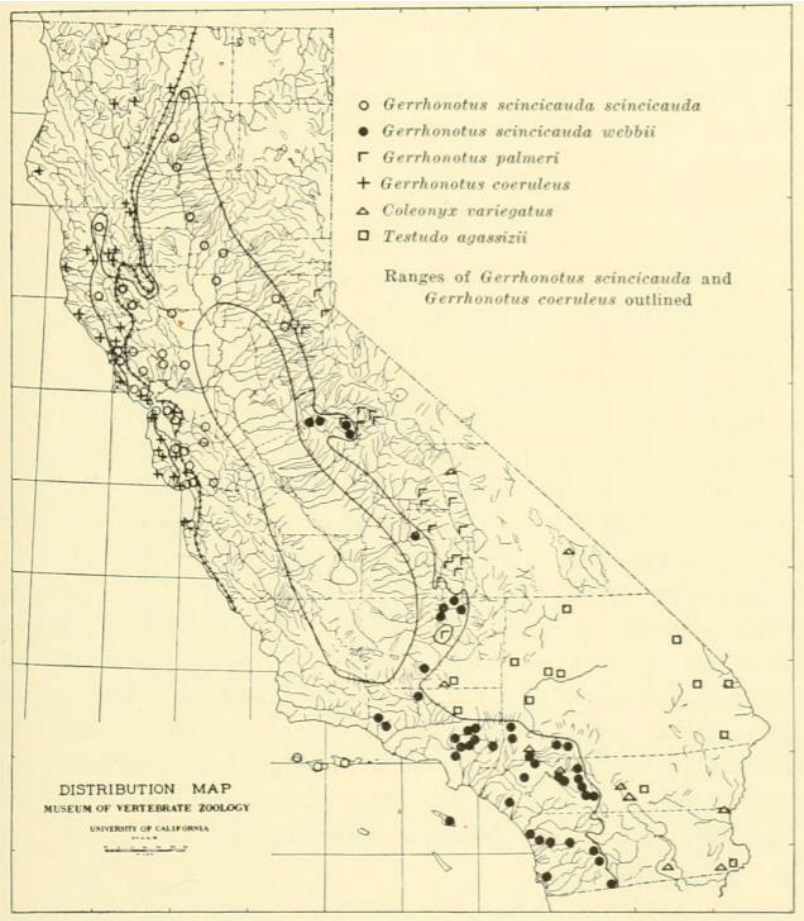

Figure 4. Distribution of desert tortoise records (open squares) from Grinnell and Camp (1917).

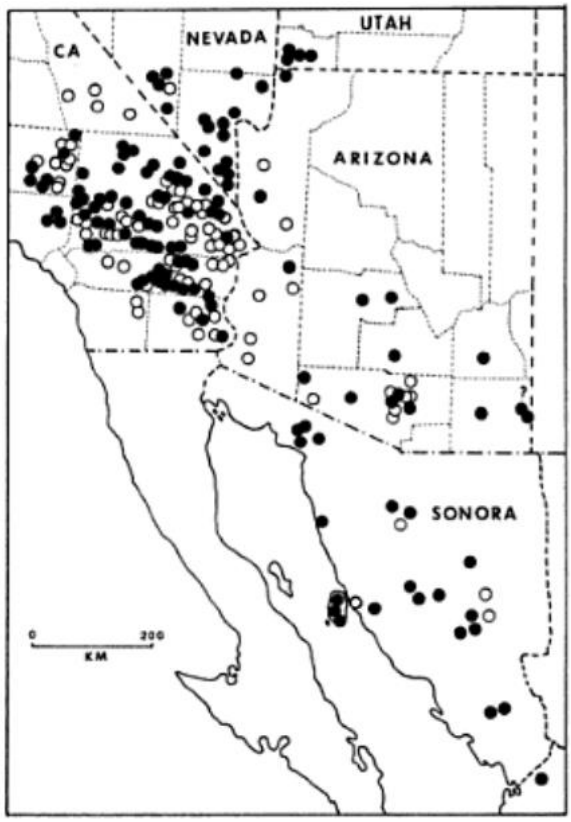

Figure 5. Distribution of desert tortoises from Patterson (1981). Black dots represent museum and literature records, open circles represent observations of professional and amateur herpetologists. Note that records outside of California include tortoises now ascribed to Morafka's desert tortoise and Goode's thornscrub tortoise (*Gopherus evgoodei*).

Conclusion

Information available to the Department indicates that the Mohave desert tortoise range has not changed substantially since it was first documented in the early 1900s. The Petition provides sufficient information to indicate changes in its distribution within the range have occurred in recent years.

Abundance

Scientific Information in the Petition

The Petition discusses the abundance of Mohave desert tortoises on pages 25 to 29.

The Petition restates information presented in the Population Trend section of the Petition, emphasizing that density estimates of adult Mohave desert tortoises in Critical Habitat Units declined by 51.3% from 2004 to 2014 (USFWS 2015); and that density estimates in the Western Mojave Recovery Unit appear to have declined by 85% to 95% since the earliest density information was collected in the late 1970s (USFWS 1994, 2015). The Petition restates that Mohave desert tortoise densities in eight of 10 sampling units are below the estimated minimum viable population density described in the Recovery Plan (USFWS 1994).

Conclusion

The Petition provides sufficient information to indicate substantial reductions in Mohave desert tortoise abundance have occurred in large areas of their range. Additionally, the Petition demonstrates that the abundance of Mohave desert tortoises has continued to decline since the species was listed as threatened in California in 1989.

Life History

Scientific Information in the Petition

The Petition discusses the life history of the Mohave desert tortoise on pages 29 to 31.

The Petition provides a brief overview of the species' physical description, behavior, adaptations to the desert environment, reproductive biology, home range, and genetic diversity within California.

Conclusion

The Petition provides sufficient information on the life history of the Mohave desert tortoise.

Kind of Habitat Necessary for Survival

Scientific Information in the Petition

The Petition discusses Mohave desert tortoise habitat requirements on pages 31 to 33.

The Petition states the required elements of Mohave desert tortoise habitat include sufficient suitable quantity and quality of plants for forage and cover, suitable substrates for burrow and nest sites, and low occurrence of predators. Most such habitat is found on flats and bajadas with soils ranging from sand to sandy gravel, and scattered shrubs with abundant inter-shrub space for growth of herbaceous plants; although tortoises are also found on rocky terrain and slopes in the Mojave region. Where Mohave desert tortoises occur in the Mojave Desert annual precipitation ranges from 10 to 21 cm (3.9 – 7.9 in.) (Germano et al. 1994). Other important requisites of Mohave desert tortoise habitat listed in the Petition include sufficient space for viable populations and protection from disturbance and human activity (USFWS 1994). The Petition describes the vegetation communities used by Mohave desert tortoises by Desert Tortoise Recovery Unit:

- Colorado Desert Recovery Unit
  - Succulent Scrub (*Fouquieria, Opuntia, Yucca*)
  - Blue Palo Verde-Smoke Tree Woodland
  - Creosote Bush Scrub
  - Blue Palo Verde-Ironwood-Smoke Tree Woodland
- Eastern Mojave Recovery Unit
  - Big Galleta-Scrub Steppe
  - Succulent Scrub (*Yucca, Opuntia* spp.)
  - Creosote Bush Scrub
  - Cheesebush Scrub
  - Indian Rice Grass (*Oryzopsis hymenoides*) Scrub-Steppe
- Western Mojave Recovery Unit
  - Saltbush-Allscale (*Atriplex polycarpa*) Scrub
  - Indian Rice Grass Scrub-Steppe
  - Hopsage (*Grayia spinosa*) Scrub
  - Big Galleta Scrub Steppe
  - Cheesebush Scrub
  - Desert Psammophytes
  - Blackbush (*Coleogyne ramosissima*) Scrub

Conclusion

The Petition presents sufficient information on the habitat requirements of the Mohave desert tortoise.

Factors Affecting the Ability to Survive and Reproduce

Scientific Information in the Petition

The Petition discusses factors affecting the ability of Mohave desert tortoise to survive and reproduce on pages 33 to 35. Other information related to threats is discussed in the Population Trend, Geographic Range, Abundance, and Kind of Habitat Necessary for Survival sections.

Petition Figure 2 graphically displays the relationships between the various factors that threaten the ability of Mohave desert tortoises to survive and reproduce. Threats listed include land uses (ranching, mining, agriculture, urbanization, military operations, transportation networks, recreation, and utility corridors), and weather impacts (storms, drought, availability of natural water). These factors work through various pathways to cause mortality, either directly or indirectly, through starvation, predation, habitat loss, dehydration, drowning, crushing, burial, disease, and other mechanisms.

The Petition also presents information on the threat of artificially high predation pressure from subsidized predators (predator populations maintained at artificially high levels due to obtaining some of their food resources for humans or land use changes associated with humans) such as ravens and coyotes, diseases, and effects associated with climate change. Identified climate change impacts included increasing summer high temperatures, more frequent and prolonged drought, decreasing annual precipitation and associated changes in vegetation communities, and decreased availability of nutritious forage plants and shrub cover.

Conclusion

The Petition provides sufficient information regarding the factors affecting the ability of Mohave desert tortoises to survive and reproduce.

Degree and Immediacy of Threat

Scientific Information in the Petition

The Petition generally discusses threats to Mohave desert tortoises on page 36. Additional information on threats affecting desert tortoises is included throughout the Petition, including information on: disease, drought, and predation impacts (p.15); urbanization (p. 22); off-highway vehicle impacts (OHVs, pp. 22, 26, 41); invasive species (p. 22); threats associated with military bases and military training (p. 22); renewable energy facilities (p. 24); roads (pp. 24, 32); human presence and subsidized predators (pp. 26, 27); impacts associated with climate change (pp. 27, 28, 34); grazing (p. 32); and translocations (p. 38).

Conclusion

The Petition provides sufficient information on the threats affecting the Mohave desert tortoise.

Impact of Existing Management Efforts

Scientific Information in the Petition

The Petition discusses the impact of existing management efforts on Mohave desert tortoise populations on pages 36 to 43.

The Petition describes the property ownership pattern of land designated Desert Tortoise Critical Habitat by the USFWS (1994). USFWS designed critical habitat covers 19,239 km2 (4,754,000 ac.) in California. The major landowners, in descending area of ownership, are BLM, private lands, U.S. National Park Service (NPS), U.S. Department of Defense (DOD), and the State of California.

Current land use on BLM lands in the Mohave desert tortoise range is governed by a series of Regional Plans. BLM lands are managed under a multiple use mandate which includes grazing, utility rights of way, off road vehicle recreation, wildlife habitat management, and wilderness and wild and scenic river areas. In recent years, BLM has received numerous applications for renewable energy development projects, totaling tens of thousands of acres. In response to these applications BLM–with support from USFWS, California Energy Commission, and the Department–enacted the Desert Renewable Energy Conservation Plan (DRECP) across 91,054 km^2 (approximately 22.5 million ac.) of southeastern California deserts, a landscape-scale plan for siting renewable energy facilities and preserving environmentally sensitive areas. The siting of these facilities could result in the removal or degradation of up to 4,569 ha (11,290 ac.) of Mohave desert tortoise habitat in the plan area, including 1,916 ha (4,734 ac.) of critical habitat (USFWS 2016). The BLM is currently considering amending the DRECP in response to Executive Order 13783 which directs federal agencies to review regulations that unnecessarily impede energy development (Fed. Reg. 83(23):4921-4922).

NPS lands in the Mohave desert tortoise range include the Mojave National Preserve and Joshua Tree National Park. NPS General Management Plans emphasize the protection of natural and cultural resources.

DOD lands in the Mohave desert tortoise range include China Lake Naval Air Weapons Station, Edwards Air Force Base, Fort Irwin (U.S. Army), Marine Corps Air Ground Combat Center, and the Chocolate Mountains Gunnery Range (U.S. Navy and U.S. Marine Corps). These lands are managed under Integrated Natural Resource Management Plans. Use of the lands includes weapons development, mechanized training, and weapons fire. These uses can result in the loss and fragmentation of habitat but use of the China Lake Naval Air Weapons Station and Edwards Air Force Base largely occurs in air space, with relatively little impact to Mohave desert tortoise habitat.

Private lands in the Mohave desert tortoise range are primarily used for residential and commercial development, agriculture, mining, and open space. Land use practices are governed by city and county general plans.

Conclusion

The Petition describes land ownership and includes a cursory discussion of land management practices by ownership within designated Mohave desert tortoise Critical Habitat Units. However, it does not provide similar information for the species' entire range in California which encompasses an area far greater than the Critical Habitat Units. Nonetheless, the Petition provided sufficient information on the general patterns of land ownership and land management practices in the species' range.

Suggestions for Future Management

Scientific Information in the Petition

The Petition provides suggestions for future management of Mohave desert tortoises on pages 43 to 47, which are summarized below.

- Increase protections for Mohave desert tortoise in BLM Areas of Critical Environmental Concern using the measures proven effective in Desert Tortoise Reserve Natural Areas.
- Implement science-based monitoring of the extent and impact of OHV and grazing uses of BLM lands.
- Amend the California Desert Conservation Plan (BLM 1980) to reduce OHV and grazing uses on BLM lands, and to enforce protective measures.
- State and Federal management agencies should be actively engaged in planning and implementing recovery actions.
- Control ravens in desert tortoise Recovery Units.
- Meet the recovery goals of the USFWS Recovery Plan (1994).

Conclusion

The Petition provides sufficient information regarding suggestions for future management of Mohave desert tortoise and its habitat.

Detailed Distribution Map

Scientific Information in the Petition

The Petition provides links to three websites containing Mohave desert tortoise distribution maps on page 48.

Conclusion

The range maps linked in the Petition are sufficient.

Sources and Availability of Information

Scientific Information in the Petition

The Petition cites an extensive list of sources in Appendix 4.

Other Relevant Scientific Information

The Department used additional sources of scientific information cited in this Petition Evaluation.

Conclusion

The Petition provides sufficient information on the sources and availability of information used in the Petition.

RECOMMENDATION TO THE COMMISSION

Pursuant to Section 2073.5 of the Fish and Game Code, the Department has evaluated the Petition on its face and in relation to other relevant information the Department possesses or received. In completing its Petition Evaluation, the Department has determined that the Petition and other relevant information indicates there is sufficient scientific information to indicate that the petitioned action to change the status of Mohave desert tortoise from threatened to endangered may be warranted. Therefore, the Department recommends the Commission accept the Petition for further consideration under CESA.

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CESA Petition Evaluation:
Mohave Desert Tortoise (*Gopherus agassizii)*

California Fish and Game Commission

October 14, 2020

Daniel Applebee – Wildlife Branch

Outline

- Conservation status
- Petition evaluation process
- Species overview
- Petition evaluation
- Department recommendation

Mohave Desert Tortoise
Conservation Status

- **CESA: Threatened (1989)**
  - Petition to list as Endangered (2020)
- **ESA: Threatened (1990)**
  - *5-Year Review (2010)*
- **Threats Identified:**
  - *Habitat Loss*
  - *Disease*

Petition Evaluation Process

1. Population trend
2. Range
3. Distribution
4. Abundance
5. Life history
6. Habitat
7. Survival and reproduction factors
8. Degree/immediacy of threat
9. Impacts of existing management
10. Suggestions for future management
11. Information sources
12. Detailed distribution map

Species Overview: Taxonomy

- **Order Testudines,**
- **Family Testudinae**

- **Two Species in U.S.:**
  - Mohave/Agassiz's desert tortoise (*G. agassizii)*
  - Morafka's tortoise (*G. morafkai*)

Species Overview: Geographic Range

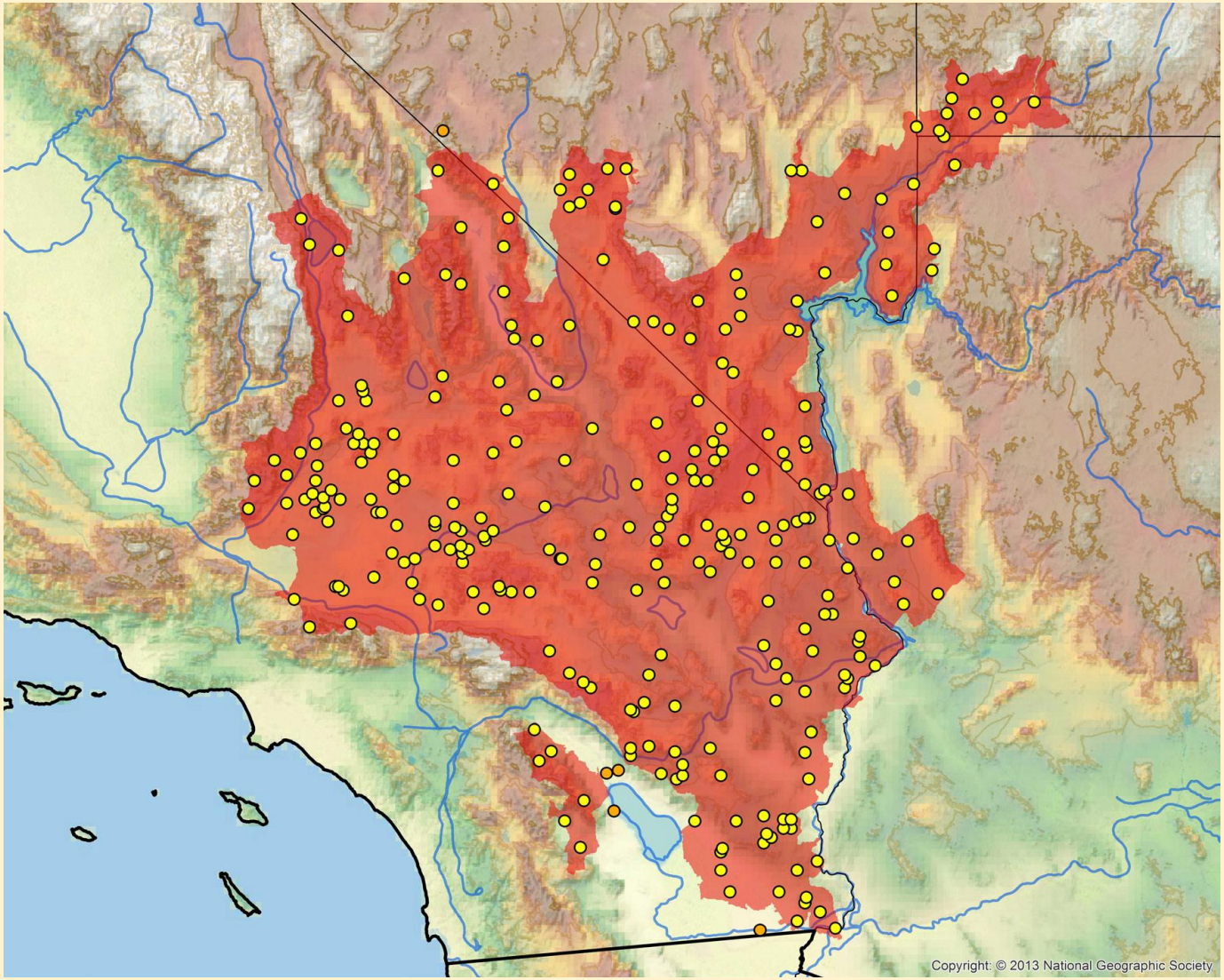


Figure from Berry and Murphy. 2019.

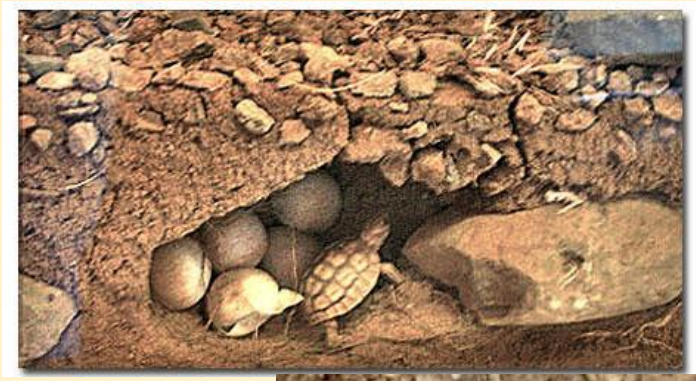
Species Overview: Habitat

- Suitable soils and structure for shelter and burrows

- Shrub cover for shade and foraging

Species Overview: Life History

- Seasonally active
- Long lifespans
- Slow to reach maturity
- Low reproductive rate
- Diet includes wide variety of plants and shrubs

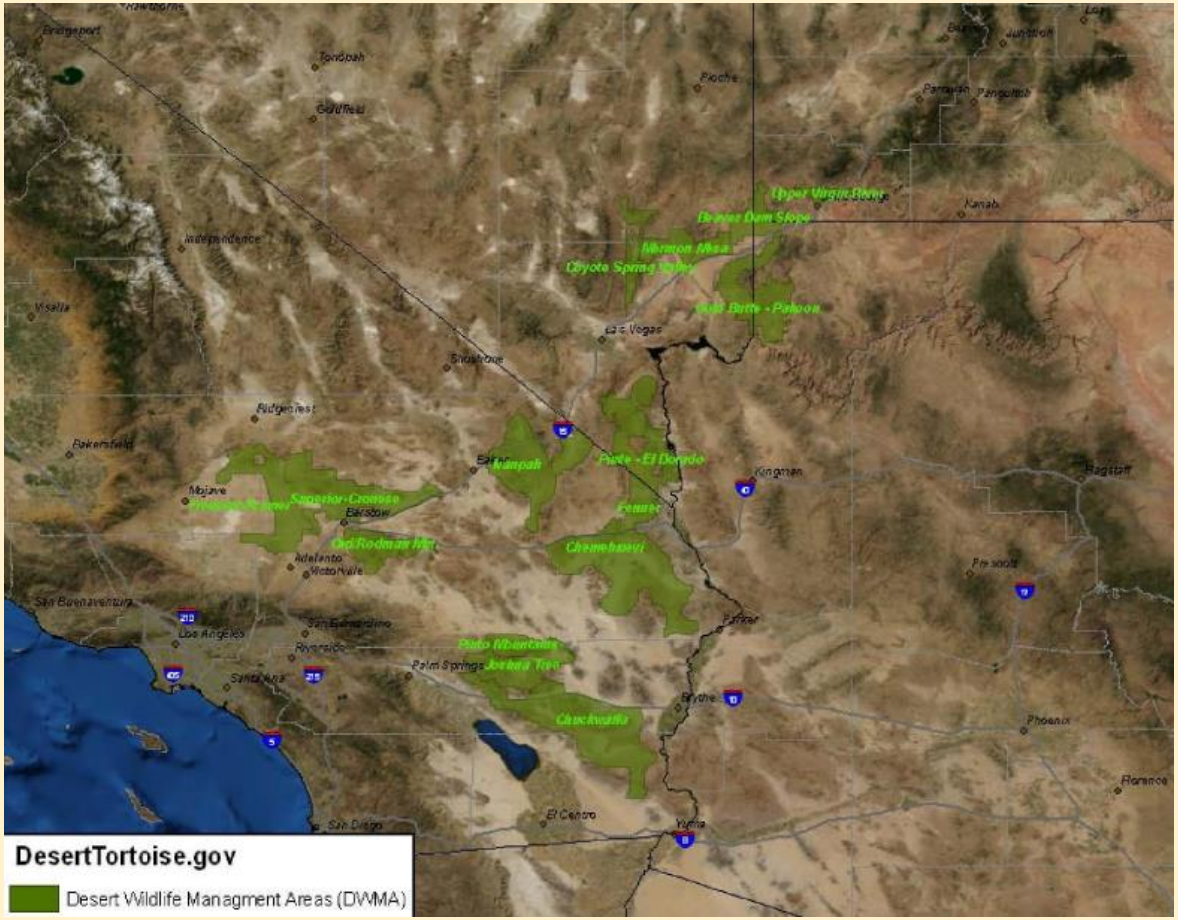


Petition Evaluation

1. Population trend
2. Range
3. Distribution
4. Abundance
5. Life history
6. Habitat
7. Survival and reproduction factors
8. Degree/immediacy of threat
9. Impacts of existing management
10. Suggestions for future management
11. Information sources
12. Detailed distribution map

Petition Evaluation: Population Trend

Abundant long-term population density monitoring data available from regular surveys of Desert Tortoise Wildlife Management Areas beginning in late 1970s.



Petition Evaluation: Population Trend

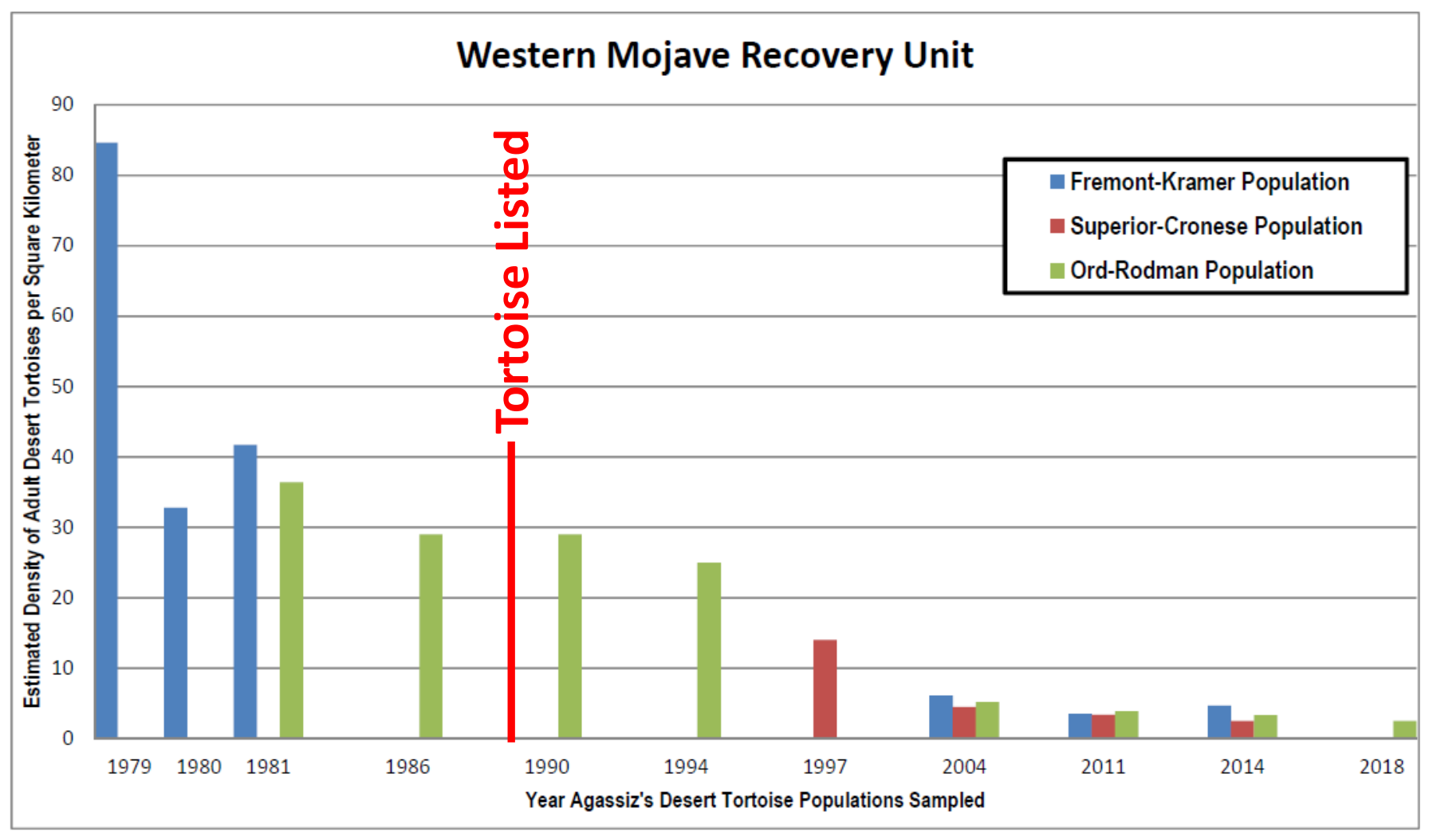
Petition Information:

Population density data for 10 California Desert Tortoise Management Units

- Dramatic declines late 1970s – present
- Declines of up to 50% to 96% in most units
- Declines continued since listed under CESA and ESA

Many Management Units may be below presumed minimum viable population densities

Petition Evaluation: Population Trend Example



Petition Evaluation: Threats

Main threats identified:

- Habitat loss and degradation
- Disturbance
- Artificially high predation rates
- Disease
- Climate change

Petition Evaluation: Existing Management

Petition Information:

- BLM Lands - Multiple Use Mandate
- Department of Defense - Training
- Private Lands - Development and Resource Use
- Translocations

Petition Evaluation: Suggestions for Management

Petition Information:

- Increase protections in BLM Areas of Critical Ecological Concern
- Reduce OHV and grazing impacts and enforce regulations
- Develop recovery plans and implement recovery actions.

Department Recommendation

- The Department has determined the Petition presents sufficient scientific information that the petitioned action to change status from Threatened to Endangered may be warranted.

- The Department recommends the Commission accept the Petition for further consideration under CESA.

Thank You

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California Fish and Game Commission
Potential Agenda Items for December 2020 Commission Meeting

The next Commission meeting is scheduled for December 9-10, 2020. Due to ongoing health concerns related to COVID-19 and state travel restrictions, the meeting will be held by webinar/teleconference. 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 (Department).

Wednesday, December 9: Marine-related and administrative items

1. General public comment for items not on the agenda
2. Executive director's report
3. Receive Department informational items (marine)
4. Tribal Committee
5. Marine Resources Committee
6. Adopt: amend recreational fishing regulations for the take of red and purple sea urchin in Tanker Reef, Monterey County, and the take of purple sea urchin in Caspar Cove, Mendocino County
7. Adopt: amend recreational fishing regulations for the take of red abalone sunset date
8. Adopt: recreational crab marine life protection measures regulations
9. Annual recreational ocean salmon and Pacific halibut regulations: Update on the Pacific Fishery Management Council process and timeline, and automatic conformance to federal regulations
10. Receive annual report on Department Statewide Marine Protected Areas Program management activities
11. Marine items of interest from previous meetings
12. Action on marine petitions for regulation change
13. Action on marine non-regulatory requests from previous meetings
14. Executive (closed) session

Thursday, December 10: Wildlife- and inland fisheries-related and administrative items

15. General public comment for items not on the agenda
16. Receive Department informational items (wildlife and inland fisheries)
17. Wildlife Resources Committee
18. Receive the Department's five-year status review for California bighorn sheep (also known as Sierra Nevada bighorn sheep) under CESA
19. Receive the Department's five-year status review for Owens tui chub under CESA
20. Receive the Department's 90-day evaluation report for the petition to list Quino checkerspot butterfly as a threatened or endangered species under CESA
21. Determine whether the petitioned action to list upper Klamath Trinity river spring Chinook salmon as a threatened or endangered species under CESA is warranted
22. Notice: amend Klamath River Basin sport fishing regulations (annual)

23. Notice: amend Central Valley sport fishing regulations (annual)
24. Notice: amend waterfowl hunting regulations (annual)
25. Notice: amend mammal hunting regulations to adjust deer and antelope tags and big game license tag drawing
26. Wildlife and inland fisheries items of interest from previous meetings
27. Action on wildlife and inland fisheries petitions for regulation change
28. Action on wildlife and inland fisheries non-regulatory requests from previous meetings
29. Administrative items (next meeting agenda, rulemaking timetable, new business)

State of California
Department of Fish and Wildlife

M e m o r a n d u m

Date: October 6, 2020 (Received by FGC on Oct 6, 2020)

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham (Signed original on file)
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 change to the Fish and Game Commission's (Commission's) 2020 regulatory timetable:

- Add a rulemaking to add Section 708.19 Preference Point Reinstatement and Tag Fee Refund and amend sections 360 Deer and 363 Pronghorn Antelope, Title 14, CCR. The rulemaking to add Section 708.19 is necessary to reinstate elk and pronghorn antelope preference points and partially refund fees paid to hunters who were unable to use their drawn tags in 2020 due to fire-related forest closures. The amendments to sections 360, and 363 will adjust deer and pronghorn antelope tag quotas in areas where CDFW long-term datasets indicate population declines.
    - The proposed meeting schedule is notice at the December 2020 meeting.

- Add a rulemaking to amend Section 632, Marine Protected Areas, Marine Managed Areas, and Special Closures, Title 14, CCR, to allow for maintenance of pre-existing artificial structures within State Marine Conservation Areas. This rulemaking is necessary to allow for permitted maintenance and/or repair needs of structures that were installed prior to Marine Protected Area designation by the Commission. This rulemaking is a priority to address in the near-term due to immediate maintenance and repair needs for select structures that need to be permitted prior to an emergency or threat to public health and safety.
    - The proposed meeting schedule is notice at the February 2021 meeting, discussion at the April 2021, and adoption at the June 2021 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.

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California Fish and Game Commission: Perpetual Timetable for Anticipated Regulatory Actions

Updated October 7, 2020

Items proposed for change are shown in blue underlined font

Regulatory Change Category	Title 14 Section(s)	FGC Webinar/Teleconference Oct 14, 2020	TC Webinar/Teleconference Nov 9, 2020	MRC Webinar/Teleconference Nov 10, 2020	FGC Webinar/Teleconference Dec 9, 2020	FGC Webinar/Teleconference Dec 10, 2020	FGC Webinar/Teleconference Jan 12, 2021	WRC Webinar/Teleconference Jan 12, 2021	FGC Webinar/Teleconference Feb 10, 2021	FGC Webinar/Teleconference Feb 11, 2021	MRC Webinar/Teleconference Mar16, 2021	TC Webinar/Teleconference Apr 13, 2021	FGC Webinar/Teleconference Apr 14, 2021	FGC Webinar/Teleconference Apr 15, 2021	FGC Webinar/Teleconference May 11, 2021	WRC Webinar/Teleconference May 11, 2021	FGC Webinar/Teleconference Jun 16, 2021	FGC Webinar/Teleconference Jun 17, 2021	MRC Sacramento Jul 20, 2021	TC Sacramento Aug 17, 2021	FGC Sacramento Aug 18, 2021	FGC Sacramento Aug 19, 2021	WRC Sacramento Sep 16, 2021
Central Valley Sport Fishing (Annual)	7.50(b)(4), (43), (66), (80)					N			D				D		A					E 8/1			
Klamath River Basin Sport Fishing (Annual)	7.40(b)(50)					N			D				D		A					E 8/1			
Waterfowl (Annual)	502					N			D				A						E 7/1				
Mammal Hunting - Deer and Antelope tag adjustments, and big game license tag drawing	360, 363, 708.19					N	D		A				E 4/1										
Marine Protected Areas (MPAs), Marine Managed Areas (MMAs), and Special Closures	632									N				D				A					
Commercial Pacific Herrintg Eggs on Kelp (Fishery Management Plan Implementation)	163, 164				E 11/30																		
Groundfish	27.30, 27.35, 27.45, 28.27, 28.28, 28.54, 28.55, 28.65, 150.16	A						E 1/1															
Simplification of Statewide Inland Fishing Regulations [3]	3.00, 4.00, 5.00, 5.41, 5.84, 5.86, 5.89, 7.00, 7.40, 7.50, 8.10	A									E 3/1												
Recreational Crab Marine Life Protection Measures	29.80, 29.85 701	D			A						E 3/1												
Recreational Take of Red Abalone	29.15	D			A								E 4/1										
Recreational take of Sea Urchin at Caspar Cove and Tanker Reef regulations [5]	29.06	D			A							E 3/1											
Recreational Purple Sea Urchin emergency regulations (120 day extension)	29.06								EE 1/12														

Rulemaking Schedule to be Determined	Title 14 Section(s)	FGC Webinar/Teleconference Oct 14, 2020	TC Webinar/Teleconference Nov 9, 2020	MRC Webinar/Teleconference Nov 10, 2020	FGC Webinar/Teleconference Dec 9, 2020	FGC Webinar/Teleconference Dec 10, 2020	FGC Webinar/Teleconference Jan 12, 2021	WRC Webinar/Teleconference Jan 12, 2021	FGC Webinar/Teleconference Feb 10, 2021	FGC Webinar/Teleconference Feb 11, 2021	MRC Webinar/Teleconference Mar16, 2021	TC Webinar/Teleconference Apr 13, 2021	FGC Webinar/Teleconference Apr 14, 2021	FGC Webinar/Teleconference Apr 15, 2021	FGC Webinar/Teleconference May 11, 2021	WRC Webinar/Teleconference May 11, 2021	FGC Webinar/Teleconference Jun 16, 2021	FGC Webinar/Teleconference Jun 17, 2021	MRC Sacramento Jul 20, 2021	TC Sacramento Aug 17, 2021	FGC Sacramento Aug 18, 2021	FGC Sacramento Aug 19, 2021	WRC Sacramento Sep 16, 2021
CA Grunnion (FGC Petition #2019-014)	TBD																						
~~Mammal Hunting~~	~~TBD~~																						
Commercial Kelp and Algae Harvest Management	165, 165.5, 705																						
Santa Cruz Harbor Salmon Fishing (FGC Petition #2016-018)	TBD																						
European Green Crab (FGC Petition #2017-006)	TBD																						
Wildlife Areas/Public Lands [4]	TBD																						
Experimental Fishing Permit (EFP) Program Phase II)	TBD																						
Possess Game / Process Into Food	TBD																						
American Zoological Association / Zoo and Aquarium Association	671.1																						
Night Hunting in Gray Wolf Range (FGC Petition #2015-010)	474																						
Shellfish Aquaculture Best Management Practices	TBD																						
Ban of Neonicotinoid Pesticides on Department Lands (FGC Petition #2017-008)	TBD																						
Commercial Pink Shrimp Trawl	120, 120.1, 120.2																						
Ridgeback Prawn Incidental Take Allowance	120(e)																						

FGC = California Fish and Game Commission MRC = FGC Marine Resources Committee WRC = FGC Wildlife Resources Committee TC = FGC Tribal Committee
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
3 = Includes FGC Petition #2018-008 4 = Includes FGC Petition #2018-003 5 = Includes FGC Petition #2020-001

STAFF SUMMARY FOR OCTOBER 14, 2020

19C. 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 14, 2020

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 California Fish and Game Code. FGC will address four 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, at the time the agenda was made public.

In the writ proceeding brought by Aaron Lance Newman, the trial court entered a ruling (Exhibit A1). In the proceeding, Mr. Newman challenged FGC's decision to revoke his hunting and sport fishing privileges. The court has vacated FGC's decision without prejudice due to a perceived procedural problem.

(B) ***Possible litigation involving FGC***

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

(C) ***Staffing***

For details about staffing, see the executive director's report under Agenda Item 3 for today's meeting.

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

I. *Silva appeal*: Consider the appeal filed by Robert Silva in Agency Case No. 20ALJ06-FGC regarding his request to renew his lobster operator permit. On Apr 29, 2020, DFW provided Mr. Silva notice denying his request to reinstate a lobster operator permit (Exhibit D1). On Jun 4, 2020, Mr. Silva filed an appeal with FGC (Exhibit D2). On Oct 2, 2020, DFW submitted a letter to FGC stating that DFW does not oppose granting the appeal (exhibits D3 and D4). Given that DFW submitted a statement indicating it does not oppose the relief requested in the

SUPERIOR COURT OF CALIFORNIA

COUNTY OF SACRAMENTO

DATE/TIME JUDGE	September 18, 2020 HON. SHELLEYANNE W. L. CHANG	DEPT. NO CLERK	21 E. HIGGINBOTHAM
AARON LANCE NEWMAN, Petitioner, v. CALIFORNIA FISH AND GAME COMMISSION, and DOES 1 through 50, Respondents.		Case No.: 34-2018-80002944	
Nature of Proceedings:	RULING ON SUBMITTED MATTER RE: MOTION FOR SUMMARY JUDGMENT		

This matter came on for hearing on September 15, 2020. Having considered the filings and arguments of the parties, the Court now rules as set forth herein. For ease of review, the Court has restated its tentative ruling, but rules as stated in its "final ruling" section.

A. TENTATIVE RULING

I. DISCUSSION

A. Evidentiary Objections

Respondent has filed evidentiary objections to the declarations submitted in support of the motion for summary judgment. Respondent has failed to comply with California Rule of Court Rule 3.1354's requirement that each objection be numbered consecutively. The Court will refer to the objections as though they had been properly numbered. Objections 1, 8, 9, 10, and 11 are **SUSTAINED**. Objections 2-7 are moot, and objections 12 and 13 are **OVERRULED**.

B. Procedural Objection

Respondent argues this motion is procedurally deficient because Respondent has not yet made a general appearance in this matter, and is not required to file a responsive pleading until after the administrative record is lodged. Code of Civil Procedure section 437c(a)(1) provides,

> A party may move for summary judgment in an action or proceeding if it is contended that the action has no merit or that there is no defense to the action or proceeding. The motion may be made at any time after 60 days have elapsed

since the general appearance in the action or proceeding of each party against whom the motion is directed or at any earlier time after the general appearance that the court, with or without notice and upon good cause shown, may direct.

Petitioner argues this argument is without merit because Petitioner's motion is based on the fact that Respondent "has not and cannot provide a court reporter transcript of electronic record of the Administrative hearing and such a record is a vital aspect of the necessary Administrative Record and a matter of due process right." (Reply, p. 1.) Petitioner argues Respondent has acknowledged that this argument *is* procedurally ripe for a motion for summary judgment and cites to Respondent's opposition which states, "...except for the challenge based on the unavailability of the reporter's transcript, which arose after the hearing, summary judgment is not available..." (Oppo., p. 10.)

While the Court agrees with Respondent that Petitioner's remaining arguments concerning the validity of the underlying administrative decision are not properly raised prior to Respondent's general appearance, the Court finds Petitioner is entitled at this time to raise argument concerning the unavailability of a complete administrative record.

C. <u>The missing transcript</u>

The parties agree that the following facts are undisputed. On July 3, 2018, Respondent revoked Petitioner's hunting and fishing privileges, which decision was rendered after a hearing conducted by an administrative law judge. The reporter's transcript for the administrative hearing is now "unavailable" as the court reporter has failed to produce the transcript for the hearing.

The question before the Court for purposes of the instant motion is whether Petitioner's due process rights have been violated because there is no reporter's transcript contained within the administrative record. Title 14 of the California Code of Regulations contains the provisions applicable to Respondent. Section 746 concerns the procedures for license or permit revocations, and provides,

> "...the commission...shall comply with the following minimum safeguards to afford each applicant, licensee or permittee procedural and substantive due process when the commission considers revocation, suspension, transfer, reinstatement or waiver of renewal requirements for a license or permit including hunting and sport fishing license or permit privileges.
>
> (a) In the case where the applicant, licensee or permittee has already been convicted of a violation of the Fish and Game Code or any regulation pertaining to the activity licensed or permitted by said code, the commission shall comply with the following:
>
> ...
>
> (4) The proceedings of the hearing *shall be recorded by a court reporter* or an electronic tape recording system.

> (12) The applicant, licensee or permittee may request judicial review by filing a petition for writ of mandate in accordance with provisions of the Code of Civil Procedure within 30 days from the date of service (postmark) of the order. *The record of the proceedings as designated by the petitioner shall be prepared by the commission and delivered to petitioner's counsel* or, if appearing pro se, the petitioner within 30 days after petitioner's request and upon payment of the fee specified in Section 69950 of the Government Code. (Emphasis added.)

Petitioner argues the failure of Respondent to provide a copy of the court reporter's transcript, even if such a failure is due to circumstances beyond Respondent's control, is a clear violation of section 746(a)(4) and is a violation of Petitioner's right to due process. Respondent argues the absence of the transcript is due to a "rogue reporter" and that the transcript is not necessary because Respondent was not "statutorily required to rely on the transcript because it adopted the proposed decision in its entirety." (Oppo., p. 22.)

These arguments turn on statutory interpretation and construction. The interpretation of statutes is an issue of law on which the court exercises its independent judgment. (See, *Sacks v. City of Oakland* (2010) 190 Cal.App.4th 1070, 1082.) In exercising its independent judgment, the Court is guided by certain established principles of statutory construction, which may be summarized as follows. The primary task of the court in interpreting a statute is to ascertain and effectuate the intent of the Legislature. (See, *Hsu v. Abbara* (1995) 9 Cal.4th 863, 871.) This extends to a challenge that a regulation exceeds the agency's authority, although the Court gives great weight to the agency's interpretation. (*Nick v. City of Lake Forest* (2014) 232 Cal.App.4th 871.)

The starting point for the task of interpretation is the words of the statute itself, because they generally provide the most reliable indicator of legislative intent. (See, *Murphy v. Kenneth Cole Productions* (2007) 40 Cal.4th 1094, 1103.) The language used in a statute is to be interpreted in accordance with its usual, ordinary meaning, and if there is no ambiguity in the statute, the plain meaning prevails. (See, *People v. Snook* (1997) 16 Cal.4th 1210, 1215.) The court should give meaning to every word of a statute if possible, avoiding constructions that render any words surplus or a nullity. (See, *Reno v. Baird* (1998) 18 Cal.4th 640, 658.) Statutes should be interpreted so as to give each word some operative effect. (See, *Imperial Merchant Services, Inc. v. Hunt* (2009) 47 Cal.4th 381, 390.)

Beyond that, the Court must consider particular statutory language in the context of the entire statutory scheme in which it appears, construing words in context, keeping in mind the nature and obvious purpose of the statute where the language appears, and harmonizing the various parts of the statutory enactment by considering particular clauses or sections in the context of the whole. (See, *People v. Whaley* (2008) 160 Cal.App.4th 779, 793.)

Section 746(a)(4) does not have any language to suggest that a transcript or recording is only required if the Commission fails to adopt the ALJ's proposed decision in its entirety, as Respondent suggests. The plain language provides that the hearing "*shall be recorded*" and in this case Respondent acknowledges that no such recording has ever been produced and will not

ever be produced. Further, subdivision (a)(12) provides that the record of proceedings "as designated by the petitioner *shall be prepared by the commission*" and here, Petitioner is being deprived of the ability to include the reporter's transcript as part of the record of proceedings because such a transcript does not exist. While the Court acknowledges that the failure to produce a transcript does not appear to be Respondent's "fault," such a fact does not change the fact that compliance with subdivision (a)(4) and (a)(12) did not and cannot occur. Accordingly, pursuant to section 746, Respondent failed to provide the "minimum safeguards" to afford Petitioner substantive due process.

II. CONCLUSION

Petitioner's requested remedy is that the Order of Decision be "vacated with prejudice." However, such a remedy is inappropriate. Respondent argues the appropriate remedy would be to "reconstruct the missing record or remand for a new hearing if that is not possible." (Oppo., p. 23)(citing *Chavez. v. Civil Service Com.* (1978) 86 Cal.App.3d 324, 332.) The Court finds that Petitioner's requested remedy is inappropriate for the circumstances. The motion for summary judgment is **GRANTED** and the Order of Decision is **VACATED WITHOUT PREJUDICE**. Going forward, the parties are free to avail themselves of the remedies articulated in *Chavez*. A judgment shall be issued in favor of Petitioner, and against Respondent, and a peremptory writ shall issue commanding Respondent to take action specially enjoined by law in accordance with the Court's ruling, but nothing in the writ shall limit or control in any way the discretion legally vested in Respondents. Respondent shall make and file a return within 60 days after issuance of the writ, setting forth what has been done to comply therewith.

B. FINAL RULING

At the hearing on this matter, Respondent reiterated that it has not yet made a general appearance in this matter, and as such, the motion for summary judgment is procedurally defective. The Court notes that Respondent did not file its opposition to the motion as part of a "special appearance" and did not note that counsel was making a "special appearance" as part of oral argument on this motion. While Respondent filed a procedural objection to the motion, Respondent also opposed the motion on the merits. In addition, on February 18, 2020, counsel for Respondent signed a stipulation to continue the hearing on the motion for summary judgment, which continuance the Court subsequently ordered. Lastly, Respondent opposed the ex parte application for a stay order on the merits of the application.

Pursuant to Code of Civil Procedure section 1014,

> A defendant appears in an action when the defendant answers, demurs, files a notice of motion to strike, files a notice of motion to transfer pursuant to Section 396b, moves for reclassification pursuant to Section 403.040, gives the plaintiff written notice of appearance, or when an attorney gives notice of appearance for the defendant.

"[I]t is the general rule that if an appearance is for any purpose other than to question the jurisdiction of the court, it is general." (*Pfeiffer v. Ash* (1949) 92 Cal.App.2d 102, 104.) If a party

appears and "objected only to the consideration of the case, or to any procedure on it, because the court has not acquired jurisdiction of the person of the defendant, the appearance is special...On the other hand, if he appears and asks for any relief which could only be given to a party in a pending case, or which itself would be a regular proceeding in the case, it is a general appearance..." (*Milstein v. Ogden* (1948) 84 Cal.App.2d 229, 232.) "The list of acts constituting an appearance set forth in Code of Civil Procedure section 1014...is not exclusive. Instead, the determining factor is whether defendant takes a part in the particular action which in some manner recognizes the authority of the court to proceed." (*Sierra Club v. Napa County Bd. of Supervisors* (2012) 205 Cal.App.4th 162, 171)(citations omitted.) In *Sierra Club*, the First District Court of Appeal determined the county had made a general appearance by "stipulating in writing to an order granting Sierra Club a 60-day extension to prepare the administrative record. That action acknowledged the authority of the court to grant the extension..." (*Id.* at 172.) The court found such action "waived any irregularities." (*Id.*)

Respondent has clearly made a general appearance in this matter. Such general appearance occurred first on February 7, 2020, when Respondent filed an opposition to the motion for summary judgment that included arguments going to the merits of the motion, not just an objection to the Court's jurisdiction. Respondent again made a general appearance on February 18, 2020, when the stipulation to continue the hearing on the motion was filed, having been signed by Respondent. Although these actions occurred subsequent to Petitioner's filing of the motion for summary judgment, such a motion is deemed to have been "made" at the hearing for purposes of the 60-days identified in Code of Civil Procedure section 437c. (*Sadlier v. Superior Court* (1986) 184 Cal.App.3d 1050.) Here, the hearing on this motion took place on September 15, 2020, a more than 60-days after Respondent made its general appearance in February 2020. Accordingly, the Court finds the motion for summary judgment is timely pursuant to Code of Civil Procedure section 437c.

The Court further notes that while Respondent repeatedly argued that *Chavez* mandates the Court order the parties to attempt to reconstruct the record, such an order is contraindicated in this matter by California Code of Regulations title 14, Section 746,

> ...the commission...shall comply with the following minimum safeguards to afford each applicant, licensee or permittee procedural and substantive due process when the commission considers revocation, suspension, transfer, reinstatement or waiver of renewal requirements for a license or permit including hunting and sport fishing license or permit privileges.
>
> (b) In the case where the applicant, licensee or permittee has already been convicted of a violation of the Fish and Game Code or any regulation pertaining to the activity licensed or permitted by said code, the commission shall comply with the following:
>
> ...
>
> (4) The proceedings of the hearing *shall be recorded by a court reporter* or an electronic tape recording system.

> (12) The applicant, licensee or permittee may request judicial review by filing a petition for writ of mandate in accordance with provisions of the Code of Civil Procedure within 30 days from the date of service (postmark) of the order. *The record of the proceedings as designated by the petitioner shall be prepared by the commission and delivered to petitioner's counsel* or, if appearing pro se, the petitioner within 30 days after petitioner's request and upon payment of the fee specified in Section 69950 of the Government Code. (Emphasis added.)

Respondent failed to provide the "minimum safeguards" to afford Petitioner substantive due process by failing to comply with this regulation. As such, any attempt to "reconstruct the administrative record" that falls short of providing Petitioner with a "record of the proceedings as designated by Petitioner" is insufficient. While the Court recognizes this finding differs from *Chavez*, the facts in *Chavez* did not involve a regulation explicitly requiring the recording of the proceedings and an affirmative duty on the part of Respondent, and therefore the remedy of reconstructing the record was, and remains, a factual possibility and not a legally deficient option.

Because the Order of Decision was based upon an incomplete administrative record and thus incapable of a meaningful review by the Court, the Order of Decision must be set aside. (*Aluisi v. County of Fresno* (1958) 159 Cal.App. 2d 823).

The motion for summary judgment is **GRANTED** and the Order of Decision is **VACATED WITHOUT PREJUDICE**. A judgment shall be issued in favor of Petitioner, and against Respondent, and a peremptory writ shall issue commanding Respondent to take action specially enjoined by law in accordance with the Court's ruling, but nothing in the writ shall limit or control in any way the discretion legally vested in Respondents. Respondent shall make and file a return within 60 days after issuance of the writ, setting forth what has been done to comply therewith.

SUPERIOR COURT OF CALIFORNIA, COUNTY OF SACRAMENTO

Gordon D Schaber Courthouse
720 Ninth STREET
Sacramento, CA 95814-1311

SHORT TITLE: Newman vs. California Fish and Game Commission

CLERK'S CERTIFICATE OF SERVICE BY MAIL (Minute Order)	CASE NUMBER: **34-2018-80002944-CU-WM-GDS**

I certify that I am not a party to this cause. I certify that a true copy of the Minute Order was mailed following standard court practices in a sealed envelope with postage fully prepaid, addressed as indicated below. The mailing and this certification occurred at Sacramento, California, on 09/21/2020.

Clerk of the Court, by: /s/ E. Higginbotham, Deputy

NHU Q NGUYEN
DEPUTY ATTORNEY GENERAL
PO BOX 944255
SACRAMENTO, CA 94244-2550

PAUL A BRISSO
THE MITCHELL LAW FIRM LLP
P.O.BOX 1008
EUREKA, CA 95502

CLERK'S CERTIFICATE OF SERVICE BY MAIL

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834-1997
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

CERTIFIED MAIL

April 29, 2020

Mr. Robert J. Silva

[redacted]

SUBJECT: **NOTICE OF DENIAL FOR REINSTATEMENT OF NONTRANSFERABLE LOBSTER OPERATOR, PERMIT NUMBER LON048**

Dear Mr. Silva:

This letter is in response to your request to reinstate your Nontransferable Lobster Operator Permit (NTLOP).

Authority-Lobster Operator Permit
Pursuant to California Code of Regulations (CCR), Title 14, Section 122(b)(4), applications for renewals of transferable and non-transferable lobster operator permits must be received by the California Department of Fish and Wildlife (Department) or, if mailed, postmarked no later than April 30 of each year. Late fees, late fee deadlines, and late renewal appeal provisions are specified in Fish and Game Code (FGC) Section 7852.2. Any person denied a permit under CCR, Title 14, Section 122(b)(4) may submit a written request for an appeal to the California Fish and Game Commission (Commission) explaining why their permit request should not be denied. Such requests must be received by the Commission within 60 days of the Department's denial.

Authority-Late Renewal Applications
FGC Section 7852.2(a) establishes a graduated late fee for any renewal application that is received after the deadline.

FGC Section 7852.2(b) states the Department shall not waive the applicable late fee. Additionally, FGC Section 7852.2(c) requires the Department to deny any application for renewal received after March 31 of the permit year following the year in which the applicant last held a valid permit for that fishery.

Reason for Appeal to the Department
In your letter dated April 10, 2020, you stated that you attempted to renew your permit at a Department office but were unable to do so because the office was closed to the public as a result of the Coronavirus pandemic. You also stated that you attempted to pay for your renewal over the phone but were told you could not do so. By the time your nephew was available to assist you with renewing your permit online, the March 31 deadline had already passed. You also stated that your intent was to make your permit active as part of your retirement plan.

Department Findings
Department license records show that you last held a valid NTLOP during the 2018-2019 permit year, which made you eligible to renew the permit for the 2019-2020 permit year.

Department Determination
Based on the previously stated information, your request to reinstate your NTLOP is denied, because you last held a valid NTLOP in the 2018-2019 permit year. The Department received your request for reinstatement on April 17, 2020. FGC Section 7852.2(c) requires the Department to deny any application for renewal received after March 31 of the permit year following the year in which the applicant last held a valid permit for that fishery.

Deadline to File an Appeal to the Fish and Game Commission
If you wish to appeal the Department's decision, you must submit a written appeal to the Commission either by mail at P.O. Box 944209, Sacramento, CA 94244-2090, or by email at fgc@fgc.ca.gov. Pursuant to FGC Section 7852.2(d), your written appeal must be received within 60 days of the date of this letter. The Commission, upon consideration of the appeal, may grant the renewal of the NTLOP. If the Commission grants the renewal, it shall assess the applicable late fees, which amount to $2,581.34. A fee schedule is enclosed.

If you have any questions or require further assistance, please contact Ms. Genalyn Lobel at (916) 928-5816 or Genalyn.Lobel@wildlife.ca.gov.

Sincerely,

Joshua Morgan, Chief
License and Revenue Branch

cc: Ms. Melissa Miller-Henson
Fish and Game Commission
Sacramento, CA

Ms. Genalyn Lobel
California Department of Fish and Wildlife
Sacramento, CA

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834-1997
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

April 29, 2020

Mr. Robert J. Silva (L54695)
Fees Required for Reinstatement of a
Nontransferable Lobster Operator Permit (NTLOP)
Permit Number LON048

Prior Year Fees		**Permit Fees**
2019-2020	Resident Commercial Fishing License	$145.75
	NTLOP	$820.50
	Late Fee (61 days to March 31, 2019)	$627.50
Prior Year Fees Due		**$1,593.75**

Prior Year permit fees must be paid before a 2020-2021 NTLOP can be issued.

Current Year Fees		
2020-2021	Resident Commercial Fishing License	$149.09
	NTLOP	$838.50
Total Current Fees		**$987.59**
Total Fees Due		**$2,581.34**

If the Fish and Game Commission grants the renewal of the permit, payment of $2,581.34 would be due.

Conserving California's Wildlife Since 1870

From: Jay Silva [redacted]@gmail.com>
Sent: Thursday, June 4, 2020 04:11 PM
To: FGC <FGC@fgc.ca.gov>
Subject: Appeal for NTLOP

Warning: This email originated from outside of CDFW and should be treated with extra caution.

To whom it may concern,

My name is Robert J. Silva, I am requesting an appeal for your decision for renewing my NTLOP. The permit number is, L54695. Do you to the COVID-19 epidemic I was unable to send in my fees on time.. as I am not good with computers I requested the help of my nephew to pay it unfortunately time lapses and I was late to make payment.

Based on my renewal fee payment history you can see I have almost never missed a payment. I am requesting to pay all fees and have my permit reinstated.

I am greatly appreciative of you taking the time to read this. I am happy to meet with you at any time to discuss this matter further...

Respectfully,
Robert J. Silva

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

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

October 2, 2020

California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090
FGC@FGC.Ca.Gov

Re: *In the Matter of Robert Silva*; Agency Case No. 20ALJ06-FGC

Dear Commissioners:

This letter is in response to Robert Silva's request to appeal the Department of Fish and Wildlife's ("Department") denial of his request to renew his Lobster Operator Permit, #LON048 ("LOP"). The LOP was last valid during the 2018-19 fishing year. The Department will not be participating in this appeal and accordingly, does not object to the renewal of the LOP for the 2020-2021 fishing year, provided that he pays all applicable fees.

The fees that Mr. Silva must pay to renew the LOP are described in Fish and Game Code, section 7852.2 ("Section 7852.2"), subdivision (a). Section 7852.2, subdivision (a) states:

> (a) In addition to the base fee for the license, stamp, permit, or other entitlement, the department shall assess a late fee for any renewal the application for which is received after the deadline, according to the following schedule:
> (1) One to 30 days after the deadline, a fee of one hundred twenty-five dollars ($125).
> (2) Thirty-one to 60 days after the deadline, a fee of two hundred fifty dollars ($250).
> (3) Sixty-one days or more after the deadline, a fee of five hundred dollars ($500).

To emphasize that these fees must be paid, Section 7852.2, subdivision (b) states that "The department shall not waive the applicable late fee," while subdivision (d) states "If the commission grants renewal, it shall assess the applicable late fee pursuant to subdivision (a)." The fees total $**2,581.34** (see attached fee schedule).

If you have any questions please contact me at the address above or by e-mail at David.Kiene@Wildlife.Ca.Gov.

Sincerely,

DocuSigned by:
David Kiene
A0254C8AA9A1D455...
DAVID KIENE
Senior Staff Counsel

Cc: Robert Silva

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834-1997
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

April 29, 2020

Mr. Robert J. Silva (L54695)
Fees Required for Reinstatement of a
Nontransferable Lobster Operator Permit (NTLOP)
Permit Number LON048

Prior Year Fees		**Permit Fees**
2019-2020	Resident Commercial Fishing License	$145.75
	NTLOP	$820.50
	Late Fee (61 days to March 31, 2019)	$627.50
Prior Year Fees Due		**$1,593.75**

Prior Year permit fees must be paid before a 2020-2021 NTLOP can be issued.

Current Year Fees		
2020-2021	Resident Commercial Fishing License	$149.09
	NTLOP	$838.50
Total Current Fees		**$987.59**
Total Fees Due		**$2,581.34**

If the Fish and Game Commission grants the renewal of the permit, payment of $2,581.34 would be due.

Conserving California's Wildlife Since 1870

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Certified Mail

August 10, 2020

Mr. Nicholas B. Perrone
[redacted]

Subject: **NOTICE OF DENIAL FOR REINSTATEMENT OF SALMON VESSEL PERMIT, PERMIT NUMBER SA0053**

Dear Mr. Perrone:

This letter is in response to your request to reinstate the Salmon Vessel Permit (SVP), Permit Number SA0053, for the F/V *Julie Ann* (FG00850).

Authority-Salmon Vessel Permit
Fish and Game Code (FGC) Section 8235(a) states that the owner of a permitted vessel, or that owner's agent, may apply for renewal of the permit annually on or before April 30, upon payment of the fees without penalty. Upon receipt of the application and fees, the Department of Fish and Wildlife ("Department") shall issue the permit for use of the permitted vessel in the subsequent permit year only to the owner of the permitted vessel.

Authority-Late Renewal Applications
FGC Section 7852.2(a) establishes a graduated late fee for any renewal application that is received after the deadline.

FGC Section 7852.2(b) states the Department shall not waive the applicable late fee. Additionally, FGC Section 7852.2(c) requires the Department to deny any application for renewal received after March 31 of the permit year following the year in which the applicant last held a valid permit for that fishery.

Reason for Appeal to the Department
In your letter received on July 27, 2020, you explained that your Commercial Boat Registration, Commercial Fishing License, and Commercial Fishing Salmon Stamp were all renewed but your SVP was not due to a mistake. You stated that it was an honest mistake and that you need the permit to make a living. You further explained that you have been fishing for 11 years and have not had a single violation.

Department Findings
Department license records show that the F/V *Julie Ann* last held a valid SVP in 2018-2019, which made you eligible to renew the permit for the 2019-2020 permit year.

Department Determination
Your request to reinstate the SVP for the F/V *Julie Ann* is denied because the F/V *Julie Ann* last held a valid SVP in the 2018-2019 permit year. The Department received your request for reinstatement of the SVP on July 27, 2020. FGC Section 7852.2(c) requires the Department to deny any application for renewal received after March 31 of the permit year following the year in which the applicant last held a valid permit for that fishery.

Deadline to File an Appeal to the Fish and Game Commission
If you wish to appeal the Department's decision, you must submit a written appeal to the Fish and Game Commission (Commission) either by mail at P.O. Box 944209, Sacramento, CA 94244-2090, or by email at fgc@fgc.ca.gov. Pursuant to FGC Section 7852.2(d), your written appeal must be received within 60 days of the date of this letter. The Commission, upon consideration of the appeal, may grant the renewal of the SVP. If the Commission grants the renewal, it shall assess the applicable late fees, which amount to $1,985.35. A fee schedule is enclosed.

If you have any questions or require further assistance, please contact Ms. Ruth Flores at (916) 928-7470 or Ruth.Flores@wildlife.ca.gov.

Sincerely,

Joshua Morgan, Chief
License and Revenue Branch

cc: Ms. Melissa Miller-Henson
Fish and Game Commission
Sacramento, CA

Ms. Ruth Flores
California Department of Fish and Wildlife
Sacramento, CA

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Mr. Nicholas B. Perrone
Fees Required for Reinstatement for a
Salmon Vessel Permit (SVP)
Permit Number SA0053
F/V *Julie Ann* (FG00850)

Prior Year Fees		**Permit Fees**
2019-2020 SVP		$ 45.84
	Late Fee (61 days to March 31, 2020)	$ 627.50
Prior Year Fees Due		**$ 673.34**
Current Year Fees		
2020-2021	Commercial Fishing License	$ 149.09
	Commercial Fishing Salmon Stamp	$ 87.55
	Commercial Boat Registration	$ 387.25
	SVP	$ 46.87
	Late Fee (61 days to March 31, 2021)	$ 641.25
Total Current Fees Due		**$ 1,312.01**
Total Fees Due		**$ 1,985.35**

If the Fish and Game Commission should recommend approval, full payment of $1,985.35 would be due.

RECEIVED
CALIFORNIA
FISH AND GAME
COMMISSION
2020 AUG 25 AM 7:57

To the fish and game commission:

This letter is my appeal to fish and game commission.

I did not know that my SVP salmon vessel permit did not get payed when I renewed the registration, commercial fishing license and salmon stamp.

This has been very stressful for me and my family. I need my permit to make a living. I have never had any violations with fish and game or the coast guard. This was a honest mistake not neglect please grant renewal of my SVP I am begging you. My boat was built specifically for salmon and the permit has been with the boat for a very long time

I have attached the letter I sent Ruth Flores and that she has sent back

Caption/owner Nicholas Perrone

Contact number [redacted]

Mailing address [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

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

October 2, 2020

California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090
FGC@FGC.Ca.Gov

Re: *In the Matter of Nicholas Perrone*; Agency Case No. 20ALJ08-FGC

Dear Commissioners:

This letter is in response to Nicholas Perrone's request to appeal the Department of Fish and Wildlife's ("Department") denial of his request to renew his Salmon Vessel Permit, #SA0053 ("SVP"). The SVP was last valid during the 2018-19 fishing year. The Fish and Game Commission ("Commission") received his appeal request on August 25, 2020. The Department will not be participating in this appeal and accordingly, does not object to the renewal of the SVP for the 2020-2021 fishing year, provided that he pays all applicable fees.

The fees that Mr. Perrone must pay to renew the SVP are described in Fish and Game Code, section 7852.2 ("Section 7852.2"), subdivision (a). Section 7852.2, subdivision (a) states:

> (a) In addition to the base fee for the license, stamp, permit, or other entitlement, the department shall assess a late fee for any renewal the application for which is received after the deadline, according to the following schedule:
> (1) One to 30 days after the deadline, a fee of one hundred twenty-five dollars ($125).
> (2) Thirty-one to 60 days after the deadline, a fee of two hundred fifty dollars ($250).
> (3) Sixty-one days or more after the deadline, a fee of five hundred dollars ($500).

To emphasize that these fees must be paid, Section 7852.2, subdivision (b) states that "The department shall not waive the applicable late fee," while subdivision (d) states "If the commission grants renewal, it shall assess the applicable late fee pursuant to subdivision (a)." The fees total $**1,985.35** (see attached fee schedule).

If you have any questions please contact me at the address above or by e-mail at David.Kiene@Wildlife.Ca.Gov.

Sincerely,

DocuSigned by:
David Kiene
0254C8A9A1D45E...
DAVID KIENE
Senior Staff Counsel

Cc: Nicholas Perrone

State of California – Natural Resources Agency
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Mr. Nicholas B. Perrone
Fees Required for Reinstatement for a
Salmon Vessel Permit (SVP)
Permit Number SA0053
F/V *Julie Ann* (FG00850)

Prior Year Fees	**Permit Fees**
2019-2020 SVP	$ 45.84
Late Fee (61 days to March 31, 2020)	$ 627.50
Prior Year Fees Due	**$ 673.34**
Current Year Fees	
2020-2021 Commercial Fishing License	$ 149.09
Commercial Fishing Salmon Stamp	$ 87.55
Commercial Boat Registration	$ 387.25
SVP	$ 46.87
Late Fee (61 days to March 31, 2021)	$ 641.25
Total Current Fees Due	**$ 1,312.01**
Total Fees Due	**$ 1,985.35**

If the Fish and Game Commission should recommend approval, full payment of $1,985.35 would be due.

The distribution of Kenwood Marsh checkerbloom is documented within the California Natural Diversity Database (CNDDB). The CNDDB documents “elements,” which are plant or animal taxa, or natural communities that are of conservation concern within California. For plants, an “element occurrence” (EO) is a location record for a site which contains an individual, population, or “colony” of a special status element. Populations, individuals, or colonies that are located within 1/4 mile of each other generally constitute a single occurrence (Bittman 2001).

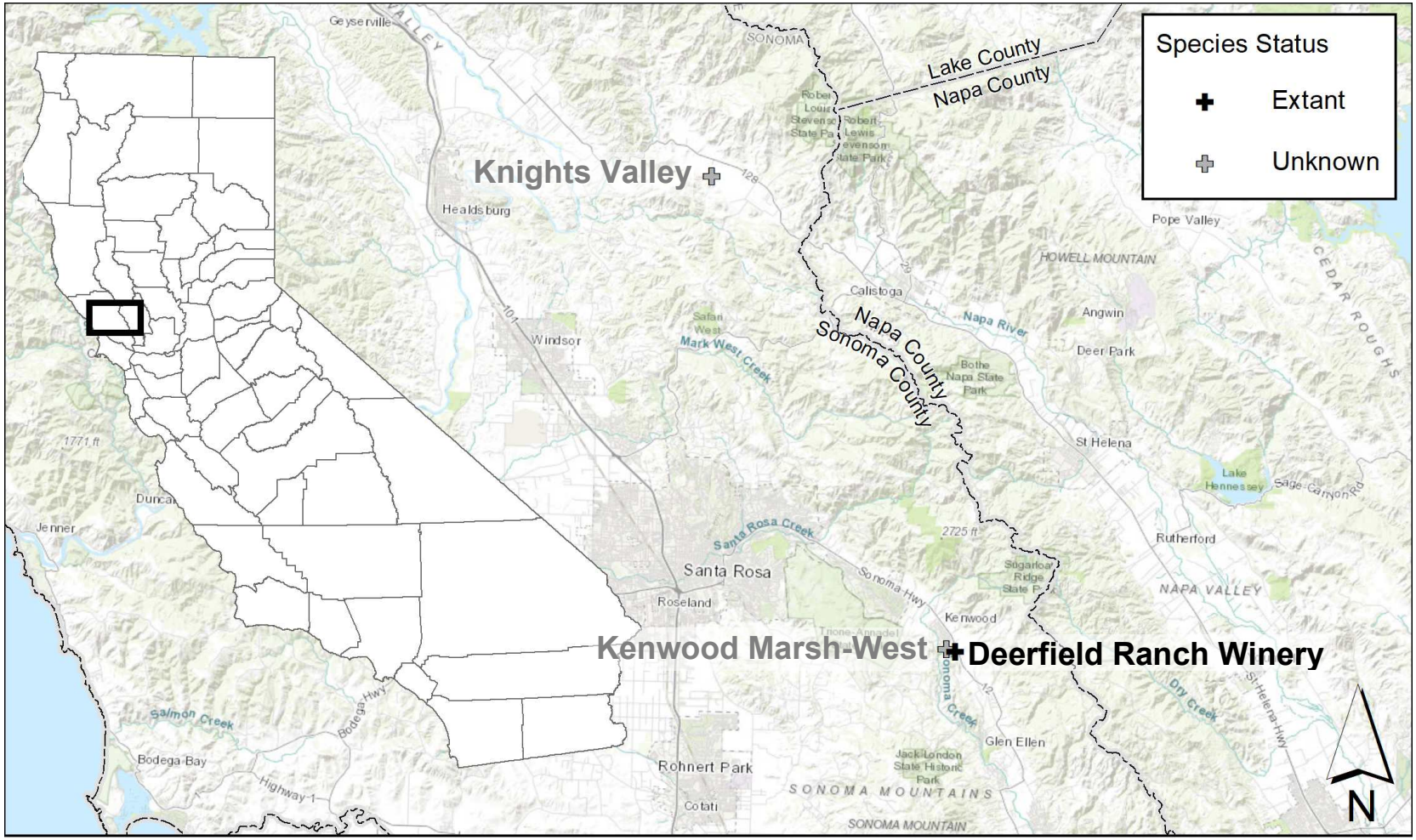
There are currently two occurrences of Kenwood Marsh checkerbloom that are documented in the CNDDB; however, one of these occurrences consists of two separately mapped parts. To make it easier to refer to the different occurrences and their parts in this species review, each occurrence or part of an occurrence has been named as a separate “population” in Table 1 and below. Kenwood Marsh is the element occurrence (EO 1) containing two populations and Knights Valley (EO 2) contains one population, for a total of three populations. The full known distribution of the species is displayed in Figure 3, and the three populations are described in more detail below.

- *Deerfield Ranch Winery* (extant) – this is the southernmost population on record and occurs in Kenwood Marsh on private property in the Kenwood U.S. Geological Survey 7.5-minute topographic quadrangle. There are herbarium collections dating back to 1927, presumably before much of Kenwood Marsh was developed for vineyards and housing. The last voucher specimen was collected in 1998. The population of Kenwood Marsh checkerbloom at this site is fenced and actively managed. In 2009, there were four subpopulations at this site (Table 2). Two of these subpopulations were natural; one was near the road in a clearing (“Road”, Fig. 4) and the other was about 50-80 m (165-265 ft) to the north among small willows (“Willow”). Two additional subpopulations were created in April 2009, one in the willows (“#3”) and one in open sun (“#4”), mimicking the two natural subpopulations (Symonds, pers. comm. 2019). The #4 subpopulation did not last more than a year, and by 2019, the other reintroduced subpopulation, #3, no longer supported any plants. As early as 2015, the natural patch in the willows appeared to be extirpated, so by 2019, the Road subpopulation was all that remained at Deerfield Ranch Winery.

- *Kenwood Marsh-West* (presumed extant) – this site is located about 400 m (0.25 mi) north-northwest of Deerfield Ranch Winery, and also in the Kenwood U.S. Geological Survey 7.5-minute topographic quadrangle. It is on private property and has not been monitored in over 15 years; its current status is unknown, but until the site can be surveyed, it is presumed to be extant.

- *Knights Valley* (presumed extant) – this is the northernmost population on record and occurs northwest of Calistoga, CA on private property in an area known as Knights Valley. The population is mapped within the Mount St. Helena U.S. Geological Survey 7.5-minute topographic quadrangle. There are herbarium collections dating back to 1890, with additional collections in 1979, 1984, and most recently, in 1998. This site was last surveyed in 2001.

Based on satellite images, the wetlands where the three populations are known have not been developed or converted, but without updated plant or hydrological surveys of the areas, it is not possible to determine if changes in hydrology or other threats have led to a change in the plant community, and to the extirpation of Kenwood Marsh checkerbloom in two of the three populations.



Background Image Source: ESRI (Topographic)

0 2.5 5 10 Miles

0 2.5 5 10 Kilometers

FIGURE 3. **Distribution and range map of Kenwood Marsh checkerbloom.** The only confirmed extant population is shown in black and populations of unknown status (presumed extant) are shown in gray.

FIGURE 4. Photos of the Road subpopulation at Deerfield Ranch Winery showing (a) the fenced enclosure protecting the only known extant patch, and (b) a closer view into the enclosure showing Kenwood Marsh checkerbloom in bloom surrounded by sedges (*Carex* spp.)**.** Photos by R. La Rosa.

B. POPULATION TREND AND ABUNDANCE

The periodic monitoring of Kenwood Marsh checkerbloom at Deerfield Ranch Winery and Knights Valley since 1981 shows fluctuating populations, but the way in which population sizes were estimated sometimes differed between years (Appendix C). Because Kenwood Marsh checkerbloom is a long-lived perennial with a large root stock, it can produce many stems each year, which each have branching inflorescences, so flower number per stem can vary greatly. Kenwood Marsh checkerbloom often grows among thick vegetation, making it difficult to determine which stems are growing from a common root base to identify individual plants. Plant surveyors have also been hesitant to get too close to plants for fear of trampling young plants (Symonds, pers. comm. 2019). Consequently, plant censusing across years has not been consistent and has sometimes estimated population size using different "currencies," such as number of genetic individuals, stem number, or number of blooming branch tips. This makes it difficult to compare population estimates across years to identify population trends. In the most recent survey of the single extant subpopulation in 2019, there were 16 flowering individuals, which was fewer than in previous years (Symonds, pers. comm. 2020). Deerfield Ranch Winery is the only site that has been monitored in any of the past 18 years; there is no information on population trends or abundance for the other two populations. Because the condition of the other two populations is unknown, they are presumed extant, but that is unconfirmed.

There is no genetic information from this species to give any indication of its genetic variability and its ability to adapt to changing environmental conditions. It is also unknown how much gene flow occurred between the two populations in Kenwood Marsh (Deerfield Ranch Winery and Kenwood Marsh-West), and whether or not they are one interbreeding population.

V. THREATS AND SURVIVAL FACTORS

A. FACTORS AFFECTING ABILITY TO SURVIVE AND REPRODUCE

At the time of listing in 1982, the threat to Kenwood Marsh checkerbloom was identified as modification and/or destruction of habitat (i.e., conversion of land to vineyards and urbanization). After its listing, the Department identified additional threats to the species in the first five-year species review (CDFG 1987), including cattle grazing and trampling, and competition. For this review in 2020, the Department has identified additional threats, including: human-related activities (e.g., climate change, mowing, and wildfire), predation (i.e., herbivory), competition from invasive species, and random events that pose a threat to species with small populations. Explanations of how these factors threaten Kenwood Marsh checkerbloom's survival are described below.

- *Present or threatened modification or destruction of its habitat* – Conversion of land to agriculture (i.e., viticulture) (CDFG 1981) was an immediate threat to Kenwood Marsh checkerbloom when it was listed in 1982. The area that supported habitat for Kenwood Marsh checkerbloom became increasingly fragmented as it was quickly being converted into vineyards. This conversion of land continues to threaten the survival of Kenwood Marsh checkerbloom, both directly and indirectly. At least two populations are now landlocked and surrounded by vineyards or reservoirs. Lack of adequate habitat adjacent to the current populations diminishes the chances of Kenwood Marsh checkerbloom expanding beyond its current restricted habitat.

In October 2019, the Kincade Fire burned 77,758 acres of Sonoma County, including the entire marsh in Knights Valley where Kenwood Marsh checkerbloom was most recently documented in 2001. It is not known how dry the marsh was leading up to the fire, the intensity of the fire (i.e., how hot it burned), or if Kenwood Marsh checkerbloom root stock or seeds were harmed. It is not known if Kenwood Marsh checkerbloom might benefit from periodic burns to also remove competing vegetation or buildup of dead plant material.

- *Herbivory* – Herbivores can pose a threat to Kenwood Marsh checkerbloom. The most likely herbivores were identified as: deer (*Odocoileus* sp.), slugs (several genera in the Phylum *Mollusca*), snails (*Helix aspersa*), spittle bugs (Family *Cercopidae*), and small rodents such as California voles (*Microtus californica*) (USFWS 2009; Symonds, pers. comm. 2019). These herbivores become a particular threat if a population is fenced, and the vegetation within the exclosure is not properly managed. Dense, overgrown vegetation has the potential to further attract the herbivores listed above.

- *Human-related activities* – In 1987, threats to the hydrology of the regions around the three Kenwood Marsh checkerbloom populations was identified in the Department's five-year species review (CDFG 1987). Because Kenwood Marsh checkerbloom is reliant on fresh water, the modification of regional hydrology through water diversion and wells can have devastating effects on populations. A private reservoir was built adjacent to the Knights Valley population sometime between 1993 and 2004, based on aerial photographs (UCSB 2019). The long-term effects of this reservoir on the adjacent marsh is not known, but it may be diverting water from the marsh.

  The landowner of Deerfield Ranch Winery fenced the Kenwood Marsh checkerbloom population around 2000 to protect it from the threat of mowing or other accidental destruction. There is no longer cattle grazing at Deerfield Ranch Winery (USFWS 2009), but it is unknown if there is currently grazing, or future plans to graze Knights Valley or Kenwood Marsh-West.

  Kenwood Marsh checkerbloom is susceptible to environmental changes associated with climate change (e.g., changes in temperature ranges and increased drought). The Climate Change Vulnerability Index (CCVI) quantifies the vulnerability of a species under current climate change models, using information on the needs of a species, its range, life history, and ecology (NatureServe 2016). Kenwood Marsh checkerbloom is rated as "Extremely Vulnerable" (CDFW 2019), meaning its "abundance and/or range are extremely likely to substantially decrease or disappear by 2050" (NatureServe 2016). The factors that greatly increase the vulnerability of Kenwood Marsh checkerbloom are: natural and anthropomorphic barriers (e.g., hills, dry upland habitat, and vineyards) that restrict the species' ability to shift its range in response to climate change; low dispersal, which limits the distance the species can move per generation; and a narrow physiological hydrological niche, because the species is restricted to wetlands and highly sensitive to drought (CDFW 2019). Other factors that increase its vulnerability are: low historical mean temperature variation (i.e., annual temperature range) of 9.4°C (49°F), which suggests Kenwood Marsh checkerbloom may not be well adapted to changes in climate; an historical hydrological niche, of very little variation in rainfall across the range (mean = 94 cm (37 in), st. dev. = 6.7 cm (2.6 in)); competition from other plant species; and reliance on pollinators for sexual reproduction.

- *Other natural occurrences* – With such small population sizes, confined to very small areas, Kenwood Marsh checkerbloom is highly vulnerable to random events. In 2012 rodents were likely responsible for the destruction of many reproductive stalks, reducing the population's ability to produce seed. Documented random events that have or may have negatively affected the natural population include rodent outbreaks, extended periods of inundation, and wildfire. Small populations are also susceptible to inbreeding depression, which results in low genetic variation and the potential inability to adapt to environmental changes (Ellstrand and Elam 1993). The ability to adapt is crucial in the face of climate change.

- *Competition* – Kenwood Marsh checkerbloom competes with dense surrounding vegetation for resources such as sunlight, soil moisture, and soil nutrients. Depending on the site, Kenwood Marsh checkerbloom competes with invasive species like velvetgrass (*Holcus lanatus*), Himalayan blackberry (*Rubus armeniacus*), and pennyroyal (*Mentha pulegium*). Kenwood Marsh also supports dense patches of sedges (*Carex* spp.) and common tule (*Schoenoplectus acutus* var. *occidentalis*), which were listed as a threat to the species in 1987.

B. Degree and Immediacy of Threats

Threats faced by Kenwood Marsh checkerbloom have increased since this species was placed on the list of endangered species in 1982. This species remains in extreme danger of extinction. Without continued protection of the natural populations, and management through recovery projects, Kenwood Marsh checkerbloom could become extinct at any time. Competition from dense surrounding vegetation, changes in hydrology from viticulture and climate change, loss of genetic diversity due to population reductions, and random events are likely the greatest threats to Kenwood Marsh checkerbloom. Timing and outcome of some of these types of threats are, by nature, unpredictable and require diligent monitoring and management actions to reduce the risk of extinction.

VI. MANAGEMENT AND RECOVERY

A. Impact of Existing Management Efforts

Management efforts have been undertaken only at Deerfield Ranch Winery. This management consisted of fencing subpopulations, collecting and storing seeds for long-term conservation, reducing dead plant material, and reintroducing cultivated plants to create new subpopulations. Funding to continue these activities has not been secured, and any management efforts are being conducted on a voluntary basis.

Current and past management efforts are described in more detail below.

i. Erecting Fence Exclosures

In 2000, the private landowner at Deerfield Ranch Winery fenced the two small subpopulations of Kenwood Marsh checkerbloom that were growing on the property (USFWS 2009). Fenced exclosures protect the species from human activities (e.g., mowing) and from grazing by large wildlife and livestock; however, fencing subpopulations also requires continued management to prevent a buildup of thatch and overgrown vegetation (see *ii.* below).

ii. REMOVAL OF THATCH

After the Road subpopulation at Deerfield Ranch Winery was fenced, thatch buildup became an issue because plant material could not be removed by other means (e.g., grazing or mowing). It built up over time, making it difficult for seedlings to become established. Current management is provided by the landowner and a team of volunteers, which visit the population annually to carefully remove dead plant material from around the Kenwood Marsh checkerbloom individuals. The thick layer of thatch is removed completely from the fenced exclosure. Anecdotally, removing thatch increases the number of seedlings (Symonds, pers. comm. 2020), benefitting the subpopulation. The subpopulation is too small to have control plots where thatch is left intact for an experimental comparison. The thatch removal occurs in the spring when plants are beginning to (re)sprout.

iii. CONSERVATION SEED STORAGE

In 2001, 2007, 2008, 2009 and 2018, about five percent or less of total seeds were collected by the Department, USFWS, or K. Symonds (CESA permit 2081(a)-09-04-RP) for the preservation of Kenwood Marsh checkerbloom (USFWS 2009; RSABG 2019; Symonds, pers. comm. 2019). Seeds were collected from Deerfield Ranch Winery and Knights Valley in 2001 and from only Deerfield Ranch Winery in subsequent years. The seeds are stored at Rancho Santa Ana Botanic Garden (RSABG) and the University of California Botanical Garden (UCBG) for long-term conservation. Some seeds from the 2007 collection were used for reintroduction efforts (see *iv* below) and were germinated by UCBG for reintroduction activities (USFWS 2009; Symonds, pers. comm. 2019). Seeds may also be stored by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), but the NRCS could not confirmation this.

iv. REINTRODUCTION OF PLANTS AT KENWOOD MARSH (2004-PRESENT)

Beginning in 2004, efforts to protect the population of Kenwood Marsh checkerbloom growing in Kenwood Marsh were undertaken through a collaboration between the private landowner, the USFWS, NRCS, and the Department. A Wildlife Extension Agreement between the landowner and USFWS was signed in 2007 with a cost-sharing agreement and conservation plan in place. ~~As part of the agreement, a permanent conservation easement was recorded in April 2007.~~ Prior to this agreement, the landowner had fenced the two subpopulations that occurred on the property.

Two reintroduced subpopulations were outplanted through a Wildlife Extension Agreement. A grant from the Partnership Program in 2007 allowed for plants to be grown at UCBG and outplanted into two new sites at Deerfield Ranch Winery in April 2009 with permission from the private landowner. The two natural sites differed in soil moisture, associated plants, and light levels (USFWS, in litt. 2008a); the two new small outplanting sites were chosen to mimic one of each of the natural sites (Table 2). The new subpopulations were fenced, and 13 mature individuals were planted into the wetter, shaded, #3 site, and nine were planted into the drier, full sun, #4 site.

These sites were monitored for ten years. The drier, full sun subpopulation (#4) failed to establish after just one year, likely due to the very wet winter in 2009-2010 (Symonds, pers. comm. 2020). The wetter, low light subpopulation (#3) had very large plants with large leaves for many years, but declined to zero by 2019. Symonds (pers. comm. 2020) hypothesized this was because the surrounding willows grew much larger and the site became too shady to support the subpopulation. In 2019, only the Road subpopulation supported Kenwood Marsh checkerbloom. The Wildlife Extension Agreement expired in

2017, but the landowner has continued conservation efforts on the property with help from local volunteers and non-profit organizations.

B. Recommendations for Management Activities and Other Recommendations for Recovery of the Species

The Department's recommendations for management and recovery of Kenwood Marsh checkerbloom begin with the continued preservation of the current natural populations through monitoring activities and promotion of recruitment of plants into the population. Recovery of Kenwood Marsh checkerbloom is dependent on reintroductions into the historical range of the species to boost the number of individuals and occurrences. Recommendations include:

- Continue outreach efforts to the private landowners in the historical range of Kenwood Marsh checkerbloom for permission to survey the remaining populations and to discuss employing tools such as Safe Harbor Agreements (Fish and G. Code § 2089.2 et seq.) to incentivize recovery and conservation of the species.
- Coordinate with other resource agencies and organizations to establish a formal recovery team to support the recovery efforts that began with a 10-year Wildlife Extension Agreement through the USFWS in 2007 (USFWS 2009). The USFWS is in the process of developing a recovery plan for the species (Bainbridge, pers. comm. 2019b).
- Continue collecting seeds following protocols that consider genetic diversity and rarity (e.g., RSABG 2009) and place them in long-term conservation storage at Department-approved facilities.
- Conduct research into developing habitat management techniques that improve the longevity and reproductive success of existing mature plants, and provide habitat for the successful establishment of seedlings.
- Conduct a genetic analysis of the natural population in Kenwood Marsh, and others if possible, to quantify current genetic diversity, providing the most scientifically-grounded information for making decisions about management actions. It is critical to preserve genetic diversity of the species to increase its chances of adapting to environmental changes (i.e., climate change). Care should be taken when collecting tissue for such genetic studies, seeking techniques that minimize impacts to the natural population. Additionally, understanding the genetics of the cultivated stock will facilitate recovery efforts to promote genetic diversity in any new introduced populations.
- Consider expanding the natural population by planting seedlings that have been cultivated from wild-collected seeds. However, all proposals should strongly weigh the risk of unintended introductions of pathogens or other factors that may negatively affect the current highly vulnerable population.
- Promote educational outreach to the communities in the range of Kenwood Marsh checkerbloom to promote botanical surveys. Model habitat criteria to identify possible suitable habitat in the vicinity of Kenwood Marsh and Knights Valley, then survey to locate new occurrences that may have gone undetected. Additionally, post-fire surveys of areas that were previously surveyed will be important to understand the effects of wildfire on Kenwood Marsh checkerbloom.

VII. RECOMMENDATION TO THE COMMISSION

Pursuant to Fish and Game Code, section 2077, the Department has prepared this Five-Year Species Review based upon the best scientific information available to the Department to determine if conditions that led to the original listing are still present. Based on this Five-Year Species Review, the Department submits the following recommendation to the Commission:

In completing this Five-Year Species Review for Kenwood Marsh checkerbloom, the Department finds there is sufficient scientific information to indicate that the conditions that led to the listing of Kenwood Marsh checkerbloom as endangered are still present, and recommends no change to the status of Kenwood Marsh checkerbloom on the list of endangered species at this time.

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APPENDIX A. Quaternary geologic deposits associated with Kenwood Marsh checkerbloom occurrences. Sites include Deerfield Ranch Winery (DRW), Kenwood Marsh-West (KMW) and Knights Valley (KV). Descriptions are taken from the California Geological Survey (CDOC 2010).

Geological Series	Population	Description
QPc	DRW, KMW	Pleistocene and/or Pliocene sandstone, shale, and gravels deposits; mostly loosely consolidated
Qoa	KMW	Older alluvium, lake, playa, and terrace deposits
Q	KV	Alluvium, lake, playa, and terrace deposits; unconsolidated and semi-consolidated

APPENDIX B. Soil composition of naturally occurring Kenwood Marsh checkerbloom sites. Sites include Deerfield Ranch Winery (DRW), Kenwood Marsh-West (KMW), and Knights Valley (KV). The soils series share a similar profile: fine-loamy texture, mixed topsoil, and superactive cation activity (Soil Survey Staff 2001, 2003, 2019).

Soil Series	Site	Texture	Topsoil	Cation activity	Soil group
Huichica	DRW, KMW	fine-loamy	mixed	superactive	thermic Abruptic Haplic Durixeralfs
Los Robles	KV	fine-loamy	mixed	superactive	thermic Typic Haploxerepts

APPENDIX C. Population and subpopulation census of Kenwood Marsh checkerbloom. Survey method likely differed between years, so counts may represent individuals, flowering stalks, or flower clusters. Populations include Deerfield Ranch Winery (DRW), Kenwood Marsh-West (KMW), and Knights Valley (KV). *flowering stalks only; ** reproductive individuals only.

Population	DRW	DRW	DRW	DRW	DRW	KMW	KV	Collector	Source
Subpop.	Road	Willow	#3	#4					Table 2
EO	1	1	1	1	1	1	2		CNDDB 2019
1979							<100	Unknown	USFWS 2009
1981							500	Unknown	CDFG 1981
1986					85		38	B & J Guggolz	CNDDB 2019
1987					136			B & J Guggolz	CNDDB 2019
1988					150	400		E. Parsons	USFWS, in litt. 2008c
1989					100	125		E. Parsons	USFWS, in litt. 2008c
1990					200	150		E. Parsons	USFWS, in litt. 2008c
1991					92	80		E. Parsons	USFWS, in litt. 2008c
1993							70	B & J Guggolz	CNDDB 2019
1993					600	500		N. Wilcox	USFWS, in litt. 2008c
1998					40+		47	B & J Guggolz	CNDDB 2019
2001					232*		25	G. Cooley	Cooley, in litt. 2001
2007					33			K. Symonds	USFWS 2019
2008	11	13			24			K. Symonds	USFWS, in litt. 2008b
2009			13**	9**				K. Symonds	Symonds, pers. comm. 2019
2010	126*		13**	0				K. Symonds	USFWS 2019
2012	42*	20*	39*	0	103*			K. Symonds	USFWS 2012
2013	162*	9*	14*	0	185*			K. Symonds	USFWS 2013
2016	256*							K. Symonds	Symonds, pers. comm. 2020
2019	16**	0	0	0	16**			K. Symonds	Symonds, pers. comm. 2019

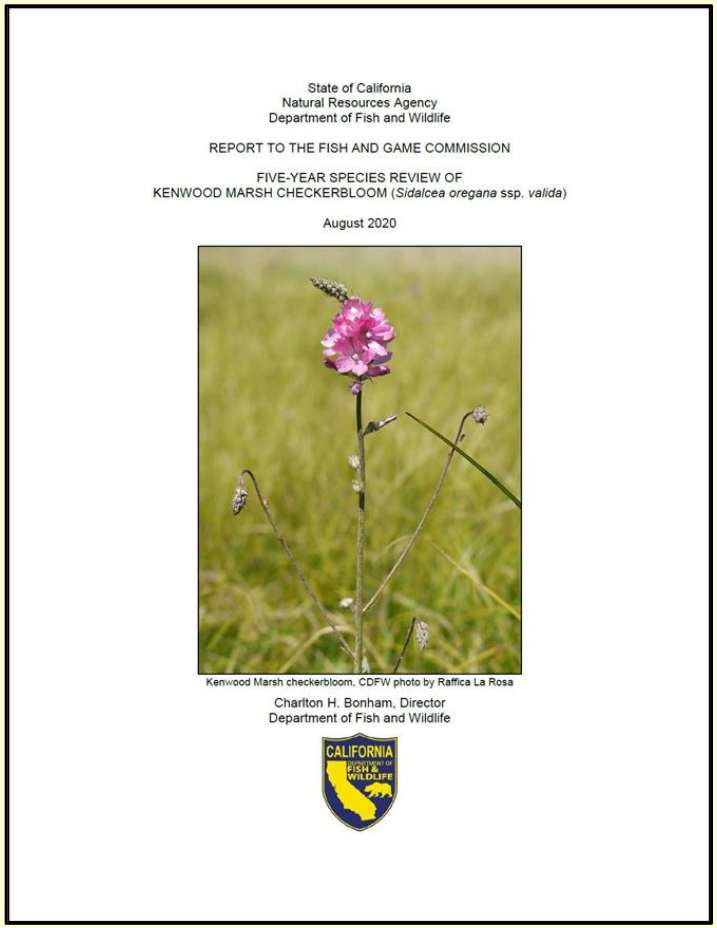
5-Year Species Review:

Kenwood Marsh checkerbloom
(Sidalcea oregana ssp. *valida)*

Fish & Game Commission Meeting

October 15, 2020

Raffica La Rosa, PhD
Native Plant Program
raffica.larosa@wildlife.ca.gov
(916) 376-8670



State of California
Natural Resources Agency
Department of Fish and Wildlife

REPORT TO THE FISH AND GAME COMMISSION

FIVE-YEAR SPECIES REVIEW OF
KENWOOD MARSH CHECKERBLOOM (*Sidalcea oregana* ssp. *valida*)

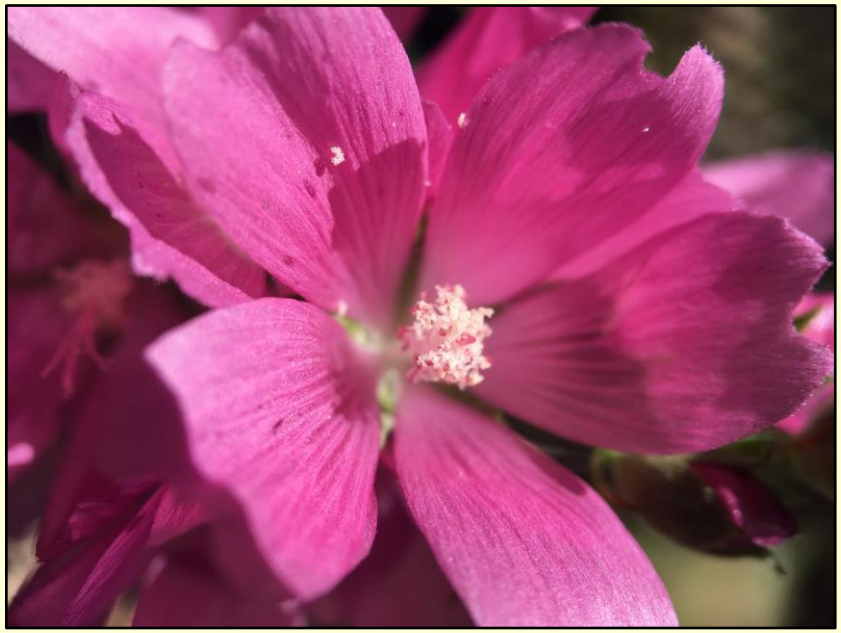
August 2020

Kenwood Marsh checkerbloom, CDFW photo by Raffica La Rosa

Charlton H. Bonham, Director
Department of Fish and Wildlife

Kenwood Marsh checkerbloom
(Sidalcea oregana ssp. *valida)*

Raffica La Rosa



Josh Hull

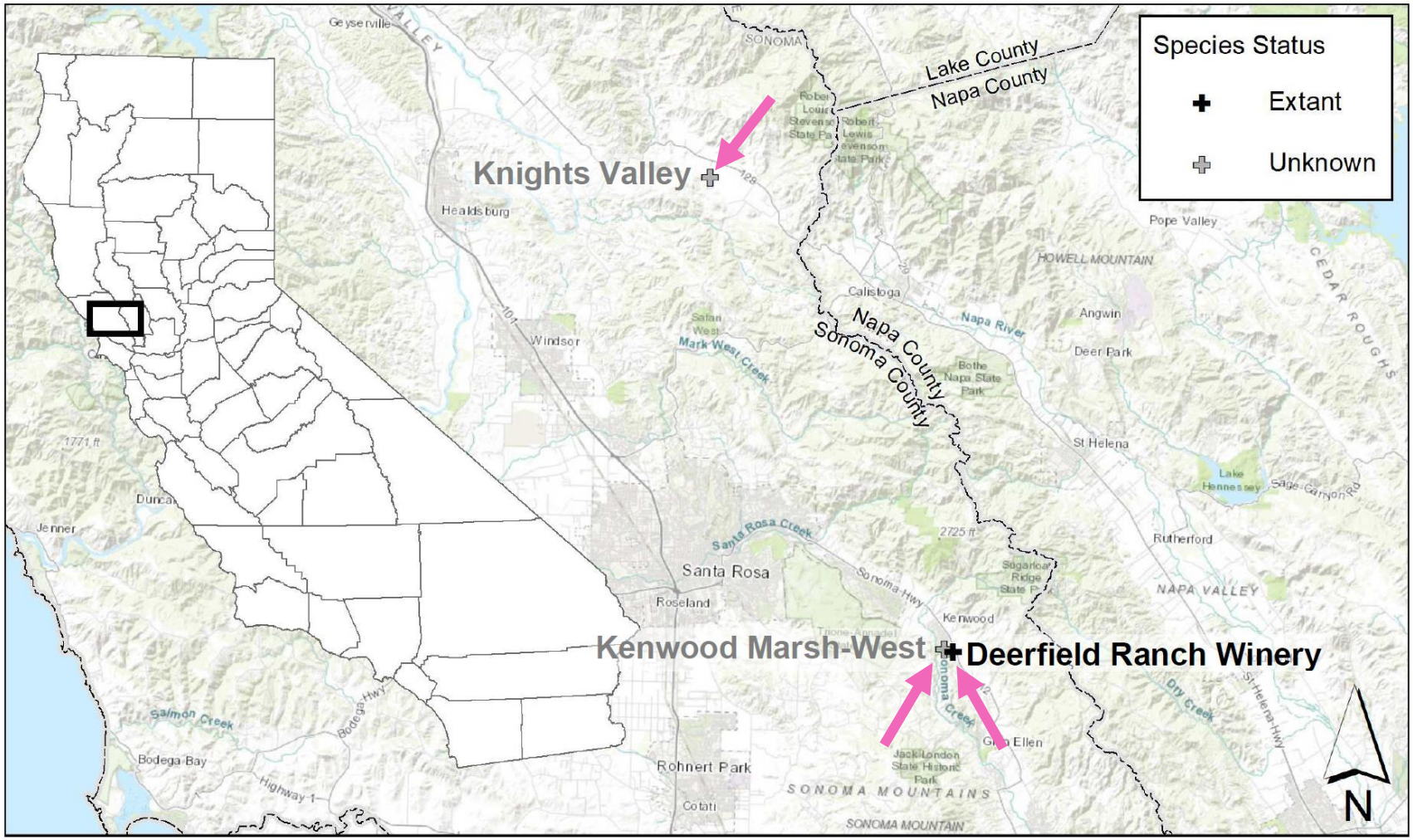
- Perennial
- Malvaceae (mallow family)
- Flowers June - September

Listing

- Listed as endangered under CESA in 1984
- Three documented populations
- Only in Sonoma Co.

Raffica La Rosa

Distribution



Background Image Source: ESRI (Topographic)

0 2.5 5 10 Miles

0 2.5 5 10 Kilometers

Population Status

Knights Valley

Kenwood Marsh

Threats to Survival

- **Modification or destruction of habitat**
  - Conversion to vineyards and pasture
  - Urbanization
  - Changes to hydrology*
  - Mowing*
  - Wildfire*
- Competition
- Climate change*
- Random events*
- Herbivory*

* Added in 2020

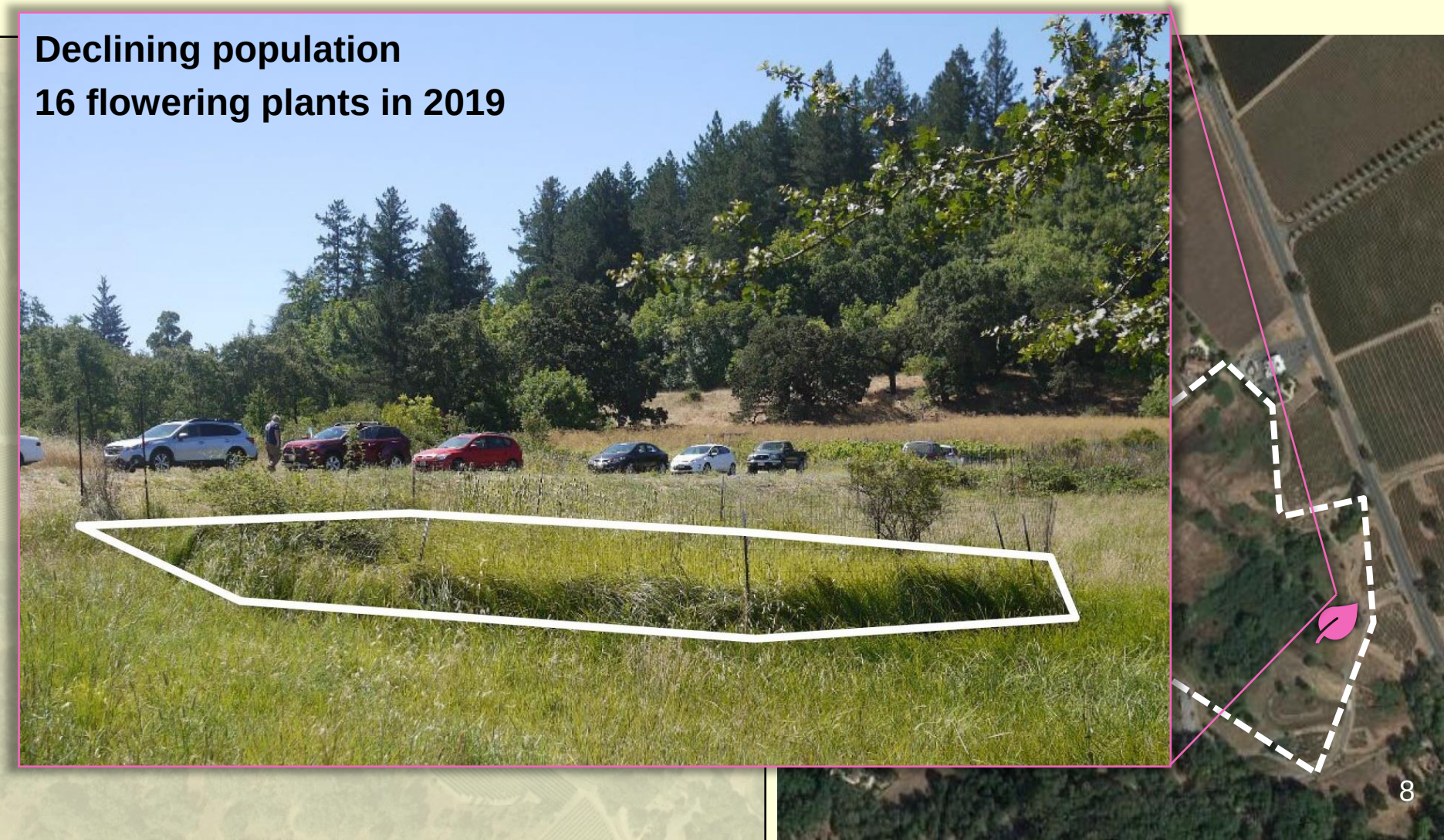
Modification/Destruction of Habitat

Knights Valley

Kenwood Marsh

Other Threats and Low Abundance

Kenwood Marsh



Management & Recovery

- Funding needed
- Two introductions (2009) failed to establish
- Proposed research and restoration to expand distribution
- Recovery plan by the U.S. Fish & Wildlife Service

Kate Symonds

Summary

- Only <u>one</u> confirmed population remains
- 16 reproductive plants in 2019
- Continues to be on the brink of extinction
- Many threats to its survival

Raffica La Rosa

Retain current status: Endangered

Questions ◈ Thank You

Kate Symonds

Raffica La Rosa, PhD
Native Plant Program
raffica.larosa@wildlife.ca.gov
(916) 376-8670

March 23, 2020

Eric Sklar, President
Melissa Miller-Henson, Executive Director
California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090
Via Email to: fgc@fgc.ca.gov

Re: Petition to revise listing status of Agassiz's desert tortoise from threatened to endangered

Dear President Sklar and Executive Director Miller-Henson:

On behalf of Defenders of Wildlife, the Desert Tortoise Council and Desert Tortoise Preserve Committee (Petitioners), I submit the attached petition to revise the listing of Agassiz's desert tortoise or desert tortoise (*Gopherus agassizii*) from threatened to endangered under provisions of the California Endangered Species Act (Fish and Game Code Sections 2050, et seq.) and Section 670.1, Title 14, California Code of Regulations (CCR).

Defenders of Wildlife is a national wildlife conservation organization founded in 1947 and is dedicated to protecting all wild animals and plants in their natural communities. To this end, we employ science, public education and participation, media, legislative advocacy, litigation, and proactive on-the-ground solutions to impede the accelerating rate of extinction of species, associated loss of biological diversity, and habitat alteration and destruction. Defenders of Wildlife has 1.8 million members and supporters in the U.S. including 279,000 in California.

The Desert Tortoise Council is a non-profit organization comprised of hundreds of professionals and laypersons who share a common concern for wild desert tortoises and a commitment to advancing the public's understanding of desert tortoise species. Established in 1975 to promote conservation of tortoises in the deserts of the southwestern United States and Mexico, the Council routinely provides information and other forms of assistance to individuals,

organizations, and regulatory agencies on matters potentially affecting desert tortoises within their geographic ranges.

The Desert Tortoise Preserve Committee is a non-profit organization formed in 1974 to promote the welfare of the desert tortoise in its native wild state. Committee members share a deep concern for the continued preservation of the tortoise and its habitat in the southwestern deserts. The Desert Tortoise Preserve Committee is dedicated to the recovery and conservation of the Desert Tortoise and other rare and endangered species inhabiting the Mojave and western Sonoran deserts.

The Fish and Game Commission listed the desert tortoise nearly 31 years ago as a threatened species on June 23, 1989. It was listed as a threatened species by the U.S. Fish and Wildlife Service in 1990 and followed by designation of its critical habitat in 1994.

Despite measures taken by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service and federal land management agencies, the desert tortoise continues to decline due to human related activities that include habitat loss and fragmentation, widespread invasion by non-native plants, mortality caused by motorized vehicles and infectious diseases. The species is in much worse condition now than when it was listed as a threatened species three decades ago and is now below what the U.S. Fish and Wildlife Service considers minimum viable density in 9 out of 10 critical habitat units in California.

Our petition provides ample evidence that the desert tortoise warrants listing as endangered throughout California. It is our hope that the Fish and Game Commission and its staff, as well as the Department of Fish and Wildlife find our petition a compelling rationale that leads to uplisting of this critically imperiled species to endangered.

Sincerely,

Pamela Flick
California Director
Defenders of Wildlife
980 Ninth Street, Suite 1730
Sacramento, California 95814
pflick@defenders.org

Attachment: Petition

FGC - 670.1 (3/94)

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: **Agassiz's desert tortoise or Mojave desert tortoise**

Scientific Name: **(*Gopherus agassizii*)**

II. RECOMMENDED ACTION:

(Check appropriate categories)

a. List ☐ b. Change Status ☒

As Endangered ☐ from **Threatened**

As Threatened ☐ **to Endangered**

Or Delist ☐

III. AUTHORS OF PETITION:

Names: Jeff Aardahl and Tom Egan for Defenders of Wildlife
Ed LaRue for Desert Tortoise Council
Ron Berger for Desert Tortoise Preserve Committee

Address: Jeff Aardahl, California Representative
Defenders of Wildlife
46600 Old State Highway, Unit 13
Gualala, CA 95445
(707) 884-1169

I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Signature: Jeff Aardahl Date: 3/11/2020

Address: Tom Egan, California Desert Representative
Defenders of Wildlife
P.O. Box 388
Helendale, CA 92342
(760) 221-7531

I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Signature: Date: 3/11/2020

I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Address: Ed LaRue, Chairperson Ecosystems Advisory Committee
Desert Tortoise Council
4654 East Avenue S. #257B
Palmdale, CA 93552

Signature: Date: 3/11/2020

Address: Ron Berger, President
Desert Tortoise Preserve Committee
4067 Mission Inn Avenue
Riverside, CA 92501

I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Signature: Date: 3/11/2020

PETITION TO THE STATE OF CALIFORNIA FISH AND GAME COMMISSION SUPPORTING INFORMATION FOR

Agassiz's desert tortoise or Mojave desert tortoise (*Gopherus agassizii*)
Common Name **Scientific Name**

EXECUTIVE SUMMARY

Based upon a scientific review of its distribution and status, this petition requests that the Agassiz's desert tortoise (*Gopherus agassizii*; Mojave desert tortoise or desert tortoise) be moved from listed as Threatened to Endangered by the California Fish and Game Commission (Commission). Despite federal and state protections, the desert tortoise is closer to extinction than it was in 1989 and 1990 when it was listed by the Commission and U.S. Fish and Wildlife Service (USFWS), respectively. A change in listing from Threatened to Endangered will reflect the current dire situation facing California's state reptile and is necessary to generate substantially increased attention and efforts to reverse the very real likelihood that desert tortoise will become extinct in California.

The Commission listed the desert tortoise as Threatened under the California Endangered Species Act (CESA) in 1989. The Mojave population of the desert tortoise was listed as Endangered under a federal emergency listing rule under the Endangered Species Act (ESA) by the USFWS that same year. In 1990, the Mojave population of the species was listed by the USFWS under a final ESA rule as Threatened (USFWS 1990). A recovery plan prepared by the USFWS for this federally-listed species was adopted in 1994 (USFWS 1994a), with Critical Habitat concurrently designated (USFWS 1994b). A revised recovery plan for the species, noting problems in implementing certain previous recovery plan actions, was adopted in 2011 (USFWS 2011).

The initial California listing of the desert tortoise as threatened was based on a severe decline of tortoises throughout California, Nevada, Utah, and northwest Arizona – with California populations considered the most endangered.

Recent genetic analysis has concluded that the Mojave population of the desert tortoise is a distinct species, not a population, with a range that includes southeastern California, southern Nevada, northwest Arizona, and southwest Utah (Murphy et al. 2011). Those tortoises occurring in the rest of Arizona and northwest/west Sonora, Mexico, have recently been described as a separate species, Morafka's desert tortoise (*Gopherus morafkai*), and those in southwest Sonora and Sinaloa, Mexico, as Goode's thornscrub tortoise (*Gopherus evgoodei*) (Edwards et al. 2016). The species occurring in California is best described as Agassiz's desert tortoise (*Gopherus agassizii*).

Thirty-years after its listing as Threatened under provisions of the CESA and ESA, Agassiz's desert tortoise is in worse condition with the species on a path to

extinction due to an increase in the number and severity of threats. Similarly, while Critical Habitat was designated for this species in 1994 and several federal resource management plans have been adopted by the Bureau of Land Management (BLM) and designed to improve habitat conditions, the sobering reality is that conditions on the ground have worsened for Agassiz's desert tortoise habitat over the long term, especially in California. More development and increased human uses have occurred in the California desert since listing, resulting in substantial loss of individuals, reduced recruitment, and substantial loss/degradation of habitat. Further, these threats are amplified by the effects of climate change on tortoise habitat. As a result, tortoise populations throughout **all** Recovery Units in California continue to decline.

Reversing the trend towards extinction and putting Agassiz's desert tortoise on a path towards recovery is difficult because the tortoise is a long-lived reptile, requiring up to 20 years to reach sexual maturity, and has a low reproductive rate over a long period of reproductive potential. The combination of a late breeding age and a low reproductive rate makes accomplishing desert tortoise recovery very challenging (USFWS 1994a). In addition, the continued, ongoing loss and degradation of the species' last remaining occupied habitat from a variety of authorized and unauthorized land uses, in an area of increasing human population growth, renewable energy development and generation, motorized vehicle recreation, and other human impacts, only makes the conservation and recovery of the desert tortoise even more challenging.

Threats to the species at the time of the 1990 federal listing as Threatened have not abated. Instead, they are more widespread and intense. The relatively recent expansion of military testing and training installations (United States Army National Training Center, Fort Irwin; United States Navy, Marine Corps Air Ground Combat Center, Twentynine Palms); development of large-scale renewable energy projects throughout the range of Agassiz's desert tortoise; and increased human population growth and activities in the California desert have resulted in concurrent tortoise mortality and habitat degradation/loss, both adjacent to human communities and at appreciable distances. Notably, tortoise populations located immediately adjacent to expanding human communities have disappeared.

Tortoises and their habitats are impacted by a myriad of authorized and illegal human activities that degrade or eliminate suitable creosote bush scrub and other vegetation communities needed as habitat. In particular, off-highway vehicle use, especially widespread, unregulated use on lands that are supposed to be protected, destroys and fragments habitat, injures and kills tortoise, and crushes tortoise burrows and eggs. Human activities also subsidize predators whose increased numbers prey on tortoises and facilitate invasion of non-native species of plants that degrade habitat quality and displace native forbs and grasses needed for adequate nutrition and reproduction/recruitment (Brooks and Berry 2006). Invasive, non-native plants also increase flammable fuel load to the point where wildfire, when it occurs, results in catastrophic megafires that kill tortoises

outright. Recovery from fire in Mojave and Colorado desert vegetation communities is extremely slow because these communities are not adapted to wildfire and non-native plants outcompete native species during the post-fire period (Brooks and Esque 2002).

Climate modeling predicts that California's deserts will experience longer and more frequent drought and increased temperatures. These climate conditions will impact tortoise habitat and food supply, the species' ability to reproduce and recruit tortoises, and its sensitivity as a cold-blooded reptile to increasing temperature extremes. These impacts combined with the ongoing impacts from human activities are endangering Agassiz's desert tortoise throughout California.

The USFWS has repeatedly identified high adult tortoise survivorship as a key factor in meeting tortoise recovery objectives (USFWS 1994a, 2011). However, science-based surveys (line distance sampling) extending over a 10-year period throughout the species' range in California and data from permanent study plots indicate this key factor is not being achieved (USFWS 2015). These surveys demonstrate that desert tortoise numbers are declining significantly and resulting in all three Recovery Units experiencing reduced numbers and densities that reflect a species on a trajectory toward extinction.

Based on systematic USFWS-designed line distance sampling conducted by the USFWS's Desert Tortoise Recovery Office (DTRO), from 2004 through 2014, adult tortoises in the three California Recovery Units (Western Mojave, Colorado Desert, Eastern Mojave) declined 51.3 percent from 119,029 individuals to 65,726 (USFWS 2015). It is noteworthy and troubling for the future survival and recovery of desert tortoise that these losses occurred within federally designated Critical Habitat Units for tortoises, which, in theory, receive a higher level of protection under provisions of the federal ESA and land use plans prepared by federal agencies, primarily by the BLM for public lands in the California Desert Conservation Area.

Adult tortoise densities in Critical Habitat within the Western Mojave Recovery Unit averaged 5.7 per square kilometer in 2004, in contrast with an average density of 2.8 per square kilometer in 2014. This serious reduction is consistent with the substantial decreases in tortoise population densities documented within all three Recovery Units in California (Allison and McLuckie 2018). Unfortunately, this current decline is a continuation of the downward population trends documented in the Western Mojave by BLM wildlife biologists using a series of one square-mile study plots beginning in 1979 and extending to 2002. Initial surveys on these plots documented adult desert tortoise densities ranging from 29 to 147 per square kilometer in much of the western Mojave Desert (Tracy et al. 2004). Using the available scientific survey data, **adult tortoise densities in the Western Mojave Recovery Unit declined by 85 to 95 percent between 1980 and 2014** and continue to decline to the present time.

According to Allison and McLuckie (2018), adult tortoise densities in the three California Recovery Units of Agassiz's desert tortoise declined at the following annual rates during the period 2004 through 2014: Colorado Desert –4.5%; Eastern Mojave –11.2%; and Western Mojave –7.1%.

Allison and McLuckie (2018) also concluded that:

- *Overall this threatened species is* ***experiencing large, ongoing population declines****, and* ***adult tortoise numbers have decreased by over 50% in some recovery units*** *since 2004*;

- ***Declining adult densities through 2014 have left the Western Mojave adult numbers at 49% and in the Eastern Mojave at 33% of their 2004 levels****. Such steep declines in the density of adults are only sustainable if there were suitably large improvements in reproduction and juvenile growth and survival. However, the proportion of juveniles has not increased anywhere since 2007, and in these two recovery units* ***the proportion of juveniles in 2014 has declined to 91% and 77% of their representation in 2004,*** *respectively*;

- *Recent attention has focused especially on increased predation risk in the Western Mojave, Eastern Mojave, and Colorado Desert recovery units due to prey-switching during droughts by* Coyotes *(Canis latrans) and especially by increasing abundance of* Common Ravens *(Corvus corax), which typically prey on smaller tortoises rather than on adults*;

- *The negative population trends in most of the* [Tortoise Conservation Areas] *TCAs for Mojave Desert Tortoises indicate that* ***this species is on the path to extinction under current conditions.*** *This may reflect inadequate recovery action implementation, slow response by tortoises and their habitat to implemented actions, or new and ongoing human activities in the desert that have not been mitigated appropriately. It may also be a result of stochastic or directional climatic events that impact large expanses of tortoise habitat (e.g., drought, fire, climate change) and are largely beyond the realm of local land management activities.* ***Our results are a call to action to remove ongoing threats to tortoises from TCAs, and possibly to contemplate the role of human activities outside TCAs and their impact on tortoise populations inside them.***

(Emphasis added).

The USFWS (1994a) has determined that the minimum viable density of adult tortoises is 3.9 tortoises per square kilometer (10 tortoises per square mile), and that populations with densities below this size are in danger of extinction. The USFWS (2015) has reported that the density of adult desert tortoises in the three

Desert Tortoise Recovery Units in California are less than the minimum viable density and are experiencing a declining trend.

In addition to the startling population declines, this species is also facing significant uncertainty regarding protections on federal land. The California Desert Conservation Area (CDCA) Plan is the primary document guiding management on BLM land and was amended by the Desert Renewable Energy Conservation Plan (DRECP) in 2016 and the West Mojave Plan Route Network and Livestock Grazing Project in 2019. The most recent West Mojave Plan provides for a continuation of excessive vehicle use and livestock grazing, which are two of the most important threats to the desert tortoise and its critical habitat. Further, there is a currently pending plan amendment to the DRECP that is anticipated to contain further reductions in protections to desert tortoise.

Based on the best available scientific information presented in this petition, naturally-occurring populations of Agassiz's desert tortoise are on the verge of extirpation in California from a variety of human-caused threats and warrant a change in their listing status from Threatened to Endangered. Defenders of Wildlife, Desert Tortoise Council and Desert Tortoise Preserve Committee (Petitioners) believe changing the status of the species from Threatened to Endangered under provisions of the California Endangered Species Act will result in improved conservation and management outcomes for this species because it will (1) accurately reflect its status under CESA, (2) better inform project proponents that the tortoise is in danger of extinction and they should move their projects out of tortoise habitat/linkage areas to avoid extinction in California, (3) result in fully mitigation/compensation for the direct, indirect, and cumulative impacts to the tortoise, (4) provide for the implementation of more recovery actions to prevent its extinction in California, and (5) result in a higher-level of analysis of impacts to this species by the California Department of Fish and Wildlife (CDFW) from proposed land use activities on both federal, state, local, and private lands. If California is going to have any hope of avoiding the extinction of its state reptile, Agassiz's desert tortoise, and reverse the current decline of the tortoise to move toward recovery, the Commission must act by changing the listing status of this species from Threatened to Endangered.

1. **POPULATION TRENDS**

Describe current population trends (with numbers and rate) and relate these to viable population numbers. Explain survey methodology used to arrive at numbers or estimates and what assumptions, if any, were involved.

Background:

Population Sampling Methodologies

Permanent Study Plots: In the late 1970s, the Bureau of Land Management implemented a sampling methodology to collect demographic data on desert tortoises at 47 study plots in the spring. The method was to survey the sites intensively, locating all living tortoises and shell remains (BLM 2002). From these 47 plots, BLM selected and established 15 permanent one square mile study plots at various locations in the three Recovery Units (Figure 1) for the desert tortoise in the California Desert Conservation Area – Western Mojave, Colorado Desert, and Eastern Mojave (BLM 2002, Berry 2003) (See Tables 1a and 1b below). One hundred percent of each plot was surveyed twice for live desert tortoises and tortoise sign (e.g., burrows, scat, tracks, etc.). Surveys occurred in spring for 60 days. Density estimates were determined using mark-recapture sampling methods. Abundance, sex ratio, mortality, size distribution, and other population attributes were determined from the data collected. Most study plots were surveyed from every year to every 10 years (Berry 2003). The results of the surveys were applied to adjacent areas.

From the data collected, BLM reported the abundance of all size classes of desert tortoises (e.g., hatchlings, juveniles, immatures, subadults, and adults), mortality, population density and trend, size-specific sex ratios, age structure, survivorship rates, and causes of mortality at the size class and population levels in the California desert when compared to prior surveys at each plot. BLM in Nevada and Utah implemented this methodology in 1981 and Arizona in 1987 (USFWS 2010). BLM surveyed these study plots until 1995 when the U.S. Geological Survey assumed the task in California (BLM 2002; BLM et al. 2005).

The permanent study plot method had its downsides and assumptions. These include:

- Because of the intensive search effort needed to survey 100 percent of each plot, most study plots were not surveyed annually.
- Placement of permanent study plots was not random.
- Generally, plots were located where densities of tortoises were found to be high. This placement was done to get an adequate sample size to determine density using mark-recapture calculations. Thus, density estimates from study plots when applied to adjacent areas could be greater or less than the actual densities.
- The assumption that tortoises do not enter or leave the study plot during the entire 60-day spring survey period is not likely being met for the mark-recapture method.
- Tracy et al. (2004) concluded that it was not appropriate to extrapolate data from these plots to serve as a range-wide population baseline from which to assess recovery.

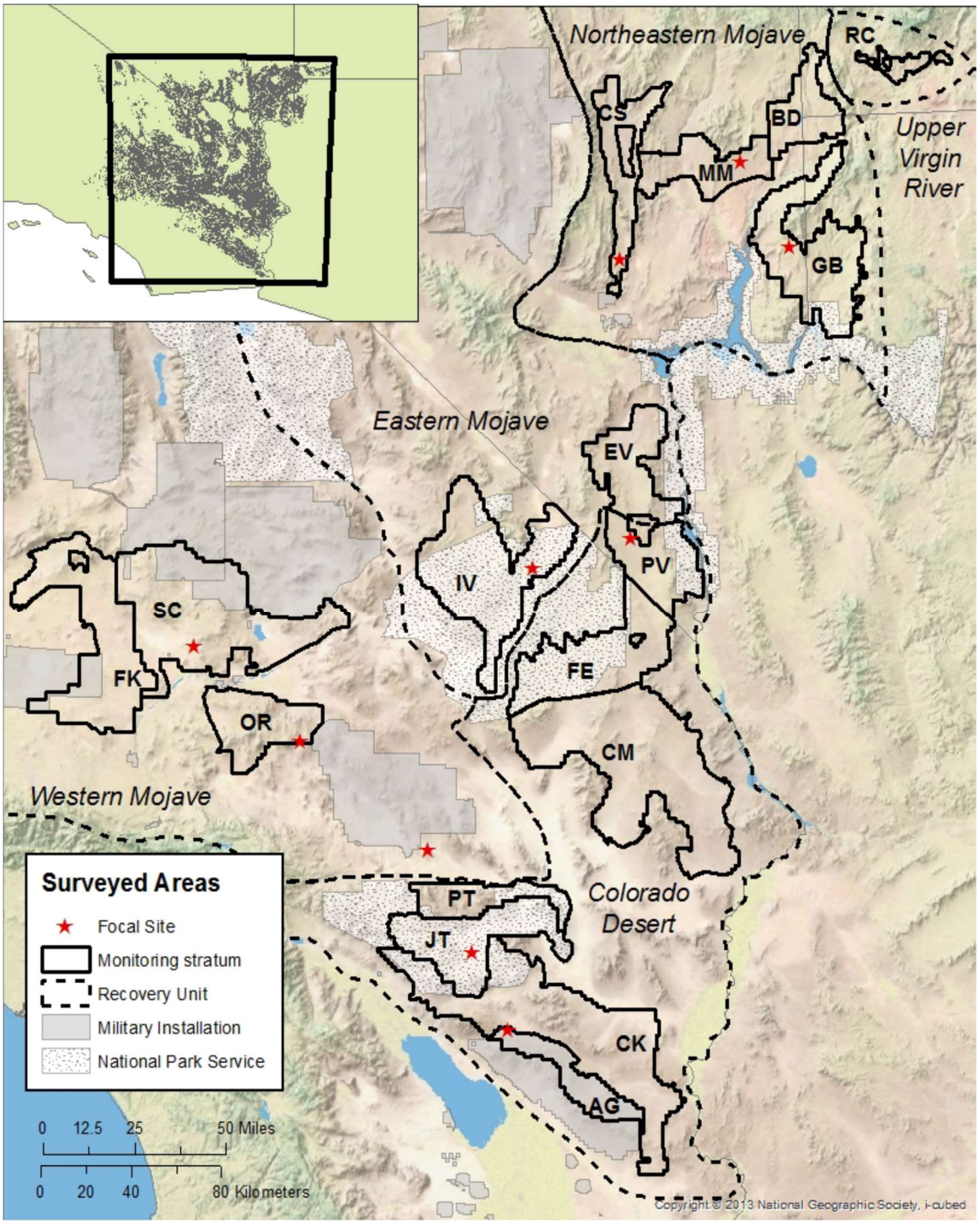


Figure 1. Map of the Recovery Units and Critical Habitat Units (CHUs) for Agassiz's desert tortoise. The CHUs in California are: FK = Fremont-Kramer, SC = Superior-Cronese, OR = Ord-Rodman, PT = Pinto Mountains, JT = Joshua Tree, CK = Chuckwalla, AG = Chocolate Mtns Aerial Gunnery Range, CM = Chemehuevi, FE = Fenner, IV = Ivanpah.

Line Distance Sampling: In June 1999, the interagency Desert Tortoise Management Oversight Group (DTMOG) adopted line distance sampling as the method for estimating adult desert tortoise abundance and density on a rangewide basis, and to detect long-term population trends (Anderson and Burnham 1996). This sampling method is intended to document rangewide population trends for adult desert tortoises over time and to determine whether the goals and objectives in the Recovery Plan regarding tortoise densities are being met. This monitoring strategy uses annual surveys on randomly placed line distance transects, with effort levels designed to detect long-term population trends (e.g., 10-year trends) in adult tortoises. This method was used beginning in 2001 by experienced survey crews under the direction of the USFWS DTRO, who publishes annual reports of line distance survey result reports (e.g., USFWS 2019a, 2020).

The downsides and assumptions of line distance sampling include:

- Line distance sampling collects data only to estimate the density of live adult tortoises. No systematic methodology is used to collect data on other population attributes (e.g., sex ratio, carcasses (mortality), cause of death, abundance or density of hatchling or juvenile tortoises, or short-term changes to population characteristics such as a catastrophic decline or remarkable increase) (USFWS 2006).
- Transects are not located randomly throughout the range of the desert tortoise. Rather, they are located randomly within CHUs, due to funding constraints and logistical issues. This methodology leaves occupied tortoise habitat outside these areas and areas needed for connectivity between CHUs/TCAs/Desert Wildlife Management Areas (DWMAs) unsurveyed.
- There are no trend data for tortoise populations outside CHUs.
- CHUs are more likely to be managed for the tortoise and its habitat than habitat outside CHUs and more likely to have greater densities of tortoises than areas outside CHUs. Therefore, the density estimates for adult tortoises in CHUs obtained from line distance sampling would likely be greater than for areas outside the CHUs in tortoise habitat and greater than rangewide density estimates. Thus, the line distance sampling does not provide a rangewide density estimate; it provides a density estimate for CHUs.
- Like permanent study plots, CHUs are not surveyed annually but about once every 3 years.
- Results from the range-wide line distance sampling survey program for population monitoring in CHUs/TCAs/DWMAs are intended to provide a baseline from which recovery criteria for stable populations within recovery units may be measured (USFWS 2006). However, collection of this baseline data was started in 2001. This is 12 years after listing Agassiz's desert tortoise as under CESA and ESA. Desert tortoise densities and abundance continued to decline from 1989/1990 (date of listings) to 2001. Using tortoise densities obtained from 2001 and later implies that although

listed as threatened, the densities of tortoises could decline further and still achieve recovery. A more appropriate approach would have been to use densities at the date of listing as the baseline.

CHUs for Agassiz's desert tortoises receive, in theory, greater protection under ESA provisions for federal actions because of the prohibition of adversely modifying or destroying Critical Habitat under ESA Section 7(a)(2). In spite of this prohibition, recent programmatic plans by the BLM in the California deserts have designated Extensive Recreation Management Areas (ERMAs) and Special Recreation Management Areas (SRMAs) in hundreds of thousands of acres of Critical Habitat for the tortoise (BLM 2016). BLM has also opened Cuddeback and Coyote dry lake beds within Critical Habitats in the Western Mojave Desert to unrestricted motorized vehicle use (BLM 2019).

With greater protection afforded to desert tortoise habitat within designated Critical Habitat, one would assume that tortoise populations occurring in Critical Habitat would have higher densities, a higher probability of recovery, and upward population trends over time with implementation of developed recovery plan actions. However, when analyzing the data from multiple years of line distance sampling, this assumption, has proven incorrect (Berry et al. 2014, USFWS 2015), and exactly the opposite. (See "Line Distance Sampling Results.")

Population Viability for Agassiz's Desert Tortoise

In the 1994 Recovery Plan for the Mojave Population of the Desert Tortoise, the USFWS determined that the minimum viable tortoise population density is 3.9 adults per square kilometer, or approximately 10 per square mile. In calculating this detailed population viability analysis, many assumptions were factored into this analysis, including a male-female ratio of 1:1 (i.e., the number of female tortoises should not be less than the number of male tortoises) (USFWS 1994a), and certain minimum areas of conserved habitat (reserves) would be established and managed, with most of these areas geographically linked by adjacent borders or corridors of suitable tortoise habitat. Populations of Mojave desert tortoises with densities below this amount are not viable and in danger of extinction (USFWS 1994a).

At the time the 1994 Recovery Plan was written, there was less consideration of the potentially important role of drought and climate change in the desert ecosystem, and with regard to desert tortoises and tortoise habitats in particular. In the meantime, studies have documented vulnerability of juvenile (Wilson et al., 2001) and adult tortoises (Peterson 1994, 1996; Henen 1997; Longshore et al., 2003) to drought (USFWS 2006).

The analysis of population viability for the desert tortoise used (1) population densities as of the early 1990s and size of reserves (i.e., areas managed for the desert tortoise), and (2) the population numbers (abundance) as of the early

1990s and size of reserves. As population densities for the Mojave desert tortoise decline, reserve sizes must increase, and as population numbers (abundance) for the Mojave desert tortoise decline, reserve sizes must increase (USFWS 1994a).

Reserve design (USFWS 1994a) and designation of Critical Habitat were based on the population viability analysis from numbers (abundance) and densities of populations of the Mojave desert tortoise in the early 1990s. Inherent in this analysis is that the lands be managed with reserve level protection (USFWS 1994a) or ecosystem protection as described in section 2(b) of the federal ESA, and that sources of mortality be reduced so recruitment exceeds mortality (that is, lambda >1)(USFWS 1994a).

Permanent Study Plot Results

Since the permanent study plots were first established in the late 1970s to 2002, tortoise populations have experienced declines both in numbers of tortoises registered during the surveys and in densities of live tortoises (Berry and Medica 1995, Brown et al. 1999, Berry et al. 2002). Declines of >50% and up to 96% have occurred regardless of initial densities (Berry 2003). Declines in numbers and densities of live tortoises were confirmed by corresponding increases in carcasses, including remains of marked tortoises (Berry 2003).

Beginning in the 1980s, high tortoise mortality associated disease was documented throughout the western Mojave Desert, and shortly thereafter, in populations within the eastern Mojave Desert in California and Nevada. Disease outbreak was first detected in surveys at the Desert Tortoise Research Natural Area (DTRNA) study plot (Brown et al. 1999) on the west edge of what is now the Fremont-Kramer CHU and subsequently in populations in adjacent Critical Habitat Units (i.e., Fremont-Kramer and Superior-Cronese).

Table 1a. Estimated annual densities of adult Agassiz's desert tortoises (midline carapace length (MCL) >180 mm) during 60-day spring surveys using mark-recapture methodology at one square-mile permanent study plots in two of the three Agassiz's Desert Tortoise Recovery Units and Critical Habitat Units (CHUs)/Tortoise Conservation Areas (TCAs)/Desert Wildlife Management Areas (DWMAs) in California. Density is in adult tortoises/square-kilometer. DTRNA = Desert Tortoise Research Natural Area.

	Western Mojave Recovery Unit								**Eastern Mojave Recovery Unit**	
CHU/TCA/ DWMA	**Fremont-Kramer**				**Superior-Cronese**	**Ord-Rodman**			**Ivanpah**	
Permanent Study Plot	DTRNA Interpretive Plot	DTRNA Interior Plot	Fremont Valley Plot	Kramer Hills Plot	Plots established by National Training Center	Lucerne Valley	Johnson Valley	Stoddard Valley	Ivanpah	Shadow Valley
Year Surveyed										
1977									37- 46 (1)	
1979	56 (2)	34 (2,8)						20 (2)	40 (2)	XXX
1980				29 (3)		30-35 (3, 9)	23-26 (3, 9)			
1981									38-50 (4)	
1982				30 (5)						
1985	61 (6)									
1986						29 (9)	19 (9)		XXX	
1988										XXX
1989	XXX	61(8)								
1990						25 (9)	6 (9)		XXX	
1992										XXX
1993	XXX									
1994						25 (9)	6(9)		XXX	
1997	8 (7)									

XXX– Sampled but data unavailable

(1) Berry 1978
(2) Berry 1980, BLM et al. 2005
(3) Berry 1981, BLM et al. 2005
(4) Turner, F., et al. 1982. DTC Symposium
(5) Berry, Nicholson; Juarez, and Woodman 1986
(6) Berry Shields, Woodman, Campbell, Roberson, Bohuski, and Karl 1986
(7) Berry, Stockton, and Shields 1998
(8) Berry, Woodman, and Knowles 1989
(9) BLM and CDFG 2002
(10) BLM 2002

Table 1b. Estimated annual densities of adult Agassiz's desert tortoises (MCL >180 mm) during 60-day spring surveys using mark-recapture methodology at one-mile^2 permanent study plots in the third Agassiz's Desert Tortoise Recovery Unit and Critical Habitat Units (CHUs)/Tortoise Conservation Areas (TCAs)/Desert Wildlife Management Areas (DWMAs) in California. Density is in adult tortoises/kilometers^2.

	Colorado Desert Recovery Unit								
CHU/TCA/ DWMA	**Chuckwalla**		**Chemehuevi**		**Fenner**		**Joshua Tree**	**Pinto Mountains**	**Chocolate Mtns AGR**
Permanent Study Plot / **Year Surveyed**	Chuckwalla Valley II Plot	Chuckwalla Bench Plot	Chemehuevi Wash Plot	Ward Valley Plot	Fenner	Goffs	Joshua Tree	No study plots	No study plots
1978							17-18 (1)		
1979		59 (5)	12-16 (2,5)						
1980	17(5,6)			29 (4,6)		61 (4)			
1982		61 (5)	15 (5)						
1983						XXX			
1984						XXX			
1985						XXX			
1986						XXX			
1987	XXX			XXX					
1988		43 (6)	XXX						
1990		XXX				XXX			
1991	XXX			XXX			45* (3)		
1992		XXX	XXX				51* (3)		
1993							47* (3)		
1994						XXX			
1995				XXX					
1996			XXX						
1997		XXX							
2000						XXX			

(1) Barrow 1979
(2) Berry 1980
(3) Freilich, J. and B. Moon 1993* Densities reported for all tortoises rather than adults.
(4) Berry 1981
(5) Berry, Nicholson; Juarez, and Woodman 1986
(6) Berry 1981
(7) Berry, Woodman, and Knowles 1989

XXX – Sampled this year but data unavailable

In the Western Mojave Recovery Unit, between 1982 and 1992, the overall tortoise population at the DTRNA declined by 86% with the adult population declining by about 94%, primarily due to *Mycoplasmosis* disease mortality (Brown et al. 1999). Juvenile tortoise mortality occurred primarily from Common raven (*Corvus corax*) predation. Tracy et al. (2004) concluded that the apparent downward trend in desert tortoise populations in the western portion of the range (Western Mojave Recovery Unit) that was identified at the time of listing from permanent study plot data was valid and ongoing from several threats including disease.

In the Colorado Desert Recovery Unit, BLM and CDFG (2002) reported that populations of desert tortoises "have declined precipitously in some parts of the range, such as the Chuckwalla Bench….Population estimates of permanent study plots at Chemehuevi Valley and Chuckwalla Bench have shown declines as high as 90 percent over the past decade" (i.e., early 1990s to 2000s).

Surveys in the eastern Mojave Desert (i.e., Goffs, California) (Colorado Desert Recovery Unit) have found high levels of Agassiz's desert tortoise mortality attributable to tortoise shell (*dyskeratosis*) and respiratory tract (*mycoplasmosis*) diseases (Berry 2000). Surveys performed in 2000, eleven years after state listing of the desert tortoise as Threatened, revealed that all tortoise size classes in sampled eastern Mojave Desert Critical Habitats had declined by as much as 76-80% from previous tortoise population estimates. The decline rate in larger tortoise size classes, which have a greater reproductive contribution to the population [i.e., larger females produced larger clutch sizes (Wallis et al. 1999)], was estimated to have declined by as much as 90% from previous estimates (Berry 2000, BLM 2002).

Lovich (2016) reported on the trend of desert tortoise densities in Joshua Tree National Park (Colorado Desert Recovery Unit). He noted tortoise populations "decreased in size during droughts." And, "What was once a robust and large population of tortoises in the early 1990s declined precipitously by 2012."

In the Eastern Mojave Recovery Unit in California, surveys performed in 2000, eleven years after state listing of the desert tortoise as Threatened, revealed that all tortoise age classes sampled in the CHUs of the Eastern Mojave Recovery Unit had declined by as much as 76-80% from previous tortoise population estimates. The decline rate in larger tortoise size/age classes, which have a greater reproductive contribution to the population, was estimated to have declined by as much as 90% from previous estimates (Berry 2000).

Line Distance Sampling Results

The USFWS Desert Tortoise Recovery Office has published reports of annual line distance sampling results since 2001 (e.g., USFWS 2019a, 2020). The first multi-year report was issued in 2006 for years 2001-2005.

Below are the results of line distance surveys by year (2001-2019) and change in estimated abundance of adult tortoises by Recovery Unit and Critical Habitat Unit in

California (Table 2) (USFWS 2006, 2009, 2010, 2011, 2012b, 1012c, 2013, 2014, 2015, 2016a, 2018, 2019, 2020).

Table 2. Density of adult Agassiz's desert tortoises (>180 mm MCL) per km^2 by year (2001-2018) in Critical Habitat Units designated for the species within California.

Year	Western Mojave Critical Habitat Unit			Eastern Mojave Critical Habitat Unit	Colorado Desert Critical Habitat Unit					
	Fremont-Kramer	Superior-Cronese	Ord-Rodman	Ivanpah	Chuckwalla	Chemehuevi	Fenner	Chocolate Mountains AGGR	Pinto Mountains	Joshua Tree
2001	5.5	4.3	10.1	2.8	10.1	7.2	15.7	No data	6.5	5.8
2002	4.7	8.1	13.1	5.4	7.7	No data	3.7	No data	4.0	3.3
2003	3.4	7.8	4.1	No data	4.0	6.3	2.8	No data	3.8	2.7
2004	6.1	4.5	5.2	4.7	6.4	6.9	8.7	No data	2.2	1.7
2005	5.7	6.7	8.1	4.6	7.9	10.8	14.0	No data	10.3	2.8
2006	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data
2007	2.7	6.3	8.2	6.5	4.5	4.6	6.6	7.1	2.4	2.8
2008	0.4	1.4	3.8	3.8	3.2	3.6	5.0	3.4	2.5	1.8
2009	3.3	4.9	7.1	4.0	0.0	9.2	8.1	7.3	5.0	2.3
2010	2.5	2.6	7.5	1.0	3.7	4.2	6.9	13.8	3.4	2.8
2011	3.5	3.4	3.2	4.5	3.9	4.0	6.8	No data	3.3	3.5
2012	2.2	4.4	4.6	2.8	3.9	0.8	0.9	6.1	3.7	3.4
2013	No data	No data	No data	No data	No data	No data	No data	7.3	No data	No data
2014	4.7	2.5	3.5	2.3	3.3	2.8	4.8	8.4	2.4	3.7
2015	4.5	2.6	No data	1.9	No data	No data	No data	10.3	No data	No data
2016	No data	3.6	No data	No data	No data	1.7	5.5	8.5	2.1	2.6
2017	4.1	1.7	3.9	No data	4.3	No data	No data	9.4	2.3	3.6
2018	No data	No data	2.5/3.4*	3.7	No data	2.9	6.0	7.6	No data	No data
2019	2.7	1.9	2.1	2.6	1.8	No data	2.8	7.0	1.7	3.1

*Density of 2.5 adult tortoises per km^2 in the Ord-Rodman CHU is for resident tortoises only. The 3.4 adult tortoises per km^2 includes the tortoises translocated from the expansion area of the Marine Corps Air Ground Combat Center to Ord-Rodman CHU that were found during transect sampling.

USFWS (2006) reported low tortoise densities across recovery units from 2001-2005 and are indicative of a continuing long-term decline of tortoise abundance and population densities throughout the Mojave and Colorado deserts in California. This decline was first reported in the 1980s and resulted in the Commission listing the desert tortoise as Threatened in 1989 and USFWS following in 1990.

In their 2015 report, the USFWS provides an aggregate analysis of the data from 2004 through 2014 to determine the trend of adult desert tortoise (>180 mm midline carapace length) densities and abundance from rangewide sampling in CHUs/TCAs/DWMAs (Table 3).

Table 3. Summary of 10-year trend data (from 2004 to 2014) for Recovery Units and Critical Habitat Units (CHU)/Tortoise Conservation Areas (TCA)/Desert Wildlife Management Areas (DWMAs) for Agassiz's desert tortoise, *Gopherus agassizii* (=Mojave desert tortoise*)* in California The table includes the area of each Recovery Unit and CHU/TCA/DWMA, percent of total habitat for each Recovery Unit and CHU/TCA/DWMA, density (number of breeding adults/km^2 and standard errors = SE), and the percent change in population density between 2004-2014. Populations below the viable level of 3.9 breeding individuals/km^2 (10 breeding individuals per mi^2) (assumes a 1:1 sex ratio (i.e., number of adult females equal to or greater than adult males) and showing a decline from 2004 to 2014 are in red (USFWS 2015).

Recovery Unit Designated Critical Habitat Unit/Tortoise Conservation Area/Desert Wildlife Management Area	Surveyed area (km^2)	% of total habitat area in Recovery Unit & CHU/TCA	2014 density/km^2 (SE)	% 10-year change (2004–2014)
Western Mojave, CA	**6,294**	**24.51**	**2.8 (1.0)**	**–50.7 decline**
Fremont-Kramer	2,347	9.14	2.6 (1.0)	**–50.6 decline**
Ord-Rodman	852	3.32	3.6 (1.4)	**–56.5 decline**
Superior-Cronese	3,094	12.05	2.4 (0.9)	**–61.5 decline**
Colorado Desert, CA	**11,663**	**45.42**	**4.0 (1.4)**	**–36.25 decline**
Chocolate Mtn AGR, CA	713	2.78	7.2 (2.8)	**–29.77 decline**
Chuckwalla, CA	2,818	10.97	3.3 (1.3)	**–37.43 decline**
Chemehuevi, CA	3,763	14.65	2.8 (1.1)	**–64.70 decline**
Fenner, CA	1,782	6.94	4.8 (1.9)	**–52.86 decline**
Joshua Tree, CA	1,152	4.49	3.7 (1.5)	+178.62 increase
Pinto Mtn, CA	508	1.98	2.4 (1.0)	**–60.30 decline**
Eastern Mojave, CA	**3,446**	**13.42**	**1.9 (0.7)**	**–67.26 decline**
Ivanpah, CA	2,447	9.53	2.3 (0.9)	**–56.05 decline**

Using line distance sampling data, Defenders of Wildlife prepared a series of graphs showing the population trend of adult desert tortoises from 2001 within CHUs in California, including a line showing the minimum viable density threshold of 3.9 adults per square kilometer, and a projected date of extirpation or extinction (Attachment 1).

An analysis of these data indicate:

- The aggregate adult tortoise densities in the Western Mojave Recovery Unit, Colorado Desert Recovery Unit, and Eastern Mojave Recovery Unit in

California were below the population viability density of 3.9 adult tortoises per km^2.

- At the CHU/TCA/DWMA population level, 9 of the 10 populations in these Recovery Units in California were below this viability density.
- For percent change in population abundance between 2004 and 2014, all populations in the three CHUs/TCAs/DWMAs except one (Joshua Tree National Park) experienced a decline.
- For percent change in population abundance in 2014 using 2004 data as a baseline, the aggregate change in all Recovery Units in California experienced declines ranging from 36 to 67 percent.
- In the Western Mojave Recovery Unit at the population level, the three populations experienced 50 to 61 percent declines.
- In the Colorado Desert Recovery Unit in California, five of six populations experienced 29 to 64 percent declines.
- In the Eastern Mojave Recovery Unit in California, the Ivanpah population experienced a 56 percent decline.
- Only the Joshua Tree population in the Colorado Desert Recovery Unit had an increase in population abundance. Despite this 178 percent increase, its population density was below the 3.9 tortoises per km^2 population viability level.

The population viability analysis in the 1994 Recovery Plan assumed a 1:1 male - female sex ratio and used the estimated densities of tortoises in the early 1990s in the analysis to calculate the population viability density. Unfortunately, we were unable to find information in the USFWS reports on the sex ratios of these populations. Therefore, we are unable to determine if this assumption is being met. A male - female sex ratio that favors males would require a greater population density than 3.9 adult tortoises per square kilometer for a population to be viable.

In addition, the density and abundance of desert tortoises has declined substantially in the Western Mojave Recovery Unit, Colorado Desert Recovery Unit, and Eastern Mojave Recovery Unit since the population viability analysis was published in the 1994 Recovery Plan. Consequently, the minimum viable density for tortoise populations may now be greater than the 3.9 adult tortoises per km^2 (10 adult tortoises per m^{i2}) because population density estimates in the 1990s were used to calculate the population viability density along with other parameters.

In their analysis of the USFWS's 2015 Line Distance Survey Report, Allison and McLuckie (2018) reported:

"*Populations of the Mojave Desert Tortoise (Gopherus agassizii) experienced severe declines in abundance in the decades leading up to 1990, when the species was listed as threatened under the U.S. Endangered Species Act. Prevailing declines in the abundance of adults overall and in four of the five recovery units indicate the need for more aggressive implementation of recovery actions and more critical evaluation of the suite of future activities and projects in tortoise habitat that may exacerbate ongoing population declines. Adult densities in the* [California recovery units] *declined at different annual rates: Colorado Desert (-4.5%, Eastern Mojave*

(-11.2%), and Western Mojave (-7.1%). Of the four recovery units in which we used two-pass surveys, the probability of encountering a juvenile was consistently lowest in the Western Mojave Recovery Unit.

Overall this threatened species is experiencing large, ongoing population declines, and adult tortoise numbers have decreased by over 50% in some recovery units since 2004. Declining adult densities through 2014 have left the Western Mojave adult numbers at 49% and in the Eastern Mojave at 33% of their 2004 levels. Such steep declines in the density of adults are only sustainable if there were suitably large improvements in reproduction and juvenile growth and survival. However, the proportion of juveniles has not increased anywhere since 2007, and in these two recovery units the proportion of juveniles in 2014 has declined to 91% and 77% of their representation in 2004, respectively.

Throughout our assessment, we describe tortoise status based on adult densities, which is useful for comparison of areas of different sizes. However, if the area available to tortoises is decreasing, then trends in tortoise density no longer capture the magnitude of decreases in abundance. Some of the area of potential habitat (68,501 km^2) has certainly been modified in a way that decreases the number of tortoises present.

We used area estimates that removed impervious surfaces created by development as cities in the desert expanded. However, we did not address degradation and loss of habitat from recent expansion of military operations (753.4 km^2 so far on Fort Irwin and the MCAGCC [in addition to training/bombing lands expanded at China Lake Naval Weapons Center]*… the current range-wide distance sampling program provides fairly coarse but clear summaries of patterns in tortoise density and abundance, definitive because they sample regionally and range-wide.*

The negative population trends in most of the TCAs for Mojave Desert Tortoises indicate that this species is on the path to extinction under current conditions. This may reflect inadequate recovery action implementation, slow response by tortoises and their habitat to implemented actions, or new and ongoing human activities in the desert that have not been mitigated appropriately.

It may also be a result of stochastic or directional climatic events that impact large expanses of tortoise habitat (e.g., drought, fire, climate change) and are largely beyond the realm of local land management activities. Our results are a call to action to remove ongoing threats to tortoises from TCAs, and possibly to contemplate the role of human activities outside TCAs and their impact on tortoise populations inside them."

Combining Permanent Study Plots and Line Distance Sampling Results

By the time formal line distance sampling of adult tortoise populations in California began in 2001, high levels of tortoise mortality had been documented and already reduced these populations by up to approximately 90%, such as in the Fremont-Kramer CHU in the Western Mojave Recovery Unit (USFWS 1994a).

As mentioned above, beginning in the 1980s, high tortoise mortality was reported in the three Recovery Units in California. Combining the adult density data from permanent study plots and line distance sampling for these three Recovery Units indicates a substantial long-term downward trend in the density of these desert tortoise populations (Attachment 2).

Agassiz's desert tortoise is a "K-strategist" (MacArthur and Wilson 1967, USFWS 1994a), with delayed maturity and long life under normal conditions. Its survival strategy is to live a long time and recruit a small number of individuals into the population to replenish the loss of adults or slowly increase the population size. However, given the numerous, increasing, and compounding threats to the desert tortoise (see Section 6 "Factors Affecting Ability to Survive and Reproduce") and the long-term downward trend in the density of reproducing adults, these data indicate that adults are not living a long time and recruitment is much lower than mortality. With most population densities in California below the minimum viable density, this long-term downward trend indicates the survival strategy of the desert tortoise has not been working for several decades. Agassiz's desert tortoise is on a path to extirpation in California.

Analyzing the line distance sampling data that spans 19 years, population declines of desert tortoises have been documented since 2001, currently resulting in a breeding adult tortoise density generally below the minimum population viability level of 3.9 tortoises per square kilometer in all but one of the tortoise Critical Habitat Units in California (USFWS 2020). Twenty-five years after the publication of the 1994 Recovery Plan, the USFWS has confirmed that the densities of the 10 tortoise populations in CHUs/TCAs/DWMAs in California are below this minimum viable density, except for the Chocolate Mountains. If the density estimates from line distance sampling in CHUs is below the minimum viable density, it is likely that the occupied habitats outside the CHUs have lower population densities, as Critical Habitat receives an additional regulatory level of management. This would mean that rangewide the density and abundance of the tortoise may not be as great as reported from line distance sampling.

In summary, the permanent study plots data and long-term monitoring data from the USFWS's line distance sampling show a multi-decadal decline in the density of adult desert tortoises in California. The line distance sampling shows the density of 9 of 10 populations of Agassiz's desert tortoise in the CHUs of the California desert are below the population viability density of 3.9 adult tortoises per km^2. All populations have experienced steep declines in abundance since 2004 except the Joshua Tree population. Between 2004 and 2014, nine populations continue to decline at substantial rates. If these rates of decline continue, the trajectory for extirpation of the tortoise in California will likely occur within the foreseeable future. This assumes that factors such as drought and climate change do not become worse and that human uses of desert lands do not increase substantially in the future. Based on past history and regional climate models, we know this is unlikely.

2. **RANGE AND DISTRIBUTION**

In the text, indicate the percentage of historic distribution that is in existence and the rate of loss. If appropriate, indicate the number of extant occurrences, populations or portions of populations in California. Indicate whether the rate of loss is accelerating, and estimate when extinction would occur if current trends continue. Discuss the relationship between historic and current acreage and degree of habitat fragmentation. Describe the quality of the existing habitats in terms of ability to maintain viable populations with or without enhancement.

The following information is from the report published by the USFWS DTRO, entitled "Status and Trend of the desert tortoise and its Critical Habitat in 2019" (USFWS 2019b):

Beginning in the 1970s *"the range and distribution of the Desert tortoise in California was initially mapped using observations of live individuals and their sign collected by the Bureau of Land Management during development of the California Desert Conservation Area Plan. Over 1,000 triangular transects were surveyed between 1978 and 1983 and were used to build a Desert tortoise occurrence map based on five classes of estimated abundance (0-20, 21-50, 51-100, 101-250, > 250 tortoises/mile. Further refinement of the occurrence and relative abundance of Desert tortoises in the Western Mojave Desert was completed by the Bureau of Land Management from 1998-1999 in support of the West Mojave Plan. Approximately 1,800 transects were performed*. *Within its range in California, habitat degradation and loss due to land-use practices include development (urban and rural), military training activities, habitat fragmentation from roads and utility corridors, recreational activities, and livestock grazing."*

In 2009, the US Geological Survey looked at the distribution of the desert tortoise by focusing on available habitat for the species (USFWS 2019b): *"Typical habitat of the desert tortoise in the Mojave Desert is characterized as Creosote Bush Scrub ranging in elevation from approximately 1,000 to 5,500 feet. A key habitat component within this habitat is a reliable food source in the form of annual forbs and grasses, which rely on annual precipitation ranging from approximately 2-8 inches. Based on an evaluation of environmental variables associated with occupied Desert tortoise habitat, U.S. Geological Survey researchers developed a habitat suitability model in 2009* (Nussear et al. 2009), *which provided the first accurate map of predicted occupied habitat for the species.*

The most apparent threats to the desert tortoise are those that result in mortality and permanent habitat loss across large areas, such as urbanization and large-scale renewable energy projects and those that fragment and degrade habitats, such as proliferation of roads and highways, off-highway vehicle (OHV) activity [including military training], wildfire, and habitat invasion by non-native invasive plant species.

Prior to 1994, desert tortoises were extirpated from large areas within their distributional limits by urban and agricultural development (e.g., the cities of Barstow and Lancaster, California; Las Vegas, Nevada; and St. George, Utah; etc.; agricultural areas south of Edwards Air Force Base and east of Barstow), military training (e.g., Fort Irwin, Leach Lake Gunnery Range), and off-highway vehicle use (e.g., portions of off-road management areas managed by the BLM and

unauthorized use in areas such as east of California City, California). Since 2010, the U.S. Fish and Wildlife concluded that the distribution of the Desert tortoise had not changed substantially in terms of the overall extent of its range, although desert tortoises have been removed from several thousand acres because of solar development, military activities, and other project development (USFWS 2010). In 2014, the U.S. Fish and Wildlife Service accounted for acres of non-habitat for the species (i.e., impervious surfaces that included paved and developed areas and other disturbed areas that have zero probability of supporting desert tortoises. Within California, impervious surfaces totaled 3,325,979 acres, or 19.2% of the total acres of modeled habitat for the species.

Other anthropogenic factors affect the physical and biological features of critical habitat in more subtle ways. Surface disturbance from OHV vehicle activity can cause erosion and large amounts of dust to be discharged into the air. Recent studies on surface dust impacts on gas exchanges in Mojave Desert shrubs showed that plants encrusted by dust have reduced photosynthesis and decreased water-use efficiency, which may decrease primary production during seasons when photosynthesis occurs.

Sharifi et al. (1997) also showed reduction in maximum leaf conductance, transpiration, and water-use efficiency due to dust. Leaf and stem temperatures were also shown to be higher in plants with leaf-surface dust. These effects may also impact [native] desert annuals, an important food source for desert tortoises.

Invasion of non-native plants can affect the quality and quantity of plant foods available to desert tortoises. Increased presence of invasive plants can also contribute to increased fire frequency. Proliferation of invasive plants is increasing in the Mojave and Sonoran deserts and is recognized as a substantial threat to desert tortoise habitat."

Substantial alteration of Agassiz's desert tortoise Critical Habitat occurred with the expansion of the U.S. Army's National Training Center at Fort Irwin in 2002, 13 years after listing of the species as Threatened by the California Fish and Game Commission. This federal action resulted in the transfer of approximately 99,000 acres of public land managed by the BLM in the Superior-Cronese Critical Habitat Unit of the Western Mojave Recovery Unit in California to the U.S. Army. (Charis 2005). The Army is now conducting mechanized warfare training, which directly impacts tortoise habitat, on approximately 18,000 of these acres in the Southern Expansion Area, and indirectly impacts additional habitat by creating large amounts of dust that are deposited in adjacent and downwind areas. The dust covers plants and reduces their ability to photosynthesize. It also reduces maximum leaf conductance, transpiration, and water-use efficiency (Sharifi et al. 1997). Thus, plant survival, growth, and reproduction are reduced. This reduces the availability of important forage plants (USFWS 2010) and cover for the tortoise from predators and temperature extremes. Military training activities spread the seeds and plant propagules of nonnative plant species in the tracks and tires of their vehicles and in their equipment. The remaining 62,000 acres of Critical Habitat in the Western Expansion Area have not been used for mechanized training to date, but the Army intends to utilize them at some future date (USFWS 2012a).

Prior to use of the 18,000 acres in the Southern Expansion Area, the Army in 2002 captured a total of 650 adult and sub-adult desert tortoises and translocated them to specific non-training lands within and adjacent to the installation. Roughly half of tortoises translocated died during or immediately after translocation. To date, tortoises have only been removed from the Southern Expansion Area where mechanized warfare training takes place (USFWS 2012a). Surveys in the 62,000 acre Western Expansion Area revealed that approximately 1,100 individuals would have to be captured and translocated before mechanized training could commence.

A second significant impact to Agassiz's desert tortoise habitat occurred in 2013, when the U.S. Navy expanded the U.S. Marine Corps Air Ground Combat Center (MCAGCC) into the eastern Johnson Valley by acquiring 154,000 acres of public land managed by the BLM and 13,971 acres of non-federal land (U.S. Marine Corps et al. 2016). Approximately 1,000 desert tortoises were captured and translocated from the area planned for active mechanized warfare training exercises into the adjacent Ord-Rodman CHU. The same direct and indirect impacts to tortoises and tortoise habitat from the National Training Center's expansion also occurred on the expansion lands of MCAGCC.

Between 2009 and 2019, ten solar energy generation projects were also approved on public lands supporting Agassiz's desert tortoise habitat in California, 20 years following state listing of the species as Threatened. As a result, a total of 31,578 acres of Agassiz's desert tortoise habitat on public land has been removed during this time, although none of these projects are located in Critical Habitat. Additional private land with significant tortoise habitat have also been developed for renewable energy projects. The estimated incidental take of Agassiz's desert tortoises for these projects total over 2,298 individuals to date, based on USFWS biological opinions and CESA Section 2081 incidental take permits. Authorization for additional incidental take in the future is anticipated due to continued development of solar energy facilities, primarily on federal land managed by the BLM.

Roads have been described as the single most destructive element in the process of habitat fragmentation (Noss 1993) and their ecological effects are considered "the sleeping giant of biological conservation" (Forman 2002:viii, as cited in van der Ree et al. 2011). Though roads comprise only 1% of surface area, an estimated 19% of the total land within the United States is ecologically affected by roads due to indirect effects that extend beyond the physical footprint of the road (Forman, 2000, as cited in Nafus et al. 2013).

There are approximately 15,000 miles of paved and maintained roads within the range of the Agassiz's desert tortoise in California (BLM 1999); and 5,997 miles of authorized off-highway vehicle routes within the western Mojave Desert (BLM 2005, 2019). These roads and routes and their use by vehicles have numerous adverse impacts on the desert tortoise and its habitat. They include (1) wildlife mortality from collisions with vehicles, collecting, and vandalism (McLellan and Shackleton 1988, Kilgo et al. 1998) (2) hindrance/barrier to animal movements thereby reducing access to resources and mates [fragmentation], (3) degradation of habitat quality [spread of non-native invasive plant species] (Parendes and Jones 2000), (4) habitat loss

caused by disturbance effects in the wider environment and from the physical occupation of land by the road, and (5) subdividing animal populations into smaller and more vulnerable fractions (at higher risk of localized extirpation from stochastic events or from inbreeding depression) (Jaeger et al. 2005a, 2005b, Roedembeck et al. 2007) (USFWS 1994a, Boarman 2002). A summary of the miles of routes and disturbed areas associated with motorized vehicle use within CHUs in the Western Mojave Recovery Unit is provided in Attachment 3.

For a herbivorous species such as the desert tortoise, roadside vegetation is often more robust and diverse because water that becomes concentrated along roadside berms promotes germination. This attracts tortoises and puts them at higher risk of mortality as road-kill (Boarman et al. 1997).

LaRue (1993) and Boarman et al. (1997) reported observing depauperate desert tortoise populations along highways. Subsequent research shows that populations may be depressed in a zone at least as far as 0.4 kilometers (0.25 miles) from the roadway on each side (Boarman and Sazaki 1996). The greater the distance from the road, the more desert tortoise sign is observed (LaRue 1993; Boarman et al. 1997; von Seckendorff Hoff and Marlow 2002; Boarman and Sazaki 1996). Similarly, the cover and richness of non-native plant species decreases as distance from the road increases (Boarman and Sazaki 1996).

In summary, the distribution of Agassiz's desert tortoise has been shrinking since its listing as threatened because of the myriad of land use projects throughout much of the tortoise's range in California. The larger individual projects (e.g., the expansion of the National Training Center at Fort Irwin and MCAGCC, and numerous large-scale renewable energy projects) and collectively, smaller development projects in/near the growing cities/communities of Palmdale-Lancaster, Victorville-Hesperia-Adelanto-Apple Valley, and Barstow-Lenwood continue to reduce the distribution of the tortoise near these communities. Thousands of miles of roads and routes of travel crisscross desert tortoise habitat effectively eliminating tortoises from thousands of acres of habitats adjacent to their corridors and fragment tortoise populations.

3. **ABUNDANCE**

Provide available historic and current population estimates/trends, densities, vigor, sex and age structures, and explain population changes relative to human-caused impacts or natural events. Compare current and historic abundance in terms of overall population size or size of occurrences, populations or portions of populations, as appropriate. Describe current population trends (with numbers and rate) and relate these to viable population numbers. Explain survey methodology used to arrive at numbers or estimates and what assumptions, if any, were involved.

As stated above in the Executive Summary and Section 1 (Population Trends), adult tortoise populations in Recovery Units in California have declined by 51.3% from 2004 through 2014 (i.e., from 119,029 tortoises in 2004 to 65,726 tortoises in 2014) (USFWS 2015). These declines were within tortoise Critical Habitat Units where there is a higher level of habitat protection expected to occur compared to lands outside these areas.

Densities of adult tortoises in CHUs within the Western Mojave Recovery Unit were estimated in 2004 to average 5.7 tortoises per square kilometer, in contrast to an average density of 2.8 tortoises per square kilometer estimated in 2014 – a decline similar to those occurring in all three Recovery Units in California (USFWS 2015). Historical survey data from permanent study plots in the Western Mojave Recovery Unit in the late 1970s and early 1980s were used to estimate adult tortoise densities in the 1994 Recovery Plan, which ranged from 2 to 96 per square kilometer at that time (USFWS 1994a) – indicating that adult tortoises in the Western Mojave Recovery Unit may have declined by as much as 85-95% from roughly 1980 to 2014. During this time Agassiz's desert tortoise had been state-listed as Threatened for 15 years.

These trend data indicate that under current management, Agassiz's desert tortoise populations within Critical Habitat Units in California continue to decline rapidly, which is inconsistent with the goals in the Recovery Plans of stabilizing and recovering depleted tortoise populations and halting habitat degradation – a situation that endangers the continued viability of wild tortoise populations in California. Still higher tortoise population declines, and greater degrees of habitat degradation, are known to occur outside of these Critical Habitat Units, possibly due to less restrictions placed on various public land use activities and private land development through regional and county land use plans [e.g., California Desert Conservation Area (CDCA) Plan (BLM 1980), as amended by the Desert Renewable Energy Conservation Plan (DRECP)].

Darst et al. (2013) developed a tortoise threats assessment that ranked the relative importance of threats to Agassiz's desert tortoise and its populations. These researchers determined that urbanization, human access, military operations, disease, and illegal use of off-highway vehicles were, and continue to be, the most significant threats on a range-wide basis.

In the 1994 rule designating Critical Habitat for the Mojave population of the desert tortoise, the USFWS (1994b) stated:

"*OHV use in the desert has increased and proliferated since the 1960s. As of 1980, OHV activities affected approximately 25 percent of all desert tortoise habitat in California*."

Various researchers have studied threats to tortoises and their populations. Tuma et al. (2016) conducted a detailed analysis of threats present in the Superior-Cronese Critical Habitat Unit in the Western Mojave Recovery Unit in California. These researchers concluded human presence was associated with significantly greater declines in tortoise populations because it was associated with habitat degradation and higher animal mortality on a continuous basis. This conclusion was reached even though human presence had a patchy distribution in the study area. Land use activities, such as vehicle use on/off authorized roads/trails, camping, mining, and livestock grazing; as well as habitat loss associated with housing subdivisions, freeways, transmission lines and railroads were identified in this study as a current suite of threats to Agassiz's desert tortoise. The second highest-ranked threat was

subsidized predators, which contribute to tortoise mortality on a continuous, widespread basis but without causing habitat loss or degradation.

The USFWS (2011) concluded in its revised recovery plan for the Mojave Population of the Desert Tortoise that:

"*The vast majority of threats to the desert tortoise or its habitat are associated with human land uses. The threats identified in the 1994 Recovery Plan formed the basis for listing the tortoise as a threatened species and continue to affect the species today*."

As stated in Section 1 ("Population Trends"), the USFWS (1994) has determined the minimum viable density of adult tortoises is 3.9 tortoises per square kilometer, and that populations with densities below this number are in danger of extirpation. Based on extensive (2001-2014) line distance sampling, the USFWS (2015) determined that the estimated density of adult tortoises within Critical Habitat within the Western Mojave Recovery Unit in California in 2014 had declined to 2.8 tortoises per square kilometer, which is below the minimum density to ensure population viability or persistence. For the Colorado Desert Recovery Unit, the estimated density of adult tortoises was 4.0 tortoises per square kilometer. Although just above the minimum viable density of 3.9 calculated for desert tortoises in 1994, this CHU had a declining trend of 36.25 % from 2004 to 2012. This declining trend likely means that the density of adult tortoise will be below the minimum viable density in the foreseeable future. The Eastern Mojave Recovery Unit in California had an estimated adult tortoise density of 2.3 tortoises per square kilometer and the estimated density for the entire Recovery Unit in California and Nevada was 1.9 tortoises per square kilometer. Like the Colorado Desert Recovery Unit, the Western Mojave and Eastern Mojave Recovery Units had declining trends of 50.7% and 63.7%, respectively (see Table 3 in Section 1 – "Population Trends"). Tortoise densities in 8 of 10 Critical Habitat Units in California are also below minimum viability (see Table 3 in Section 1 – "Population Trends").

In addition to these threats, there is the overarching threat of climate change. Regional climate change models for the southwest United States show that the area is already experiencing the effects of climate change. The average daily temperatures for the 2001–2010 decade were the highest in the southwestern United States from 1901 through 2010 (Overpeck et al. 2012) with temperatures almost 2.0 degrees Fahrenheit (1.1 degrees Celsius) higher than historic averages, with fewer cold snaps and more heat waves (Overpeck et al. 2012). Climate change models for the southwestern United States for the 21st century predict seasonal air and surface temperatures in all seasons will increase (Overpeck et al. 2012), with greater warming in summer and fall than winter and spring. Droughts in parts of the southwestern United States are projected to become greater in intensity (Overpeck et al. 2012) (i.e., more frequent and/or longer in duration) with a precipitation decrease westward through the Sonoran and Mojave Deserts. With precipitation decreasing as one moves farther west in the southwest U.S., this would mean that the western portion of the range of Agassiz's desert tortoise (i.e., the tortoises in California) would be most affected by this decrease in precipitation from climate change.

Perennial vegetation is being impacted by prolonged drought conditions in the Mojave Desert. The negative effects of long-term drought on Sonoran, Great Basin, and Mojave Desert perennial plants are well documented (Goldberg and Turner 1986; Turner 1990; Bowers 2005; Hereford et al. 2006; Miriti 2006; Hamerlynck and McAuliffe 2008; Hamerlynck and Huxman 2009; Ralphs and Banks 2009, as cited in Huggins et al. 2010), and include high shrub mortality, shrub canopy deterioration, and low plant recruitment.

In a portion of the Superior-Cronese CHU, die-offs of desert shrubs have been documented. Data from plant transects reveal that total shrub cover and volume have decreased significantly by roughly 10% between 2000 and 2009 (Huggins et al. 2010). Mortality of these long-lived shrubs has been high (48%), and the recruitment of new shrubs (5%) has been too low to maintain their populations at previous levels (Huggins et al. 2010).

If the climate models for the Southwest and Mojave and Colorado deserts are correct, as the westernmost deserts in the southwest, their drought periods will become longer and more frequent. These climatic conditions will result in reduced reproduction and recruitment and elevated mortality of native woody perennial vegetation needed by the desert tortoise for shelter from extreme weather conditions and cover from predators. It also means that the frequency and quantity of native annual and herbaceous perennial plants needed by the tortoise for adequate nutrition (see Section 5 “Kind of Habitat Necessary for Survival”) would be reduced further. Reductions in precipitation and availability of forage plants for tortoises would result in reduced tortoise survival, reproduction, and recruitment (Henen 1997; Henen 2002a; Henen 2002b; and Wallis et al. 1999) and reduced tortoise densities and abundance). Because 9 of the 10 tortoise populations in the three Recovery Units in California are below the population viability threshold, the tortoise cannot persist if its survival, reproduction, or recruitment will be reduced. The tortoise’s downward trend toward extirpation will continue.

Based on the best available scientific information (presented above), Agassiz’s desert tortoise is in danger of extirpation in Critical Habitat Units in California from a variety of human-related threats. Because line distance sampling represents estimates of desert tortoise densities and abundance rangewide, the data and analysis from line distance sampling shows that Agassiz’s desert tortoise is in danger of extirpation in the three Recovery Units in California - the Western Mojave Recovery Unit, the Colorado Desert Recovery Unit, and the Eastern Mojave Recovery Unit.

Defenders of Wildlife, the Desert Tortoise Council and the Desert Tortoise Preserve Committee believe changing the regulatory status of Agassiz’s desert tortoise from Threatened to Endangered under CESA provisions will result in a higher level of impact analyses for proposed land use activities and greater long-term protection of occupied habitats. Mitigation requirements to avoid, minimize, and compensate for adverse impacts under Endangered vs. Threatened status would likely be greater and more effective in halting population declines and habitat loss/degradation, and in

contributing to recovery of the species. Funding available for conservation projects for recovery of Endangered vs. Threatened species would also likely be greater.

4. LIFE HISTORY (SPECIES DESCRIPTION, BIOLOGY, AND ECOLOGY)

Include pertinent information that is available on species identification, taxonomy and systematics, seasonal activity or phenology, reproductive biology, mortality/natality, longevity, growth rate, growth form, food habits, habitat relationships and ecological niche or ecological attributes, interactions with other species or special habitat requirements that may increase vulnerability of the species to certain natural or human-caused adverse impacts (e.g., obligate wetland or riparian habitat species, low birthrate, colonial species).

This information is available in the supporting documents for the 1989 listing of the desert tortoise as Threatened by the Commission, as well as in the supporting documents for federal listing as Threatened by the USFWS. Additional information is available in the 1994 Recovery Plan (USFWS 1994a) and the 2011 Revised Recovery Plan (USFWS 2011). A summary is provided below from the Status of the Desert Tortoise (USFWS 2019b) and Andersen et al. (2000), and the two desert tortoise recovery plans.

The desert tortoise is a large, herbivorous reptile that reaches 20 to 38 centimeters (8 to 15 inches) in carapace (upper shell) length and 10 to 15 centimeters (4 to 6 inches) in shell height. Hatchlings emerge from eggs at about 5 centimeters (2 inches) in length. During the first 5 to 7 years of life, the tortoise shell is incompletely ossified; it is soft and easy to puncture and rip open (Boarman 2002). This makes small tortoises highly vulnerable to predation by a variety of mammals and birds. Adult desert tortoises weigh 3.6 to 6.8 kilograms (8 to 15 pounds). The forelimbs have heavy, claw-like scales and are flattened for digging. Hind limbs are more elephantine (Ernst et al. 1994).

Desert tortoise behavior is well adapted to living in a highly variable and often harsh desert environment. They spend much of their lives in burrows that they excavate, even during their seasons of activity. Burrows are made under rocks or in soil and may be as much as 5 m in length but are usually 1 m deep (Burge 1978, Bulova 1994). Patterns of burrow use are sex specific (Bailey et al. 1995) and may reflect complex social interactions among individual tortoises (Bulova 1994). Burrow living can make tortoises difficult to find, particularly in drought years when the animals seal themselves behind a wall of dirt and stay underground to conserve water.

In late winter or early spring, they emerge from overwintering burrows and typically remain active through fall. Activity decreases in summer, but tortoises often emerge after summer rain storms to drink (Henen et al. 1998). During activity periods, desert tortoises eat a wide variety of herbaceous vegetation, particularly perennial grasses and the flowers of annual plants (Berry 1974; Luckenbach 1982; Esque 1994). Tortoises are selective in the plant species and plant parts that they eat. Oftedal et al. (2002) reported that plant species and plant parts of species eaten by desert tortoises were higher in water, protein, and potassium excretion potential (PEP), and lower in potassium than uneaten species and parts. During periods of inactivity, they reduce

their metabolism and water loss and consume very little food by remaining in their burrows. Adult desert tortoises lose water at such a slow rate that they can survive for more than a year without access to free water (obtaining it from their food, if available) and can apparently tolerate large imbalances in their water and energy budgets (Nagy and Medica 1986; Peterson 1996; Henen et al. 1998) at least for a limited time.

Desert tortoises are essentially “K-strategists” (MacArthur and Wilson 1967), with delayed maturity and long life. Eggs and hatchlings are quite vulnerable, and pre-reproductive adult mortality averages 98% (Wilbur and Morin 1988, Turner et al. 1987). Adults, however, are well protected against most predators (other than humans) and other environmental hazards and consequently can be long-lived (Germano 1992, Turner et al. 1987). Their longevity helps compensate for their variable annual reproductive success, which is correlated with environmental conditions.

Mating occurs both during spring and fall (Black 1976; Rostal et al. 1994). In drought years, the availability of surface water following rains may be crucial for desert tortoise survival (Nagy and Medica 1986). During these unfavorable periods, desert tortoises decrease surface activity and remain mostly inactive or dormant underground (Duda et al. 1999), which reduces water loss and minimizes energy expenditures (Nagy and Medica 1986). Duda et al. (1999) showed that home range size, number of different burrows used, average distances traveled per day, and levels of surface activity were significantly reduced during drought years.

The size of desert tortoise home ranges varies with respect to location and year (Berry 1986) and also serves as an indicator of resource availability and opportunity for reproduction and social interactions (O’Connor et al. 1994). Females have long-term home ranges that may be as little or less than half that of the average male, which can range to 80 or more hectares (200 acres) (Burge 1977; Berry 1986a; Duda et al. 1999; Harless et al. 2009). Core areas used within tortoises’ larger home ranges depend on the number of burrows used within those areas (Harless et al. 2009). Over its lifetime, each desert tortoise may use more than 3.9 square kilometers (1.5 square miles) of habitat and may make periodic forays of more than 11 kilometers (7 miles) at a time (Berry 1986).

Tortoises are long-lived and grow slowly, requiring 13 to 20 years to reach sexual maturity, and have low reproductive rates during a long period of reproductive potential (Turner et al. 1984; Bury 1987; Germano 1994). Growth rates are greater in wet years with higher annual plant production (e.g., desert tortoises grew an average of 12.3 millimeters [0.5 inch] in an El Niño year compared to 1.8 millimeters [0.07 inches] in a drought year in Rock Valley, Nevada (Medica et al. 1975). The number of eggs as well as the number of clutches that a female desert tortoise can produce in a season is dependent on a variety of factors including environment, habitat, availability of forage and drinking water, and physiological condition (Turner et al. 1986, 1987; Henen 1997; McLuckie and Fridell 2002). The success rate of clutches has proven difficult to measure, but predation, while highly variable (Bjurlin and Bissonette 2004), appears to play an important role in clutch failure (Germano 1994).

Although Agassiz's desert tortoise occurs from the western Mojave Desert in California east to southwestern Utah, it consists of populations that show differences in genetics, morphology, ecology, and behavior (USFWS 2011). The USFWS used differences in genetic, ecological, and physiological characteristics to help delineate boundaries or other differences between Recovery Units. The designation of Recovery Units ensures that local adaptation as well as critical genetic diversity are maintained for Agassiz's desert tortoise (USFWS 2011). Hence, there are three Recovery Units for the desert tortoise in California.

5. **KIND OF HABITAT NECESSARY FOR SURVIVAL**

Describe habitat features that are thought to be important to the species' ability to maintain viable population levels. Any or all of the following features may be included, as appropriate:

Plant community; edaphic conditions; climate; light; topography/microtopography; natural disturbance; interactions with other plants or animals; associated species; elevation; migration or movement corridors; wintering habitat; breeding habitat; foraging habitat; other habitat features.

Suitable habitat for the species has been previously described in a U.S. Geological Survey (USGS) tortoise habitat model, as cited above in this Petition. However, we are providing a description of habitat characteristics below (from Nussear 2009, USFWS 1994a, USFWS 1994b, and USFWS 2011).

The habitat requirements of Agassiz's desert include sufficient suitable quantity and quality of plants for forage and cover, suitable substrates for burrow and nest sites, and low occurrence of predators. Throughout most of the Mojave region, desert tortoises occur primarily on flats and bajadas with soils ranging from sand to sandy-gravel, characterized vegetationally by scattered shrubs and abundant inter-shrub space for growth of herbaceous plants. Desert tortoises are also found on rocky terrain and slopes in parts of the Mojave region, and there is significant geographic variation in the way desert tortoises use available resources.

In the Mojave Desert, annual precipitation within known habitat ranges from 100 to 210 mm (Germano et al. 1994), mostly occurring during the winter months (> 50-75%) and infrequently as snow below 1,200 m. The temperature range within known habitat is extreme, with average daily low temperatures in January typically at or slightly below 0 ºC and average daily high temperatures in July ranging from 37 to 43 ºC (Germano et al. 1994).

In California, the desert tortoise uses the following vegetation communities:

- In the Colorado Desert Recovery Unit, vegetation communities include Succulent Scrub *(Fouquieria, Opuntia, Yucca),* Blue Palo Verde-Smoke Tree Woodland, Creosote Bush Scrub (lava flows), Blue Palo Verde-Ironwood-Smoke Tree Woodland, and Creosote Bush Scrub (rocky slopes).
- In the Eastern Mojave Recovery Unit, vegetation communities include Big Galleta-Scrub Steppe, Succulent Scrub *(Yucca, Opuntia* species), Creosote

Bush Scrub, Cheesebush Scrub (east Mojave type), and Indian Rice Grass Scrub-Steppe.

- In the Western Mojave Desert, vegetation communities include Mojave Saltbush- Allscale Scrub (endemic), Indian Rice Grass Scrub-Steppe, Hopsage Scrub, Big Galleta Scrub Steppe, Cheesebush Scrub (west Mojave type), Desert Psammophytes, and Blackbush Scrub.

The USFWS has determined that the physical and biological features (referred to as the primary constituent elements) of critical habitat that support nesting, foraging, sheltering, dispersal, and gene flow are essential to the conservation of the desert tortoise. The specific physical and biological features of Mojave desert tortoise critical habitat are:

- sufficient space to support viable populations within each of the recovery units and to provide for movement, dispersal, and gene flow;
- sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species;
- suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and
- habitat protected from disturbance and human-caused mortality.

Forage quantity and quality is limited in the range of the Mojave desert tortoise. In the Mojave and Colorado deserts, many food plants are high in potassium (Minnich 1979), which is difficult for desert tortoises to excrete due to the lack of salt glands that are found in other reptilian herbivores such as chuckwallas (*Sauromalus obesus*) and desert iguanas (*Dipsosaurus dorsalis*) (Minnich 1970; Nagy 1972). Reptiles are also unable to produce concentrated urine, which further complicates the ability for desert tortoises to expel excess potassium (Oftedal and Allen 1996). Oftedal (2002) suggested that desert tortoises may be vulnerable to disease as a result of physiological stress associated with foraging on food plants with insufficient water and nitrogen to counteract the negative effects of dietary potassium. Only high quality food plants (as expressed by the Potassium Excretion Potential, or PEP, index) allow substantial storage of protein (nitrogen) that is used for growth and reproduction, or to sustain the animals during drought. Non-native, annual grasses have lower PEP indices than most native forbs (Oftedal 2002; Oftedal et al. 2002). Oftedal et al. (2002) found that foraging juvenile tortoises favored water-rich, high-PEP, native forbs. Much of the nutritional difference between available and selected forage was attributable to avoidance of abundant, non-native split grass (*Schismus* spp.) with mature fruit, which is very low in water, protein, and PEP. Of the species eaten, *Camissonia claviformis*, a native Mojave desert primrose, accounted for nearly 50 percent of all bites, even though it accounted for less than 5 percent of the biomass encountered, and was largely responsible for the high PEP of the overall diet. Impacts to vegetation (such as livestock grazing, invasion of non-native plants [from use of roadways], and soil disturbance) that reduce the abundance and distribution of high PEP plants may result in additional challenges for foraging desert tortoises (Oftedal et al. 2002).

Non-native grasses are not as nutritious as native forbs. Recent studies have shown that calcium and phosphorus availability are higher in forbs than in grasses and that desert tortoises lose phosphorus when feeding on grasses but gain phosphorus when eating forbs (Hazard et al. 2010).

As previously stated in Section 1 “Population Density,” for the desert tortoise to survive and recover, its habitat should be managed with reserve level protection (USFWS 1994a). A reserve has a primary goal of protecting biodiversity from harmful activities and processes, both natural and anthropogenic. Thus, reserve level protection for Agassiz’s desert tortoise requires substantially reducing the direct and indirect impacts to the tortoise and its habitats that cause/contribute to its mortality and its recruitment if lambda is less than 1. Section 6 “Factors Affecting the Ability to Survive and Reproduce” includes a figure of the human-caused impacts to the habitat of the desert tortoise that results in mortality.

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;
(2) overexploitation;
(3) predation;
(4) competition;
(5) disease; or
(6) other natural events or human-related activities.

Identify the direct, indirect, and cumulative adverse impacts and discuss how these are contributing to the decline of the species. Indicate whether the species is vulnerable to random catastrophic events.

Information on these factors (e.g., habitat modification/destruction, predation, disease, etc.) has been provided in the above responses. A summary of these anthropomorphic threats and their interactions is provided in Figure 2 (below).

In addition, the desert tortoise is vulnerable to catastrophic events such as wildfire and flooding. Wildfire threat has increased dramatically over the past 100 years due to colonization of tortoise habitat by invasive, non-native species such as cheatgrass (*Bromus tectorum*), red brome (*Bromus madritensis* ssp. *rubens*) and Mediterranean splitgrass (*Schismus barbatus*). These annual grasses germinate early, compete with and displace native species of forbs and grasses for moisture and nutrients (Brooks 1999a, Brooks 1999b).

These non-native plants also form a dense and expansive layer of dry plant material in shrub communities at the end of the growing season that is highly flammable – substantially contributing to an area’s wildfire fuel load. Affected native plant communities can sometimes recover from wildfire over an extensive time period; but many become type-converted to a flammable grass community following intense fire,

resulting in a modified tortoise habitat of generally low quality which generally lacks constituent elements of this species' native habitat (Brooks and Esque 2002, Brooks and Matchett 2003).

While flooding due to intense monsoon thunderstorms is relatively common in the eastern half of the species range in California, and rare in the western half, recent climate models predict that more frequent and intense thunderstorms are anticipated over time as a result of climate change. Overall rainfall is expected to decrease, but intense storms will likely become more common. Three climate model projections for the California Desert region show increased precipitation during winter months over the entire area, but one model predicts the greatest rainfall increase in winter and also a large increase in summer precipitation. One climate change model projects increasing precipitation throughout the 21st century with a much wetter future overall despite a decline in spring and, to a lesser extent, fall rains (Bachelet et al. 2016).

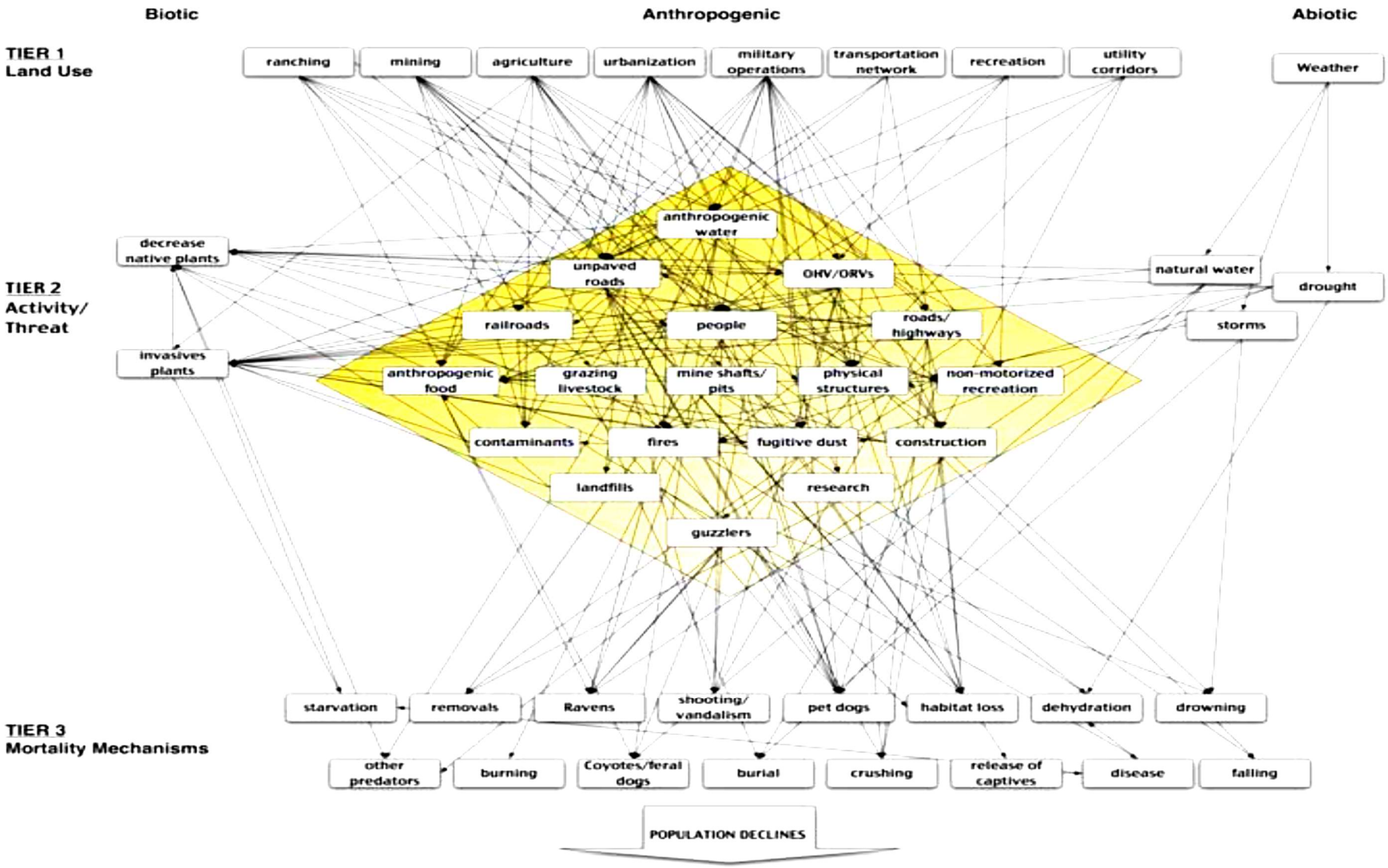


Figure 2. Network of threats demonstrating the interconnectedness between multiple human activities that interact to adversely impact tortoise populations. Tier 1 includes the major land use patterns that facilitate various activities (Tier 2) that impact tortoise populations through a suite of mortality factors (Tier 3). (From Tracy et al. 2004)

7. **DEGREE AND IMMEDIACY OF THREAT**

Indicate the immediacy of the threat and the magnitude of loss or rate of decline that has occurred to the present or is expected to occur without protective measures.

Desert tortoise populations in California have declined by approximately 90% since surveys were initially conducted starting in 1975, and also declined by over 50% since line-distance sampling began in 2004. Nine out of 10 populations in critical habitat units are now below the minimum viable density of adult tortoises (3.9/km^2 or 10/mi^2), and the steep population declines are continuing. This situation results in populations that have little or no resilience to stochastic events (e.g., drought, disease, fire, etc.) and are likely to become extinct in the foreseeable future.

Additional protective measures need to be implemented immediately to prevent desert tortoise populations from becoming extinct in California. Conservation and recovery actions funded and implemented to date have proven ineffective as demonstrated through line-distance sampling and the annual reports published by the Desert Tortoise Recovery Office. There is an urgent need to ensure the survival of adult tortoises, and especially reproductive females, so that populations can slowly recover; and to drastically reduce loss of hatchling and immature individuals due to predation by excessive raven populations.

Detailed information on threats to Agassiz's desert tortoise are described above in Sections 1 ("Population Trends"), 2 ("Range and Distribution"), 3 ("Abundance") and 6 ("Factors Affecting Ability to Survive and Reproduce").

8. **IMPACT OF EXISTING MANAGEMENT EFFORTS**

Describe any ongoing protective measures or existing management plans for the species or its habitat. Information on species or land management activities that are impacting populations or portions of the range and information on proposed land-use changes should be included. This may be best accomplished by discussing populations or portions of the range, where a chart display may be useful.

Include available information on any or all of the following:

> *(1) property ownership/jurisdiction for known populations or portions of the range;*
>
> The following information on property ownership/jurisdiction for populations of the desert tortoise in California is from the USFWS Federal Register Notice on designation of critical habitat (USFWS 1994B) and additional land acquisition and jurisdictional changes occurring after 1994:
>
> 4,754,000 acres of critical habitat was designated in California with the following ownership/jurisdictions and acreage:
>
> - BLM: 2,968,300 acres
> - National Park Service: 828,000 acres

- Department of Defense: 450,200 acres
- State of California: 132,900 acres
- Private: 1,051,500 acres

Current and historic desert tortoise habitat loss, deterioration, and fragmentation is largely attributable to urban development, military operations, and multiple-uses off public land, such as off-highway vehicle (OHV) activities and livestock grazing.

(2) current land use;

Federal land managed by the BLM: These federal lands are managed by BLM under provisions in the CDCA Plan, most recently amended by the DRECP and the West Mojave Plan, and are managed to provide a variety of multiple uses including livestock grazing, utility rights of way, livestock grazing, OHV use, wildlife habitat management, wilderness and wild and scenic rivers. The CDCA Plan prohibits or restricts some lands uses within desert tortoise conservation areas, such as renewable energy projects and pipelines, but the plan has been amended many times to allow for these uses to occur. We anticipate that the BLM will propose to significantly diminish biological resources conservation lands and conservation actions in the near future when it releases an amended DRECP.

Federal land managed by the National Park Service: These federal lands are located within the Mojave National Preserve and Joshua Tree National Park. They are managed under provisions of General Management Plans, which emphasize natural and cultural resources protection.

Lands managed by the State of California: These lands are managed primarily by the California Department of Parks and Recreation and state parks and preserves, and by the California Department of Fish and Wildlife as State Wildlife Areas and State Ecological Reserves. High quality habitat for the desert tortoise occurs in the Western Mojave and Fremont Valley Ecological Reserves. The are managed for conservation with limited public use allowed, but unauthorized OHV use frequently occurs due to limited law enforcement capability.

Federal land managed by the Department of Defense: These federal lands are located within four large installations (China Lake Naval Air Weapons Station, Edwards Air Force Base, Fort Irwin, the Marine Corps Air Ground Combat Center, and the Chocolate Mountains Gunnery Range). They are used primarily for weapons development and testing, aircraft testing and research, and military training. Natural resources within these installations, including the desert tortoise, are managed under provisions of Integrated Natural Resource Management Plans.

Private lands: Private lands designated as critical habitat are typically interspersed among federal lands managed by the BLM and National Park Service. They are managed by local agencies under county General Plans for a variety of land uses that include residential development, agriculture, open space, mining, etc. Activities that would impact the desert tortoise or adversely modify critical habitat would require the project proponent to obtain an incidental take permit from the

CDFW and USFWS, the latter of which would require preparation and implementation of a Habitat Conservation Plan.

(3) protective measures being taken, if any, and effectiveness of current management activities;

Federal lands have a variety of protective measures in place to minimize or compensate for adverse impact to the desert tortoise and its habitat. The most protective measures are associated with National Park Service General Management Plans for the Mojave National Preserve and Joshua Tree National Park where conservation of natural and cultural resources is paramount. However, with high public visitation, these park units have experienced loss of desert tortoises due to mortality due to vehicle strikes. Speed limit signing and law enforcement patrols have had little effect in reducing threats due to vehicle strikes.

Department of Defense lands have a wide range of effects on the desert tortoise and its habitat. Installations used for large-scale mechanized training and live-fire of weapons (e.g., Fort Irwin and the Marine Corps Air Ground Combat Center) have resulted in loss and fragmentation of habitat and loss of tortoise hatchlings and juveniles that were not detected during capture and translocation operations. However, activities at the China Lake Naval Air Weapons Station and Edwards Air Force Base typically do not disturb significant amounts of habitat because their weapons development and testing activities occur within designated military airspace, with very limited use of habitat for weapons impact sites.

In order to minimize direct mortality of desert tortoises from large-scale projects, such as solar energy generation facilities, the CDFW and USFWS typically require that desert tortoises be captured and translocated to secured habitat as close to the site as possible, and that the project site be fenced to prevent tortoises from entering the facility. Translocation is considered an experimental technique to minimize mortality, but it has undergone improvements over time, resulting in higher levels of tortoise survival following translocation in the short-term. Long term effects are being studied. Short-term adverse impacts documented through field studies include mortality due to environmental exposure, elevated predation, dehydration and lower reproductive activity.

(4) current research on the species;

Current research on the desert tortoise includes:

1) annual population estimates in Critical Habitat Units using line distance sampling;

2) disease occurrence and related mortality;

3) toxic elements in blood and liver tissue;

4) experimental translocation,

5) captive breeding and survival of young individuals into natural settings; and

6) existing management/recovery plans and the extent of their implementation.

The initial and subsequent recovery plans include recommendations for management of the species and its habitat that will contribute to the goal of recovery and eventual delisting, provided recovery goals are met.

With regard to the 1994 recovery plan, the USFWS stated in its 1994 rule (USFWS 1994b) for designation of Critical Habitat, that "*Desert tortoise populations have declined substantially throughout the Mojave Region in the last 2 decades, primarily due to habitat loss. These populations grow slowly, and significant improvement in the status of the Mojave population will be a very long process, measured in decades or centuries in most parts of the Mojave Region*."

Although the USFWS designated Critical Habitat for the Mojave population of the desert tortoise in 1994, it stated in the final rule (USFWS 1994b):

"*Designating critical habitat does not create a management plan, it does not establish numerical population goals, it does not prescribe specific management actions (inside or outside of critical habitat), nor does it have a direct effect on areas not designated as critical habitat. Specific management recommendations for critical habitat are more appropriately addressed in recovery plans, management plans, and section 7 consultations*."

Of the 4,754,000 acres of Critical Habitat in California, 2,968,300 acres are public lands managed by the BLM. Recovery of the species is largely dependent on provisions in that agency's CDCA Plan that protect Critical as well as non-Critical Habitat (e.g., linkage habitats between CHUs) through effective and timely implementation of specific management actions that reduce threats, and protect

and restore elements of the habitat that Agassiz's desert tortoise requires for survival, growth and reproduction.

Subsequent to the federal listing of the desert tortoise as threatened in 1990, the CDCA Plan was amended through several regional plan amendments that added goals and objectives and specific management actions intended to contribute to the recovery of the species. A few of these regional plan amendments included:

1) Northern and Eastern Mojave Plan (BLM 2002);
2) Northern and Eastern Colorado Desert Plan (BLM and CDFG 2002);
3) Western Colorado Desert Plan (BLM 2003):
4) West Mojave Plan (BLM et al. 2006); and
5) Desert Renewable Energy Conservation Plan (BLM 2016)

BLM's 2002, 2003 and 2006 regional plan amendments to the CDCA Plan established Areas of Critical Environmental Concern (ACECs) and associated land use restrictions to protect tortoise habitat; largely corresponding to Critical Habitat designated for the species in 1994. These amendments allowed off-highway vehicle use to continue on designated open routes, as well as livestock grazing with limitations on season of use and forage utilization.

These plan amendments did not envision renewable energy development demand on public lands, an issue that emerged in approximately 2007 when right-of-way applications for large-scale solar energy and wind energy projects were filed with the BLM on over 100,000 acres of public land. As a result, 10 large-scale solar energy projects were approved in occupied tortoise habitat, outside of Critical Habitat in the Ivanpah Valley, Chuckwalla Valley, Blythe Mesa and the central Mojave of California, totaling 31,578 acres.

Off-highway vehicle routes were also designated in these regional plan amendments within Agassiz's desert tortoise habitat as open, closed or, in rare instances, as limited to certain types of vehicles. BLM's route designation on 3 million acres of public land in the West Mojave Plan (WEMO) area was found to have violated the provisions of the National Environmental Policy Act, Executive Orders, and regulations governing the use of off-highway vehicles on public land, and the CDCA Plan.

Subsequently, BLM (2019) revised the WEMO Plan route designation to address these legal deficiencies. Defenders of Wildlife urged the CDFW to review and comment on this plan when it was being developed, but that did not happen. Unfortunately, the final plan established open routes and livestock grazing in Critical Habitat that were largely the same as in the 2006 WEMO Plan, with a few deleterious additions, including promoting unrestricted motorized vehicle use on

dry lake beds in Critical Habitat and introducing competitive event corridors through Critical Habitat.

In its request for formal consultation with the USFWS, the BLM determined the DRECP amendments of 2016 to the CDCA Plan would adversely affect both Agassiz's desert tortoise and its Critical Habitat. It is noteworthy that the DRECP established "development caps" within tortoise ACECs ranging from 0.1% - 0.5%; the latter of which applies to all Critical Habitat Units. However, these development caps do not include the effects of livestock grazing or indirect effects of off-highway vehicle use and development projects whose impacts extend beyond the direct footprint of the projects and vehicle routes. Standardized compensatory mitigation ratios were also established at 5:1 in Critical Habitat and 1:1 outside of Critical Habitat; and 2:1 within mapped tortoise habitat linkages that connect conservation areas (i.e., ACECs).

Although these various amendments to the CDCA Plan were intended to contribute to the recovery of Agassiz's desert tortoise (e.g., BLM 2016, BLM et al. 2005), the results of line distance sampling conducted by the USFWS DTRO show those intentions have not been met. They show tortoise populations in all Critical Habitat Units within California as continuing to decline rapidly, with most below the minimum viable density of 3.9 adults per square kilometer.

In its biological opinion for the DRECP adopted by the BLM in 2016, the USFWS (2016b) stated:

"*Despite the implementation of these actions, disturbance and human-caused mortality continue to occur in many areas of critical habitat (which overlap the desert wildlife management areas for the most part and are the management units for which most data are collected) to the extent that the conservation value and function of critical habitat is, to some degree, compromised*."

And that,

"*Unauthorized off-road vehicle use continues to disturb habitat and result in loss of vegetation within the boundaries of critical habitat (e.g., Coolgardie Mesa in the Western Mojave Recovery Unit); although we have not documented the death of desert tortoises as a direct result of this activity, it likely occurs. Additionally, the habitat disturbance caused by this unauthorized activity exacerbates the spread of invasive plants, which displace native plants that are important forage for the desert tortoise, thereby increasing the physiological stress faced by desert tortoises*."

The USFWS (2016b) also concluded that under the DRECP amendments:

"*…development of renewable energy facilities …would remove or degrade up to 11,290 acres of desert tortoise habitat within the action area*."

Of these, 4,734 acres are within Critical Habitat. However, the biological opinion does not address the effects of future renewable energy projects that may be proposed outside of Development Focus Areas (DFAs) for renewable energy; namely public lands now termed General Public Lands and Variance Process Lands.

The only documented exception to these ongoing declines is in the DTRNA in the Western Mojave Recovery Unit. The USFWS did not designate Critical Habitat for Agassiz's desert tortoise in this area because the existing reserve-level protection provisions largely eliminated threats to the species and its habitat, including:

1) closure to all off-highway vehicle use;
2) closure to all livestock grazing;
3) closure to mineral development; and
4) a protective perimeter fence to prevent trespass of vehicles and livestock.

Recent field research has confirmed that these protective actions have been effective in reversing ongoing declines in the Agassiz's desert tortoise population within the DTRNA compared to adjacent areas lacking these protective measures.

Berry et al. (2014) surveyed 260 km^2 in the Western Mojave Desert to evaluate relationships between condition of tortoise populations and habitat on lands that have experienced three different levels of management and protection. The DTRNA was most protected; Critical Habitat designated for the desert tortoise in the Western Rand Mountains Area of Critical Environmental Concern was considered moderately protected; and private lands were considered to have no protection.

The researchers found that live tortoise density was:

1) Six-times greater inside the DTRNA compared to adjacent Critical Habitat where intensive off-highway vehicle use occurs on a designated route network; and
2) Four-times greater than on adjacent private lands.

The crude annual death rates for adult tortoises was lowest in the DTRNA (2.8% per year), followed by private lands (6.3% per year) and Critical Habitat (20.4% per year). The high death rates in Critical Habitat were of particular

concern. When causes of death could be determined, they included vehicle crushing, gunshot, and predation by ravens and mammals.

(6) *Proposed land-use changes (include knowledge of forthcoming California Environmental Quality Act documents that may or should address impacts, and lead agencies involved);*

On 2/1/2018, the BLM issued a notice it intended to amend the DRECP in response to President Trump's executive orders requiring federal agencies to review regulations that unnecessarily impede energy development and deployment of broadband telecommunication facilities. We anticipate that BLM will propose amendments to the DRECP that reduce conservation lands designated in 2016, allow renewable energy development in ACECs and eliminate compensatory mitigation for land uses that adversely impact habitat for various focal species, including the desert tortoise. Proposed amendments to the DRECP are expected to be released for public review and comment in the spring of 2020. The BLM's notice is available here: https://www.blm.gov/california/BLM-to-consider-changes-desert-renewable-energy-conservation-plan.

(7) *County general plans, federal and State agency plans/actions or other plans/actions that address or should address the species*.

At this time, we are aware of only one local agency plan that places restrictions on development of renewable energy projects on private land, the Renewable Energy and Conservation Element of the San Bernardino County General Plan. That element of the General Plan restricts utility-scale solar energy development to private lands within DFAs designated by the BLM.

9. SUGGESTIONS FOR FUTURE MANAGEMENT

Describe activities that may be necessary to ensure future survival of the species after listing or delisting. Include recommendations for any or all of the following:

Although the desert tortoise is currently listed as threatened under the CESA and ESA, we provide recommendations for additional management actions that would promote its recovery under applicable items, below.

(1) *activities that would protect existing populations (site maintenance, preserve design establishment, etc.);*

While a majority of Agassiz's desert tortoise Critical Habitat in California has been designated as ACECs by the BLM for habitat protection and to promote recovery of the species, the types and intensity of land use activities allowed and

authorized on a regular basis within these areas continue to adversely impact the species. These ACECs should be managed as biological reserves in a manner similar to the DTRNA, where activities that adversely impact the species are largely prohibited (e.g., off-highway vehicle use, use of unlicensed motorized vehicles, and livestock grazing). This management level was stated in the 1994 Recovery Plan as a recovery action. However, this is not occurring.

Fencing highways and roads with tortoise exclusion fence would eliminate these linear features as population sinks and greater reduce the "road effect zone." This action would reduce tortoise mortality. Fencing highways is occurring in Nevada.

(2) *monitoring programs and studies;*

Science-based systematic monitoring of the impacts of off-highway vehicle use and livestock grazing is needed to assess the magnitude and extent of impact these activities have on Agassiz's desert tortoise, which would be used to develop additional protective measures or restrictions through the adaptive management process. Such systematic monitoring has not been initiated in California.

However, the BLM and others have developed an extensive bibliography of reliable information on the known adverse impacts of both recreational vehicle use and livestock grazing upon Agassiz's desert tortoise, some of which follows:

D.S. Ouren, et al. 2007. Report prepared for U.S. Geological Survey. Environmental Effects of Off-highway Vehicles on Bureau of Land Management Lands: A Literature Synthesis, Annotated Bibliographies, Extensive Bibliographies, and Internet Resources. Open File Report 2007-1353. https://pubs.usgs.gov/of/2007/1353/report.pdf.

R.H. Webb. H.G. Wilshire. 1983. Environmental Effects of Off-highway Vehicles. Impacts and Management in Arid Regions. https://www.springer.com/gp/book/9781461254560.

H.G. Wilshire, J.E. Nielson, and R.W. Hazlett. 2008. The American West at Risk. Science, Myths, and Politics of Land Abuse and Recovery. https://onlinelibrary.wiley.com/doi/full/10.1002/ldr.1070.

D.L. Donahue. 1999. The Western Range Revisited. Removing Livestock from Public Lands to Conserve Native Biodiversity. https://digitalrepository.unm.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1572&context=nrj.

(3) *needed amendments to existing management and land-use plans, including county general plans;*

The CDCA Plan is the primary document guiding management of public lands and was initially adopted in 1980 and amended many times over the past 39 years, such as by the DRECP in 2016 and by earlier regional plan amendments, identified above. The BLM finalized the West Mojave Plan Route Network and Livestock Grazing amendments to the CDCA Plan in 2019. (https://www.blm.gov/programs/planning-and-nepa/plans-development/california/west-mojave-plan-route-network).

Based on a thorough review of the CDCA Plan, we recommend that it be further amended to:

- eliminate livestock grazing in desert tortoise Critical Habitat and habitat linkages;
  restrict the use of unlicensed or non-street legal off-highway vehicles to BLM-designated Open Areas;
- close and restore all redundant vehicle routes in desert tortoise Critical Habitat and habitat linkages;
- establish a 15 mile per hour vehicle speed limit in all desert tortoise Critical Habitat;
- establish seasonal and/or temporary closure of motorized vehicle routes to off-highway vehicle use during the spring season and during precipitation events when standing water is on dirt roads and trails; and
- enforce existing restrictions and the restrictions suggested above in Critical Habitat areas.

(4) *agencies/organizations that should be involved in planning and implementing management and recovery actions;*

BLM (California Desert District and Field Offices); Department of Defense (Fort Irwin, MCAGCC, China Lake, Edwards Air Force Base, Chocolate Mountain Aerial Gunnery Range); California Department of Parks and Recreation; CDFW; Caltrans; respective planning departments in Kern County, San Bernardino County, Riverside County, Imperial County, and Inyo County.

(5*) other activities that would help protect existing habitat or ensure survival of the species;*

Plan for and implement effective and timely control of common raven populations within all Desert Tortoise Recovery Units with priority given to Critical Habitat Units within the Western Mojave Recovery Unit.

(6) *how other sensitive species (listed and unlisted) may benefit from protection of this species*; and

(7); *how other species/habitats may be impacted by management and recovery activities for this species*.

The state-listed Threatened Mohave ground squirrel would benefit because its declining range overlaps with the Agassiz's desert tortoise in large portions of the Western Mojave Recovery Unit. In addition, several federal and state-listed and sensitive plant species would benefit, such as the Barstow woolly sunflower, Desert cymopterus, Lane Mountain milk-vetch, Mojave monkeyflower, Mojave tarplant, Parish's daisy, and Triple-ribbed milk-vetch.

(8*) at what point this species would be considered stable and sustainable.*

The U.S. Fish and Wildlife established recovery criteria for the desert tortoise in its 1994 and Revised 2011 Recovery Plans. Recovery criteria include the management or elimination of threats, and addressing the five statutory delisting factors. However, at the time the Revised Recovery Plan was finalized, the USFWS considered the following three criteria applicable due to lack of information on the degree of threat posed by certain activities.

Recovery Objective 1 (Demography). Maintain self-sustaining populations of desert tortoises within each Recovery Unit into the future.

> *Recovery Criterion 1. Rates of population change (λ) for desert tortoises are increasing (i.e., λ > 1) over at least 25 years (a single tortoise generation).*

Recovery Objective 2 (Distribution). Maintain well-distributed populations of desert tortoises throughout each Recovery Unit.

> *Recovery Criterion 2. Distribution of desert tortoises throughout each tortoise conservation area is increasing over at least 25 years (i.e., ψ [occupancy] > 0).*

Recovery Objective 3 (Habitat). Ensure that habitat within each Recovery Unit is protected and managed to support long-term viability of desert tortoise populations.

> *Recovery Criterion 3. The quantity of desert tortoise habitat within each desert TCA is maintained with no net loss until tortoise population*

viability is ensured. When parameters relating habitat quality to tortoise populations are defined and a mechanism to track these parameters established, the condition of desert tortoise habitat should also be demonstrably improving.

The Revised Recovery Plan estimated that if all the recovery actions were implemented and were successful, desert tortoise recovery would be expected to occur by the year 2025. However, since none of the recovery criteria have been met, especially positive rates of change in populations over at least 25 years, recovery will take much longer, likely multiple decades or perhaps over 100 years.

10. AVAILABILITY AND SOURCES OF INFORMATION

Cite literature, available specimen collection records, and other pertinent reference materials. Attach documents critical to the recommended action. Be sure to include recent status surveys. List names, addresses, and telephone numbers of persons providing unpublished information and list those supporting the recommended action.

All cited literature used in this petition are identified above and full citations are included in Attachment 4 (Literature Cited), with many having website links to documents. Additional sources of information in support of this petition include:

U.S. Fish and Wildlife Service, Desert Tortoise Recovery Office. https://www.fws.gov/nevada/desert_tortoise/dtro/

Desert Tortoise Council Symposium (1976-2019) Text-searchable Proceedings https://deserttortoise.org/annual-symposium/symposium-proceedings/

Desert Tortoise Council Plans and Best Management Practices https://deserttortoise.org/library/plans-bmps/

Berry, K.H., Lyren, L.M., Mack, J.S., Brand, L.A., and Wood, D.A., 2016, Desert tortoise annotated bibliography, 1991–2015: U.S. Geological Survey Open-File Report 2016-1023, 312 p., http://dx.doi.org/10.3133/ofr20161023.

J.P. Hohman, R.D. Ohmart, and J. Schwartzmann. 1980. An Annotated Bibliography of the Desert Tortoise, Gopherus agassizii. Desert Tortoise Council Special Publication No. 1. https://deserttortoise.org/ocr_DTCdocs/1980.1AnnotatedBibliography-DesertTortoise-OCR.pdf.

11. DETAILED DISTRIBUTION MAP

Delineate on appropriate maps the historic and present distribution (estimated if not known). Include one map of California showing general distribution, and U.S. Geological Survey topographical maps (or equivalent) of appropriate scale, for more detailed distribution information, including locations of occurrences, populations or portions of populations, as appropriate. Include historic and current distribution as documented by literature, museum records, California Natural Diversity Data Base and other California Department of Fish and Wildlife records, and testimony of knowledgeable individuals. All maps must be suitable for black and white reproduction and fully labeled, including borders, base map name, map scale and species name, and should not exceed 11" x 14" in size.

Distribution maps of the desert tortoise are available on the following website links:

https://www.fws.gov/nevada/desert_tortoise/dt/images/tortoisemap-large.jpg

https://www.fws.gov/nevada/desert_tortoise/documents/publications/2013-Conserving-popln-linkages-mdt.pdf

https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=2660&inline=1

CONCLUSION

Thirty years after its listing as Threatened under provisions of the California and federal Endangered Species Acts, Agassiz's desert tortoise is in much worse condition than it was in 1990, and the number and severity of threats have increased. Threats to the species at the time of the 1990 federal listing as Threatened have not abated; they are becoming more widespread and intense.

Tortoises and their habitats are impacted by a myriad of authorized and illegal human activities that degrade or eliminate suitable creosote bush scrub and other vegetation communities needed as habitat, subsidize predators whose increased numbers prey on tortoises, and facilitate invasion of non-native species of plants that degrade habitat quality and displace native forbs and grasses needed for adequate nutrition and reproduction/recruitment.

Based on systematic USFWS-funded line distance sampling conducted by the Service's Desert Tortoise Recovery Office, from 2004 through 2014, adult tortoises in the three California Recovery Units declined by 51.3 percent over 10 years; and 9 of the 10 populations in these Recovery Units in California were below viability density. This decline is a continuation of an ongoing decline since the 1980s as documented by the data from permanent study plots on the CHUs and Recovery Units for the tortoise in California.

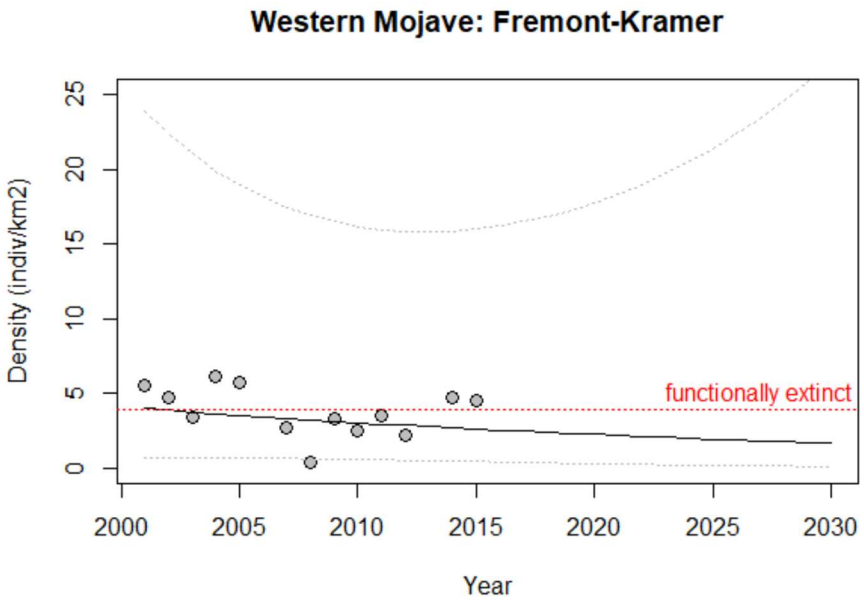
Based on the best available scientific information, as identified and summarized in this petition, naturally-occurring populations of Agassiz's desert tortoise are on the verge of extirpation in California from a variety of human-related threats. Defenders of Wildlife,

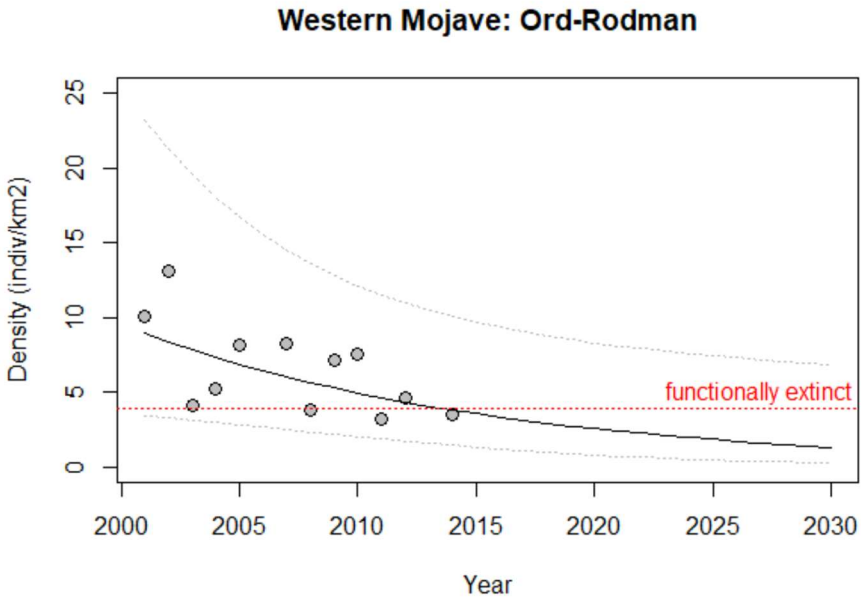
(3/94)

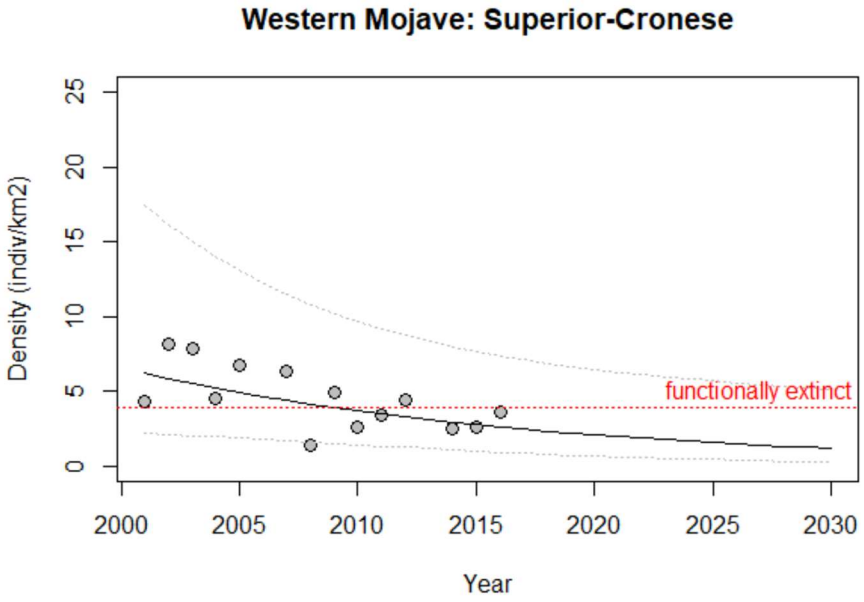
Desert Tortoise Council and Desert Tortoise Preserve Committee believe changing the status of Agassiz's desert tortoise from threatened to endangered under provisions of the California Endangered Species Act will more accurately reflect the status of the species under CESA; result in a higher-level of analysis of impacts from land use activities by CDFW; will result in more effective measures to avoid and minimize incidental take; and will result in higher levels of compensatory mitigation for unavoidable impacts. Combined, these outcomes will contribute to halting the decline of Agassiz's desert tortoise in California and provide conditions conducive to its recovery.

Attachment 1: Graphs of adult desert tortoise populations in Critical Habitat Units (CHU) in California, including minimum viable population density threshold (red dotted line = functionally extinct) and projected extirpation or extinction date. Population data are from USFWS line distance sampling reports.

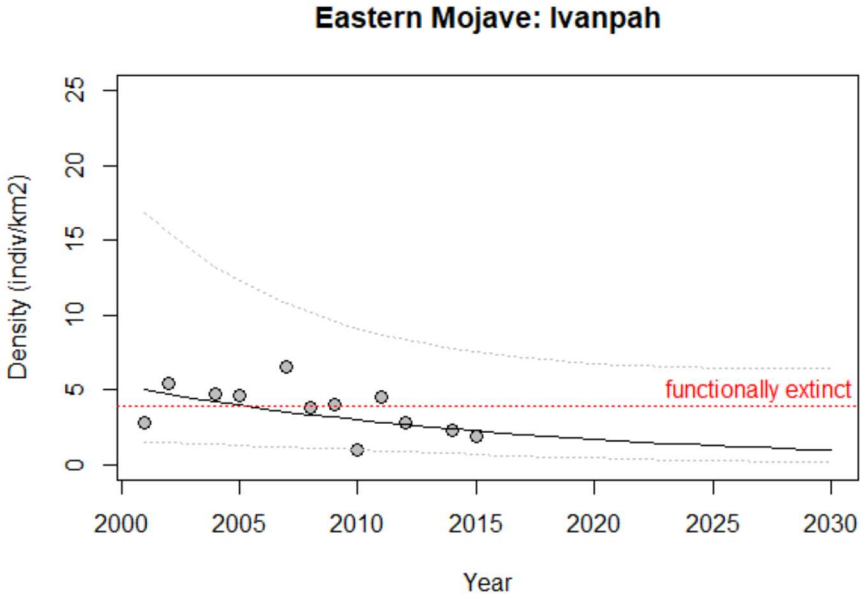
Western Mojave Recovery Unit



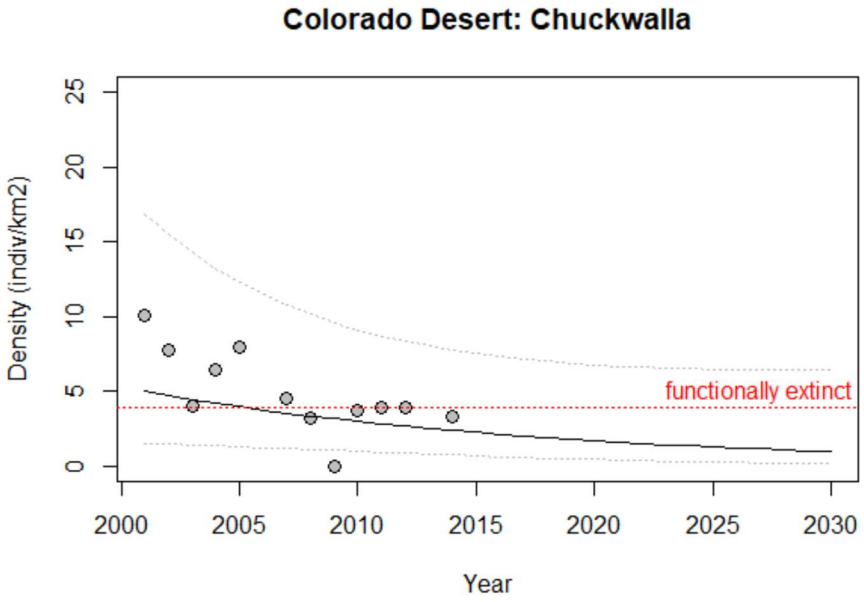


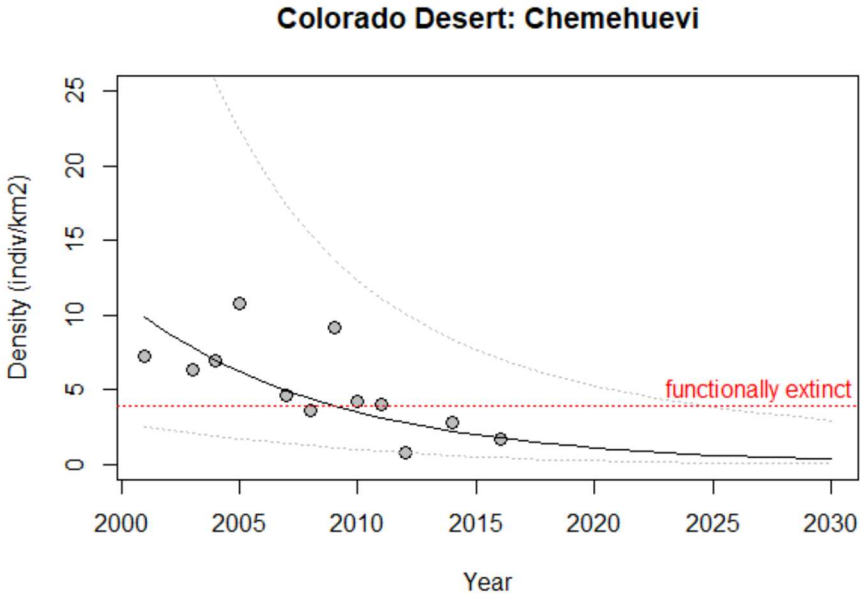


Eastern Mojave Recovery Unit

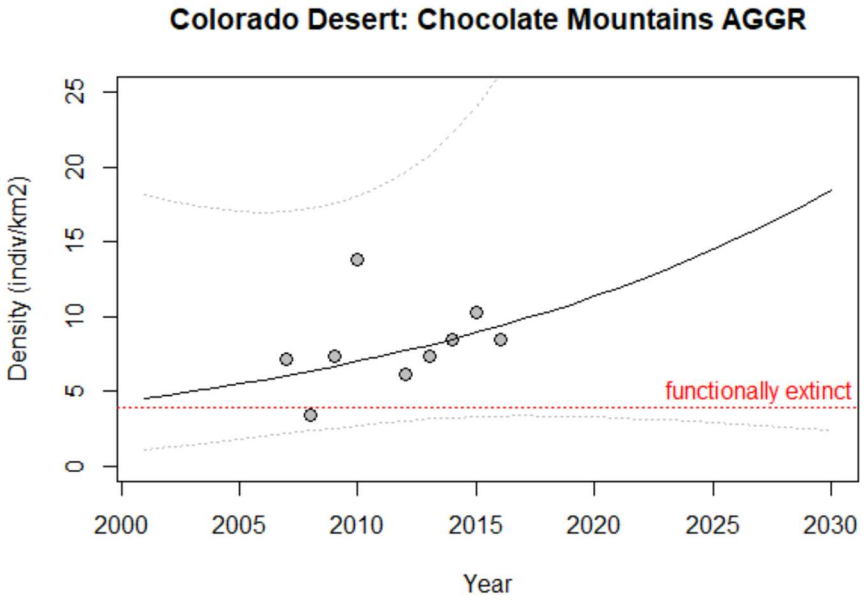


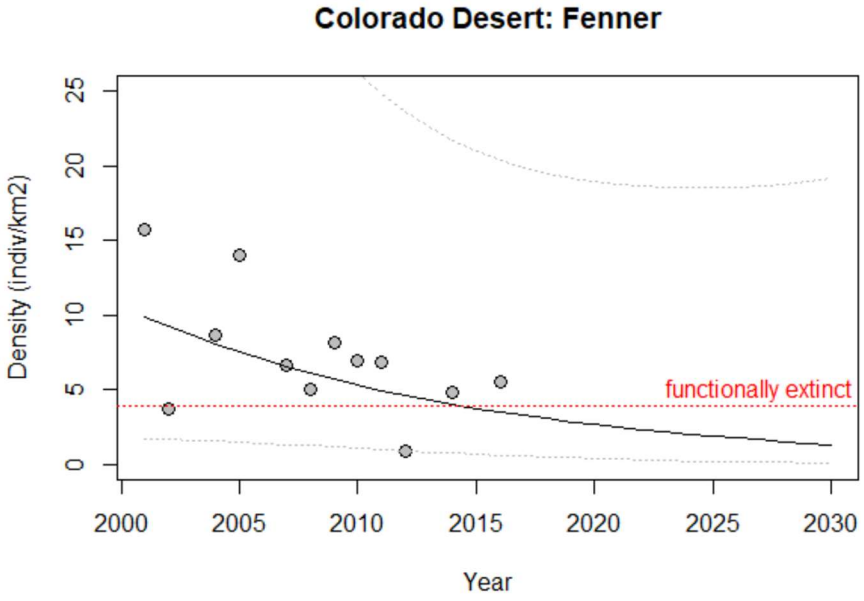
Colorado Desert Recovery Unit



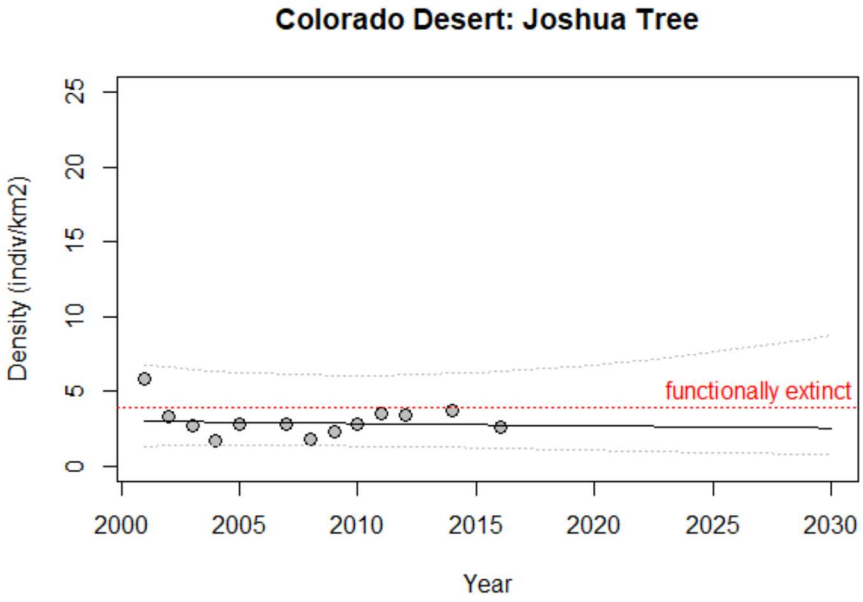


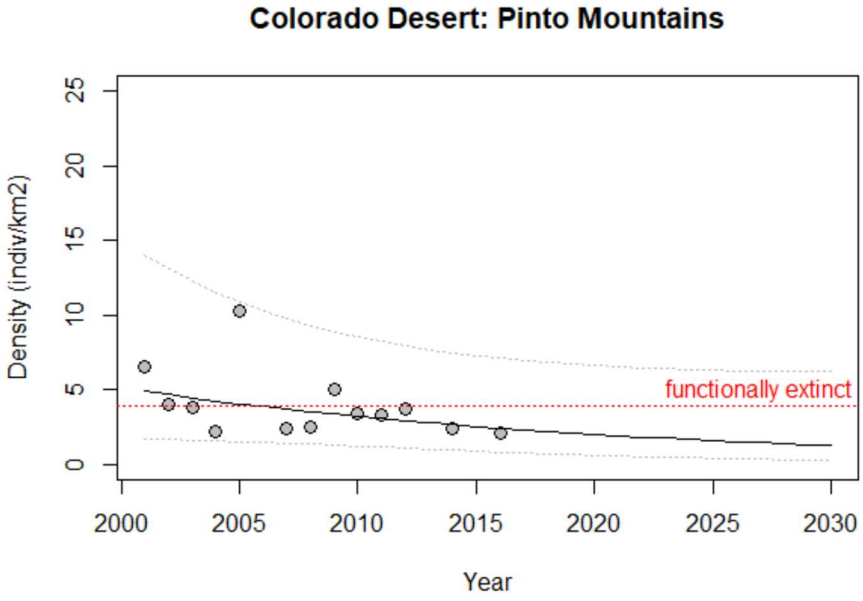
Colorado Desert Recovery Unit (continued)



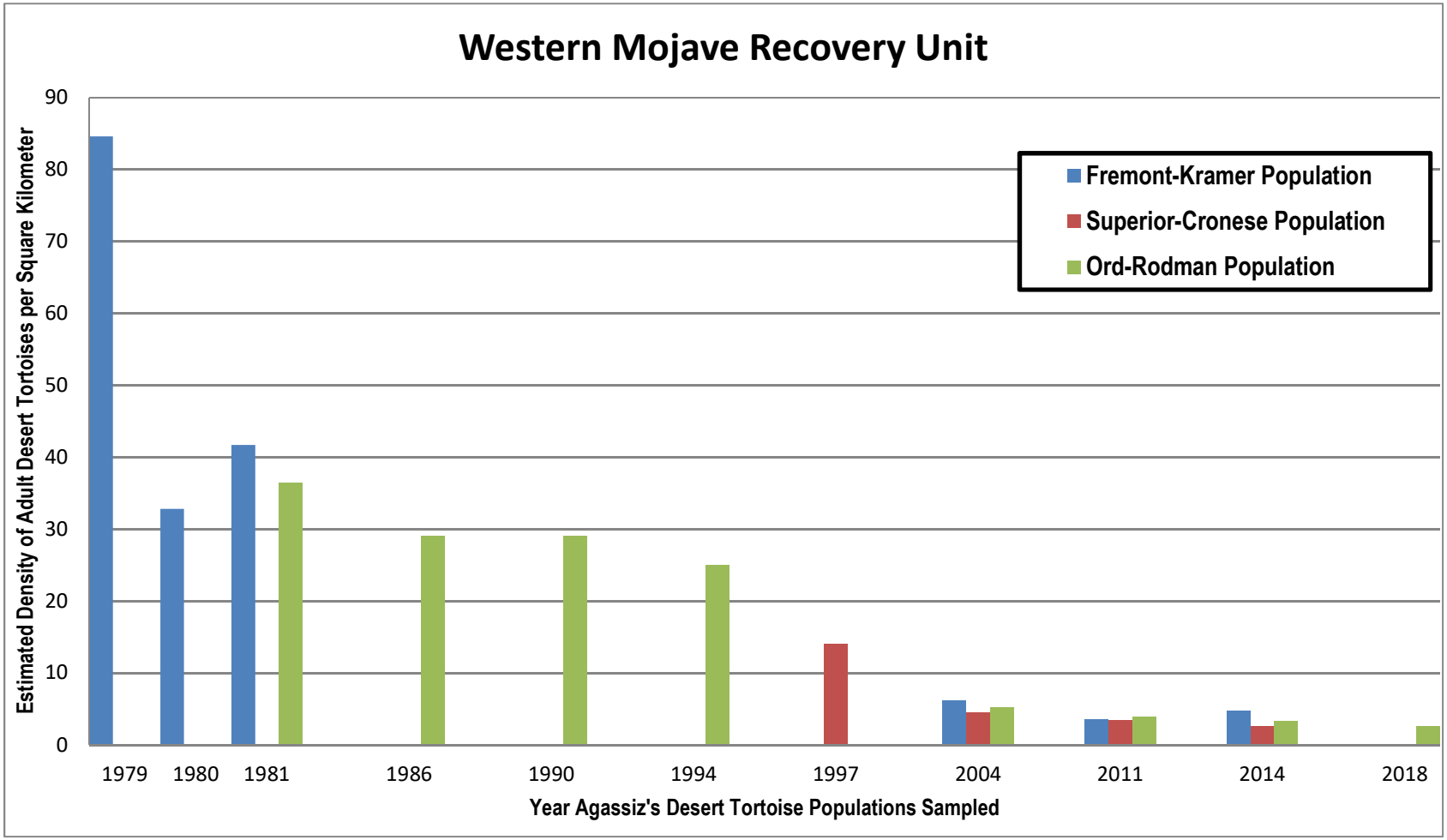


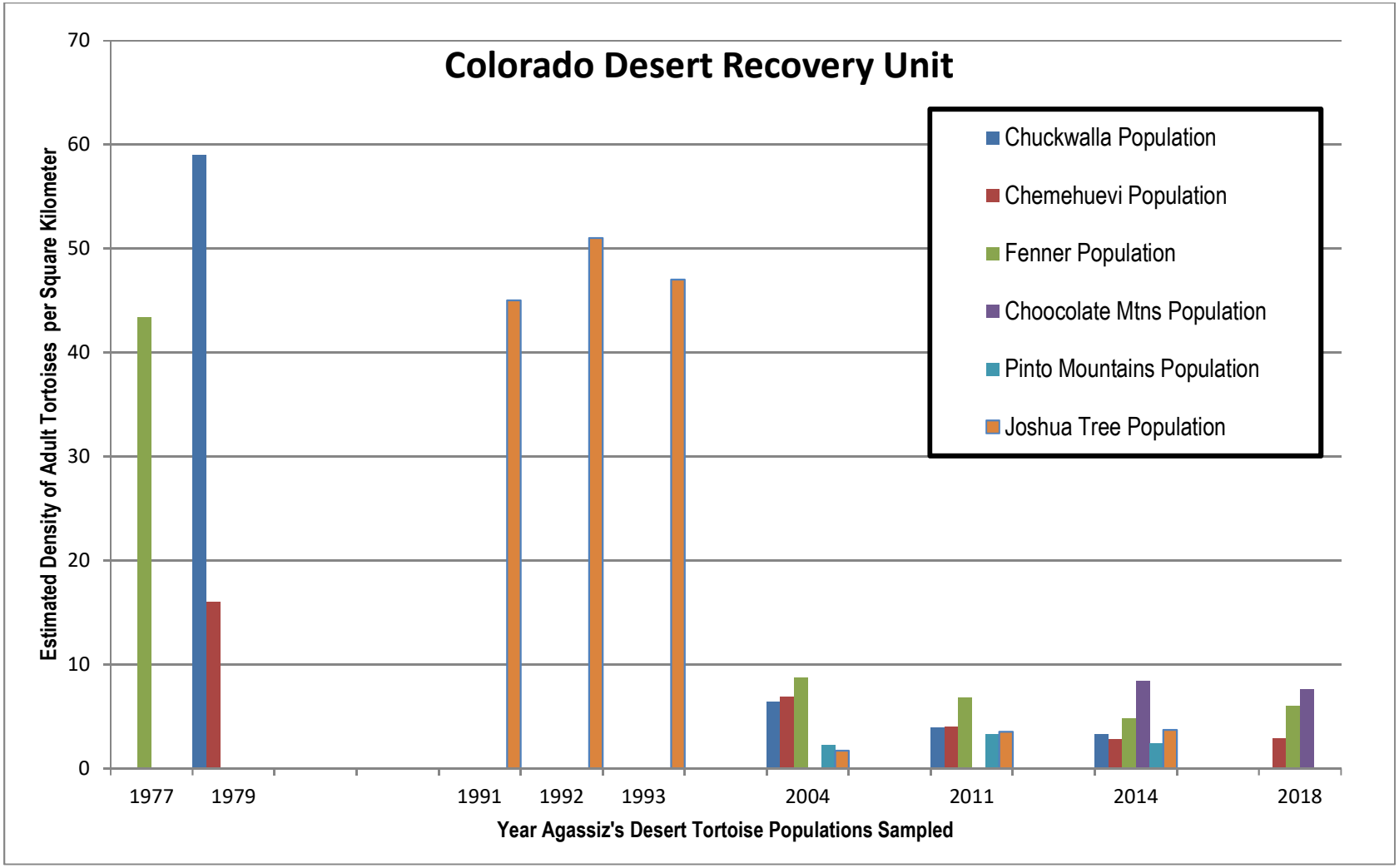
Colorado Desert Recovery Unit (continued)

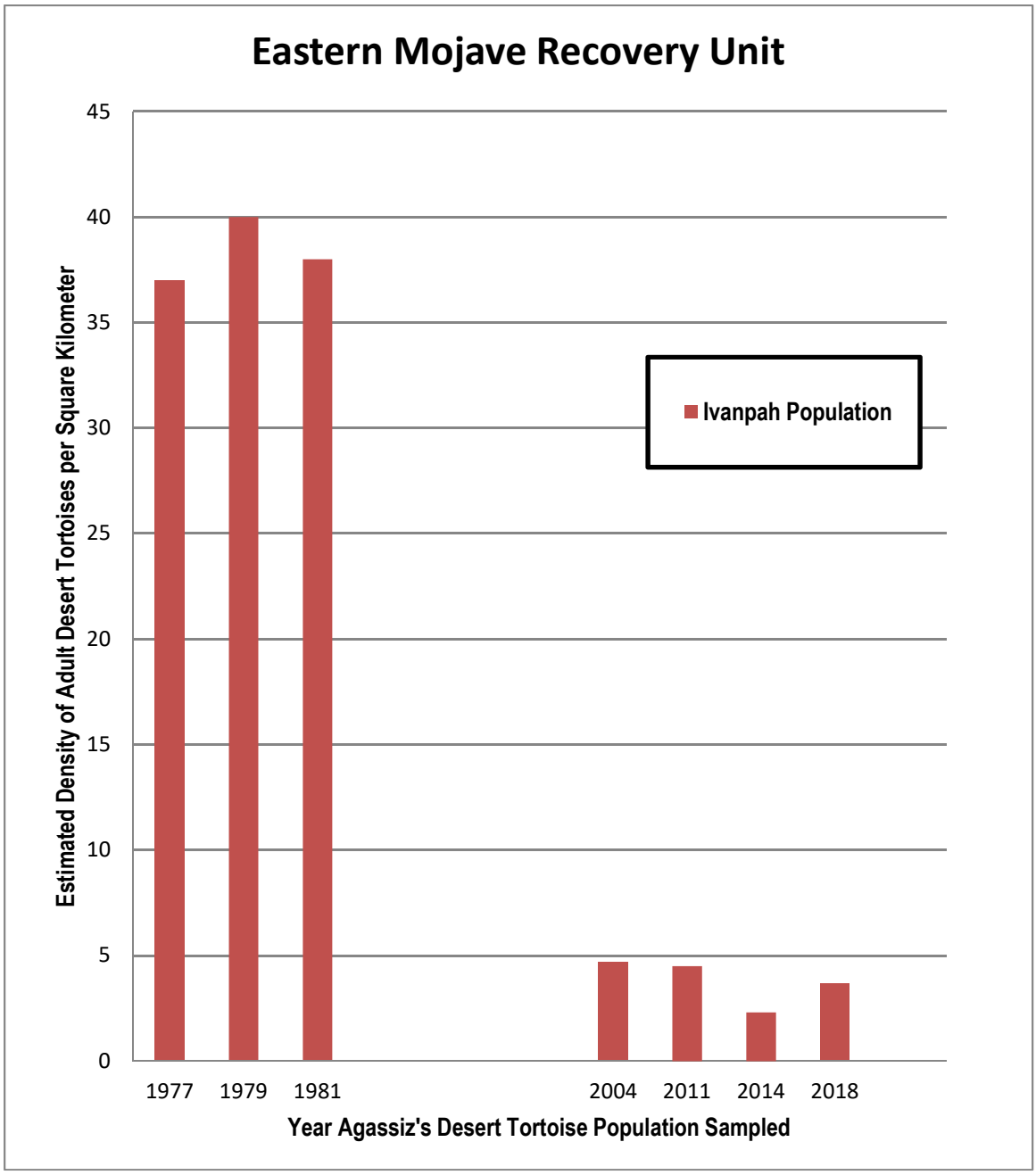




Attachment 2. Density estimates for adult Agassiz's desert tortoises for three Recovery Units (Western Mojave, Colorado Desert, and Eastern Mojave) in California. Data prior to 2001 is from permanent study plots and after 2001 is from line distance sampling.




Colorado Desert Recovery Unit
Estimated Density of Adult Tortoises per Square Kilometer
70
60
50
40
30
20
10
0
1977
1979
1991
1992
1993
2004
2011
2014
2018
Year Agassiz's Desert Tortoise Populations Sampled
Chuckwalla Population
Chemehuevi Population
Fenner Population
Choocolate Mtns Population
Pinto Mountains Population
Joshua Tree Population


Eastern Mojave Recovery Unit
Estimated Density of Adult Desert Tortoises per Square Kilometer
45
40
35
30
25
20
15
10
5
0
Ivanpah Population
1977
1979
1981
2004
2011
2014
2018
Year Agassiz's Desert Tortoise Population Sampled

Attachment 3: Roads, Trails and Disturbance Associated with Motorized Vehicle Use in Selected Desert Tortoise CHUs in the Western Mojave Recovery Unit [1]

The following provides an account of the miles of unpaved roads and trails; and acres of disturbance associated with vehicle camping, parking and stopping areas within desert tortoise CHUs in the Western Mojave Recovery Unit.

Critical Habitat Unit	Roads and Trails Open to Vehicle Use	Roads and Trails Closed to Vehicle Use[i]	Acres of Camping, Parking and Stopping Areas
Fremont-Kramer	897	1397	136
Ord-Rodman	317	488	42
Pinto Mountains	143	66	18
Superior-Cronese	832	765	111
Total	**2,189**	**2,716**	**307**

[i] Note: Although roads and trails are closed to vehicle use, a majority of these routes continue to be subject to unauthorized vehicle use due to the limited ability of law enforcement officers (BLM Rangers, CDFW Wardens, County Sheriffs Deputies) and the extremely high number of vehicle users.

[1] From: Bureau of Land Management. 2019. West Mojave Route Network Project Final Supplemental Environmental Impact Statement (BLM/CA/DOI-BLM-CA-D080-2018-0008-EIS).

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State of California
Department of Fish and Wildlife

Original on file,
received July 23, 2020

Memorandum

Date: July 23, 2020

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: Evaluation of a Petition to Change the Status of Mohave Desert Tortoise from Threatened to Endangered under the California Endangered Species Act

The California Department of Fish and Wildlife (Department) has completed its evaluation of a Petition to change the status of Mohave desert tortoise from threatened to endangered under the California Endangered Species Act, Fish and Game Code section 2050 et seq. The California Fish and Game Commission (Commission) received the Petition from Defenders of Wildlife, The Desert Tortoise Council, and The Desert Tortoise Preserve Committee on March 23, 2020. Pursuant to Fish and Game Code section 2073, the Commission referred the Petition to the Department on April 13, 2020.

The Department completed the attached Petition Evaluation report pursuant to Fish and Game Code section 2073.5. (See also Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1).). The Department's evaluation report delineates the categories of information required in a petition, evaluates the sufficiency of the available scientific information regarding each of the Petition components, and incorporates additional relevant information the Department possessed or received during the review period.

Based upon information contained in the petition and other relevant information in the Department's possession, the Department has determined there is sufficient scientific information available at this time to indicate the petitioned action may be warranted. The Department recommends the Petition be accepted and considered.

If you have any questions or need additional information, please contact Scott Gardner, Wildlife Branch Chief, at Scott.Gardner@wildlife.ca.gov.

Attachment

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REPORT TO THE FISH AND GAME COMMISSION

EVALUATION OF A PETITION FROM THE DESERT TORTOISE COUNCIL, THE DESERT TORTOISE PRESERVE COMMITTEE, AND DEFENDERS OF WILDLIFE TO CHANGE THE STATUS OF MOHAVE DESERT TORTOISE (*GOPHERUS AGASSIZII*) FROM THREATENED TO ENDANGERED UNDER THE CALIFORNIA ENDANGERED SPECIES ACT

Mohave Desert Tortoise (*Gopherus agassizii*) (Photo by BLM)

Prepared by
California Department of Fish and Wildlife

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EXECUTIVE SUMMARY

Defenders of Wildlife, the Desert Tortoise Council, and the Desert Tortoise Preserve Committee (Petitioners) submitted a petition (Petition) to the Fish and Game Commission (Commission) to change the status of Mohave desert tortoise (*Gopherus agassizii*) from threatened to endangered under the California Endangered Species Act (CESA).

The Commission referred the Petition to the Department of Fish and Wildlife (Department) in accordance with Fish and Game Code Section 2073 (Cal. Reg. Notice Register 2020, No. 18-Z, p. 693). Pursuant to Fish and Game Code section 2073.5 and California Code of Regulations, title 14, section 670.1, the Department prepared this evaluation report (Petition Evaluation) of the Petition. The purpose of the Petition Evaluation is to assess the scientific information discussed and cited in the Petition in relation to other relevant and available scientific information possessed or received by the Department during the evaluation period and to recommend to the Commission whether the scientific information in the Petition is sufficient under the criteria prescribed by CESA to accept and consider the Petition to list Mohave desert tortoise as endangered.

After reviewing the Petition and other relevant information, the Department determined the Petition meets the requirement in Fish and Game Code section 2072.3 that it include sufficient scientific information to indicate the petitioned action may be warranted. Specifically, the Department determined:

- *Population Trend*. The information in the Petition is sufficient to indicate the Mohave desert tortoise population in California has declined substantially from historical levels and has continued to trend downward since the species was listed as a threatened species by the Commission in 1989.

- *Range and Distribution*. Information in the Petition and otherwise available to the Department indicates the geographic range of the Mohave desert tortoise in California has not substantially changed since the early 1900s; however, some changes in its distribution within the range have occurred in recent years.

- *Abundance*. The Petition provides sufficient information to indicate substantial reductions in Mohave desert tortoise abundance have occurred in large areas of their range, and that the abundance has continued to decline since the species was listed as threatened in California in 1989.

- *Life History*. The Petition provides sufficient information on the life history of the Mohave desert tortoise.

- *Kind of Habitat Necessary for Survival*. The Petition presents sufficient information on Mohave desert tortoise habitat requirements.

- *Factors Affecting the Ability to Survive and Reproduce*. The Petition presents a list of the factors that affect the survival and reproduction of the Mohave desert tortoise, including land uses (ranching, mining, agriculture, urbanization, military operations, transportation networks, recreation, and utility corridors), weather impacts (storms, drought, availability of natural water), predation from artificially high predator populations, and factors associated with climate change.

- *Degree and Immediacy of Threat*. The Petition describes the degree and immediacy of threats to the continued existence of Mohave desert tortoise in California.

- *Impact of Existing Management Efforts*. The Petition describes land ownership and includes a cursory discussion of land management practices by ownership within designated Mohave desert tortoise Critical Habitat Units. However, it does not provide similar information for the species' entire range in California which encompasses an area far greater than the Critical Habitat Units. Nonetheless, the Petition provided sufficient information on the general patterns of land ownership and land management practices in the species' range.

- *Suggestions for Future Management*. The Petition includes potential monitoring suggestions, management actions, and additional protective measures that would benefit Mohave desert populations.

- *A Detailed Distribution Map*. The Petition provides internet links to three distribution maps for Mohave desert tortoise in California.

- *Availability and Sources of Information*. Numerous scientific references were cited in the Petition and listed in Petition Attachment 4 – Literature Cited.

In completing its Petition Evaluation, the Department has determined the Petition provides sufficient scientific information to indicate that the petitioned action to change the status of the Mohave Desert Tortoise from threatened to endangered may be warranted. Therefore, the Department recommends the Commission accept the Petition for further consideration under CESA.

INTRODUCTION

Candidacy Evaluation

The Commission has the authority to list certain “species” or “subspecies” as threatened or endangered under CESA. (Fish & G. Code, §§ 2062, 2067, and 2070.) The listing process is the same for species and subspecies. (Fish & G. Code, §§ 2070-2079.1.)

CESA sets forth a two-step process for listing a species as threatened or endangered. First, the Commission determines whether to designate a species as a candidate for listing by evaluating whether the petition provides “sufficient information to indicate that the petitioned action may be warranted.” (Fish & G. Code, § 2074.2, subd. (e)(2).) If the petition is accepted for consideration, the second step requires the Department to produce, within 12 months of the Commission’s acceptance of the petition, a peer reviewed report based upon the best scientific information available that indicates whether the petitioned action is warranted. (Fish & G. Code, § 2074.6.) Finally, the Commission, based on that report and other information in the administrative record, determines whether the petitioned action to list the species as threatened or endangered is warranted. (Fish & G. Code, § 2075.5.)

A petition to list a species under CESA must include “information regarding the population trend, range, distribution, abundance, and life history of a species, the factors affecting the ability of the population to survive and reproduce, the degree and immediacy of the threat, the impact of existing management efforts, suggestions for future management, and the availability and sources of information. The petition shall also include information regarding the kind of habitat necessary for species survival, a detailed distribution map, and any other factors that the petitioner deems relevant.” (Fish & G. Code, § 2072.3; see also Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1).) The range of a species for the Department’s petition evaluation and recommendation is the species’ California range. (*Cal. Forestry Assn. v. Cal. Fish and Game Com.* (2007) 156 Cal.App.4th 1535, 1551.)

Within 10 days of receipt of a petition, the Commission must refer the petition to the Department for evaluation. (Fish & G. Code, § 2073.) The Commission must also publish notice of receipt of the petition in the California Regulatory Notice Register. (Fish & G. Code, § 2073.3.) Within 90 days of receipt of the petition (or 120 days if the Commission grants an extension), the Department must evaluate the petition on its face and in relation to other relevant information and submit to the Commission a written evaluation report with one of the following recommendations:

- Based upon the information contained in the petition, there is not sufficient information to indicate that the petitioned action may be warranted, and the petition should be rejected; or
- Based upon the information contained in the petition, there is sufficient information to indicate that the petitioned action may be warranted, and the petition should be accepted and considered.

(Fish & G. Code, § 2073.5, subds. (a)-(b).) The Department's candidacy recommendation to the Commission is based on an evaluation of whether the petition provides sufficient scientific information relevant to the petition components set forth in Fish and Game Code Section 2072.3 and the California Code of Regulations, Title 14, Section 670.1, subdivision (d)(1).

In *Center for Biological Diversity v. California Fish and Game Commission* (2008) 166 Cal.App.4th 597, the California Court of Appeals addressed the parameters of the Commission's determination of whether a petitioned action should be accepted for consideration pursuant to Fish and Game Code Section 2074.2, subdivision (e), resulting in the species being listed as a candidate species. The court began its discussion by describing the standard for accepting a petition for consideration previously set forth in *Natural Resources Defense Council v. California Fish and Game Commission* (1994) 28 Cal.App.4th 1104:

> As we explained in *Natural Resources Defense Council*, "the term 'sufficient information' in section 2074.2 means that amount of information, when considered with the Department's written report and the comments received, that would lead a reasonable person to conclude the petitioned action may be warranted." The phrase "may be warranted" "is appropriately characterized as a 'substantial possibility that listing could occur.'" "Substantial possibility," in turn, means something more than the one-sided "reasonable possibility" test for an environmental impact report but does not require that listing be more likely than not.

(*Center for Biological Diversity*, *supra*, 166 Cal.App.4th at pp. 609-10 [internal citations omitted].) The court acknowledged that "the Commission is the finder of fact in the first instance in evaluating the information in the record." (*Id.* at p. 611.) However, the court clarified:

> [T]he standard, at this threshold in the listing process, requires only that a substantial possibility of listing could be found by an objective, reasonable person. The Commission is not free to choose between conflicting inferences on subordinate issues and thereafter rely upon those choices in assessing how a reasonable person would view the listing decision. Its decision turns not on rationally based doubt about listing, but on the absence of any substantial possibility that the species could be listed after the requisite review of the status of the species by the Department under [Fish and Game Code] section 2074.6. (*Ibid*.)

CESA defines the "species" eligible for listing to include "species or subspecies" (Fish and G. Code, §§ 2062, 2067, and 2068), and courts have held that the term "species or subspecies" includes "evolutionarily significant units." (*Central Coast Forest Assn. v. Fish & Game Com.* (2018) 18 Cal.App.5th 1191, 1236, *citing Cal. Forestry Assn.*, *supra*, 156 Cal.App.4th at pp. 1542 and 1549.)

Desert Tortoise Taxonomy

Desert tortoises are members of the order Testudines, family Testudinidae, genus *Gopherus*. When the Commission listed desert tortoise in 1989, *Gopherus agassizii* was understood to range from southeastern California, across southern Nevada, through western Arizona, and south into Sonora and Sinaloa, Mexico (Figure 1). Since that time, studies of tortoise genetics, morphometrics, and ecology have led experts to conclude that the complex formerly known as "desert tortoise" in fact consists of two separate species, Mohave desert tortoise and Sonoran desert tortoise (Murphy et al. 2011, Iverson et al. 2017). Mohave desert tortoise, also known as Agassiz's desert tortoise, retains the binomial *G. agassizii*, and ranges across the deserts of southeastern California, southern Nevada, and small areas of Arizona and Utah north of the Colorado River. Desert tortoises south of the Colorado River in Arizona and northern Mexico are now classified as Sonoran desert tortoise, also known as Morafka's desert tortoise, (*Gopherus morafkai*). Only the Mohave (Agassiz's) desert tortoise occurs in California. References to Agassiz's desert tortoise and Mohave desert tortoise in the Petition and this evaluation should be considered synonymous. This evaluation uses the common name Mohave desert tortoise when referring to *G. agassizii* as the species is currently understood.

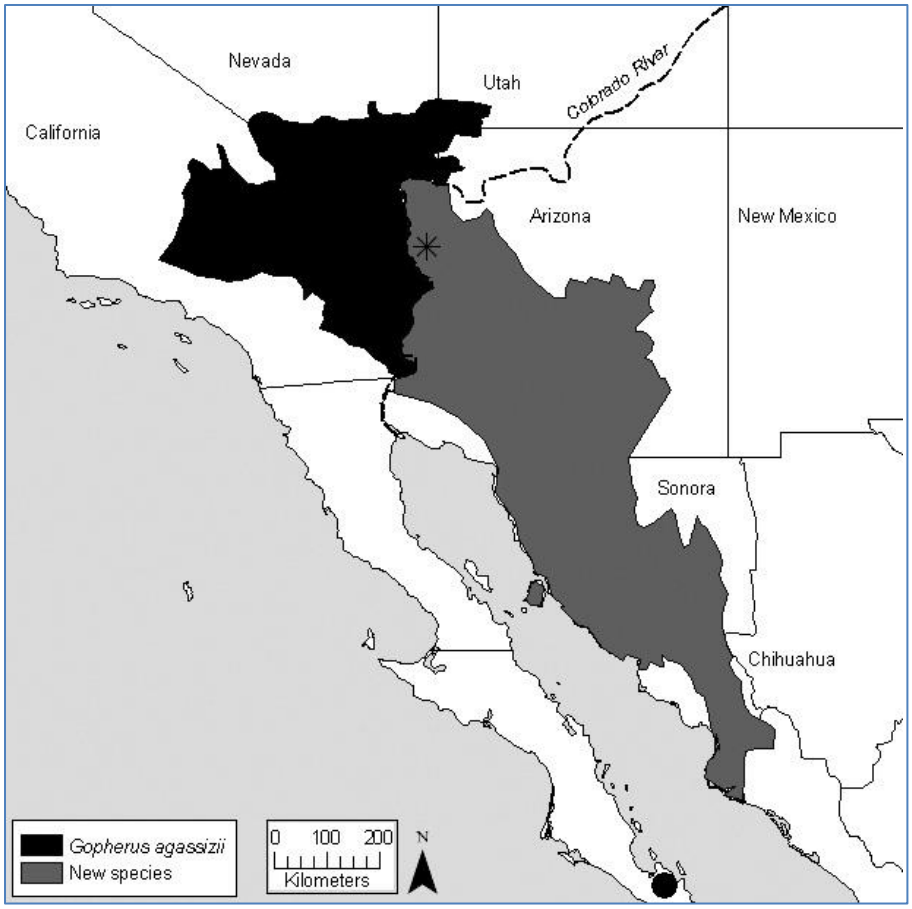

Figure 1. Distribution of Agassiz's or Mohave desert tortoise (*Gopherus agassizii,* black polygon) and Morafka's or Sonoran desert tortoise (*Gopherus morafkai,* gray polygon). Prior to taxonomic revision the two species collectively were considered "desert tortoise" (*G. agassizii*). Figure from Murphy et al. (2011).

Petition History

The desert tortoise was listed as a threatened species by the U.S. Fish and Wildlife Service (USFWS) in 1980 throughout its range which includes southeastern California. In 1989, the Commission listed desert tortoise as a threatened species under CESA. On March 23, 2020, the Commission received a Petition from The Desert Tortoise Council, The Desert Tortoise Preserve Committee, and Defenders of Wildlife to change the status of Mohave desert tortoise from threatened to endangered. On April 13, 2020, the Commission referred the Petition to the Department for evaluation. At its meeting on April 16, 2020, the Commission officially received the Petition.

The Department evaluated the scientific information presented in the Petition as well as other relevant information the Department possessed at the time of review. Pursuant to Fish and Game Code Section 2072.3 and Section 670.1, subdivision (d)(1), of Title 14 of the California Code of Regulations, the Department evaluated whether the Petition included sufficient scientific information regarding each of the following petition components to indicate that the petitioned action may be warranted:

- Population trend;
- Range;
- Distribution;
- Abundance;
- Life history;
- Kind of habitat necessary for survival;
- Factors affecting the ability to survive and reproduce;
- Degree and immediacy of threat;
- Impact of existing management efforts;
- Suggestions for future management;
- Availability and sources of information; and
- A detailed distribution map.

Overview of Mohave Desert Tortoise Ecology

Information in this section is summarized from Berry and Murphy's (2019) recent monograph on the species. The carapaces (shells) of hatchling Mohave desert tortoises average about 44 mm (1.7 in.) long while adult carapaces range in length from 178 to >370 mm (7.0 – 14.5 in.). Females are typically slightly smaller, averaging approximately 220 mm (8.7 in.), while males average about 243 mm (9.6 in.).

In California, the species occupies much of the Mojave Desert and portions of the Sonoran and Great Basin Deserts. It ranges from the southern end of the Owens Valley in the north to the Mexican border near the southeastern corner of the state, and from the Colorado River in the east to the lower slopes of the Sierra Nevada, Tehachapi, San Gabriel, San Bernardino, and Peninsular Mountains in the west (Figure 2).

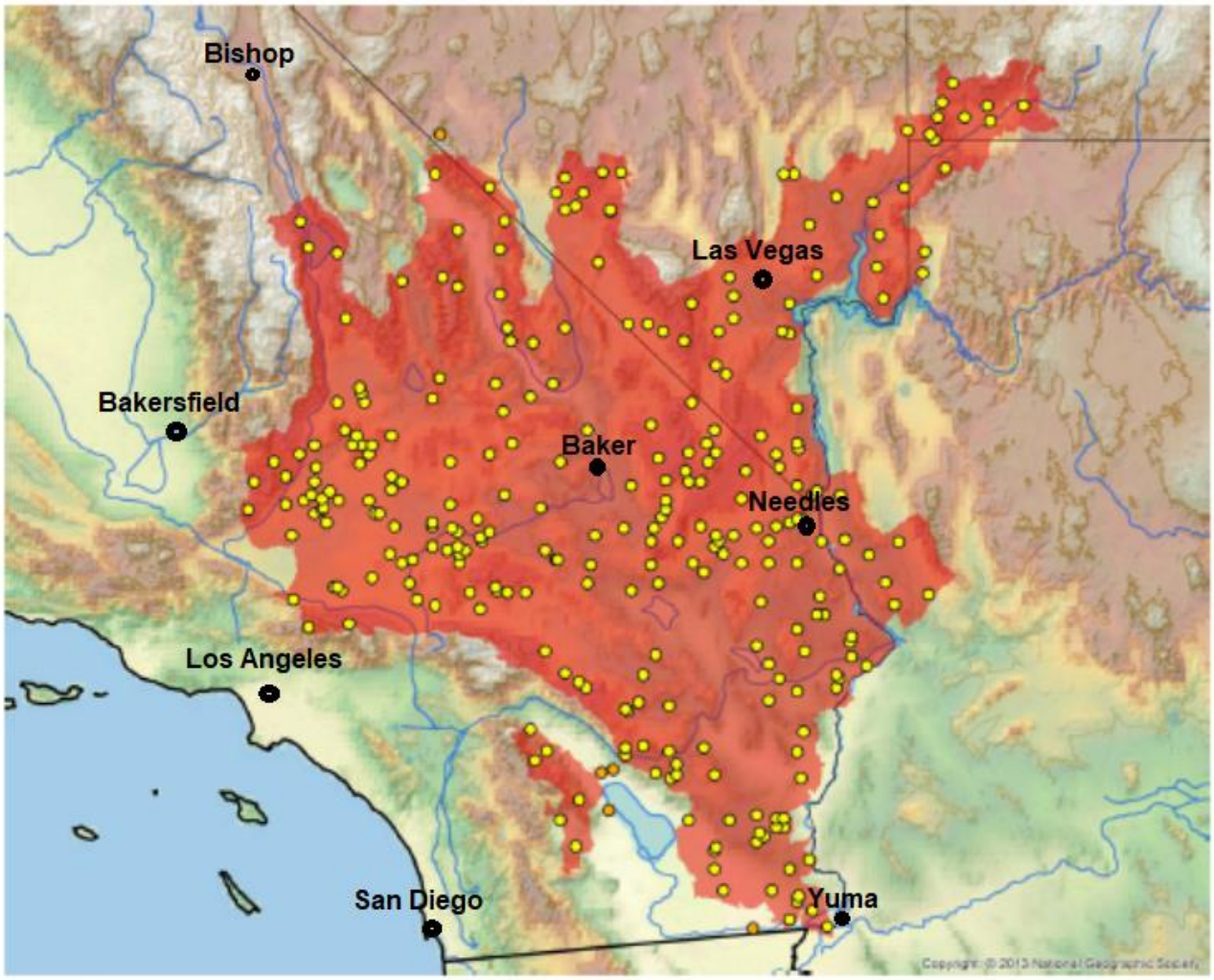

Figure 2. Range and distribution (yellow dots) of Mohave desert tortoise. Figure from Berry and Murphy (2019).

Mohave desert tortoises require topography, geologic features such as rock crevices and the banks of washes, and suitable soils for cover and the construction of burrows and dens. Shrub or tree cover is essential for protection from extreme temperature, precipitation, and predators. Over 70% of burrows occur beneath shrubs, with the larger shrubs or trees preferred. In the lowlands and dry lakebeds of the Mojave Desert ecosystem, tortoises are associated with several vegetation types in the Chenopodiaceae subfamily, including saltbush (*Atriplex* spp.). Most vegetation associations used by desert tortoise contain creosote bush (*Larrea tridentata*), often with white bur-sage (*Ambrosia dumosa*) or cheesebush (*A. salsola*) and several other species of shrubs, cacti, and perennial grasses. At higher elevations tree yuccas (Joshua tree, *Yucca brevifolia,* and Mojave yucca, *Y. schidigera*) and woody shrubs become more common, including blackbrush (*Coleogyne ramosissima*) associations at the highest elevations. The hotter western Sonoran Desert is characterized by creosote bushes, but also includes woodlands of blue palo verde (*Parkinsonia florida*), smoke tree (*Psorothamnus spinosus*), and ironwood (*Olneya tesota*) associated with dry stream channels interspersed with sparse ocotillo (*Fouqueria splendens*), creosote bush, and other shrubs, and cacti. Mohave desert tortoise densities are highest where diverse assemblages of grass, cacti, shrub, and tree cover occur, and low where shrub cover is sparse and precipitation is scarce and erratic. Densities also decline in areas modified by human activities.

Mohave desert tortoises eat annual plants, herbaceous perennials, succulents (cacti), and flowers and leaves of a few perennial shrubs.

Mohave desert tortoises spend >90% of their lives inactive and underground in burrows, pallets (shallow burrows which provide at least partial cover from the sun and predators), caves, or other cover which they can excavate themselves within a few days of hatching. While underground tortoises can reduce their metabolic rates to conserve water and energy. Burrows are often ≥ 3 m (9 ft.) long and ≥ 1 m (3 ft.) below the surface. Denning burrows, which may be used by multiple tortoises, are often found in washes, and may contain side rooms. Underground refuges provide shelter during periods of extreme heat and during droughts and food shortages. Mohave desert tortoise burrows and dens are important landscape features utilized by a wide range of invertebrates, reptiles, birds, and mammals (Henen et al.1998).

Activity patterns, both daily and seasonal, are strongly influenced by temperatures, the timing and amounts of precipitation, availability of free water to drink, and the availability of forage. Tortoises generally emerge from hibernation or brumation (a torpor like state of slowed metabolic activity) in late winter or early spring, followed by above-ground foraging and interactions with other tortoises. By late spring most individuals retreat to burrows, dens, pallets, and rock structures. Tortoises occasionally emerge from cover in early morning or late evening in June and July. From August through late October or early November above ground activity increases until temperatures fall, when individuals retreat underground to hibernate.

Courtship takes place in both the spring and fall, and polyandry (multiple males breeding with the same female) is not uncommon. Females first breed at 12 to 20 years of age and can store sperm and use it to fertilize eggs for several years after mating. Females lay up to three clutches of 1 to 10 eggs in nests within dens, burrows, pallets, and mounds as well as under shrubs. More eggs are laid when forage conditions are favorable. The sex of offspring is determined by the temperature eggs reach during incubation. Warmer conditions result in more females, and colder in more males. Consequently, local populations often have highly skewed sex ratios.

Home ranges of males are generally larger than females. In the central Mojave Desert, Harless et al. (2009) found males had home ranges of 43 to 49 ha (106 to 121 ac.), and females 16 to 17 ha (39.5 to 42 ac.) using minimum convex polygons. Home ranges of juveniles were smaller than those of adults.

Throughout their life stages, Mohave desert tortoises are subject to predation by a wide range of predators. Eggs are consumed by several vertebrate predators, such as Gila monsters (*Heloderma suspectum*), desert kit fox (*Vulpes macrotis*), coyote (*Canis latrans*), American badger (*Taxidea taxus*), and spotted skunks (*Spilogale gracilis*). Hatchlings can be killed by ants, including fire ants (*Solenopsis* spp.), common ravens (*Corvus corax*), bobcats (*Lynx rufus*), desert kit fox, rodents, and burrowing owls (*Athene cunicularia*). Adults are known to be preyed upon by common ravens, golden eagles (*Aquila chrysaetos*), coyotes, bobcats, mountain lions (*Puma concolor*), American badgers, and domestic dogs (*Canis lupus familiaris*).

SUFFICIENCY OF SCIENTIFIC INFORMATION TO INDICATE THE PETITIONED ACTION FOR MOHAVE DESERT TORTOISE MAY BE WARRANTED

The Petition components are evaluated below, pursuant to Fish and Game Code Section 2072.3 and Section 670.1, subdivision (d)(1), of Title 14 of the California Code of Regulations.

Population Trend

Scientific Information in the Petition

The Petition discusses population trends on pages 7to 21 under the heading "Population Trends".

The Petition relies upon analyses of long-term Mohave desert tortoise monitoring projects to characterize the population trend of the species. The Petition presents (see Petition Tables 1a. and 1b.) results from a long-term, fixed plot intensive search monitoring project conducted by the U.S. Bureau of Land Management (BLM) in the late 1970s and later surveyed by the U.S. Geologic Survey (Figure 3). These data illustrate a general pattern of decline in adult Mohave desert tortoise population density estimates in the Desert Tortoise Recovery Units (RUs), Critical Habitat Units (CHUs), Conservation Areas (CAs) and Wildlife Management Areas (WMAs) sampled 1977 to 2000; with a few exceptions such as the Joshua Tree Unit where populations appear to have increased or remained stable. Berry (2003) analyzed the results of these periodic intensive search surveys and found declines of 50% to 96% in adult tortoise densities between the late 1970s and early 2000s. In the Desert Tortoise Research Natural Area within the Western Mojave Recovery Unit, from 1982 to 1992 the overall Mohave desert tortoise population declined by 86%, with the adult population declining by about 94%, primarily due to Mycoplasmosis disease mortality (Brown et al. 1999).

Population estimates of permanent study plots in the Colorado Desert Recovery Unit at Chemehuevi Valley and Chuckwalla Bench showed population declines as high as 90% from the early 1990s to the 2000s (BLM and CDFG 2002). Surveys performed in 2000 showed all tortoise size classes in sampled eastern Mojave Desert Critical Habitat Units declined from previous tortoise population estimates, some by 76% to 80%. Larger tortoise size classes were estimated to have declined by as much as 90% from previous estimates (Berry 2000, BLM 2002).

Beginning in 2001, at the direction of the interagency Desert Tortoise Management Oversight Group, the long-term monitoring strategy was changed to line-distance sampling on randomly established plots to determine density estimates. Petition Table 3 presents the Mohave desert tortoise density estimates derived from annual line-distance sampling surveys by year from 2001 to 2019. Density estimates trend lower across all units except for the Ivanpah CHU, where the trend is less apparent. The USFWS (2015) analyzed density estimate data from 2004 to 2014 and found declines of 30 to 65% over the decade across the units except for the Joshua Tree sampling unit where the density estimate increased by 178%. Despite the dramatic increase in the Joshua Tree sampling unit, the overall density estimate for the larger Colorado Desert Recovery Unit, which contains Joshua Tree and five other sampling units, declined by more than 36% (USFWS 2015).

The 1994 Recovery Plan for the Mojave Population of the Desert Tortoise (USFWS 1994) determined that the minimum viable tortoise population density is 3.9 adults per square kilometer, or approximately 10 per square mile. The density estimates in nine of the 10 California Mohave desert tortoise sampling units were below the minimum viable density in 2014 (USFWS 2015).

Taken together, the two long-term monitoring projects indicate the Mohave desert tortoise population declined substantially in most sampling units from 1977 to 2000, and then substantially declined further from 2001 to 2014. The most recent estimates indicate the population densities in most sampling units are below the minimum density determined necessary to sustain populations.

Other Relevant Scientific Information

The USFWS Range-Wide Monitoring of the Mohave Desert Tortoise 2019 Annual Report (USFWS 2020) indicates that density estimates in eight of the nine reported sampling units remain below the minimum viable density of 3.9 adults per square kilometer.

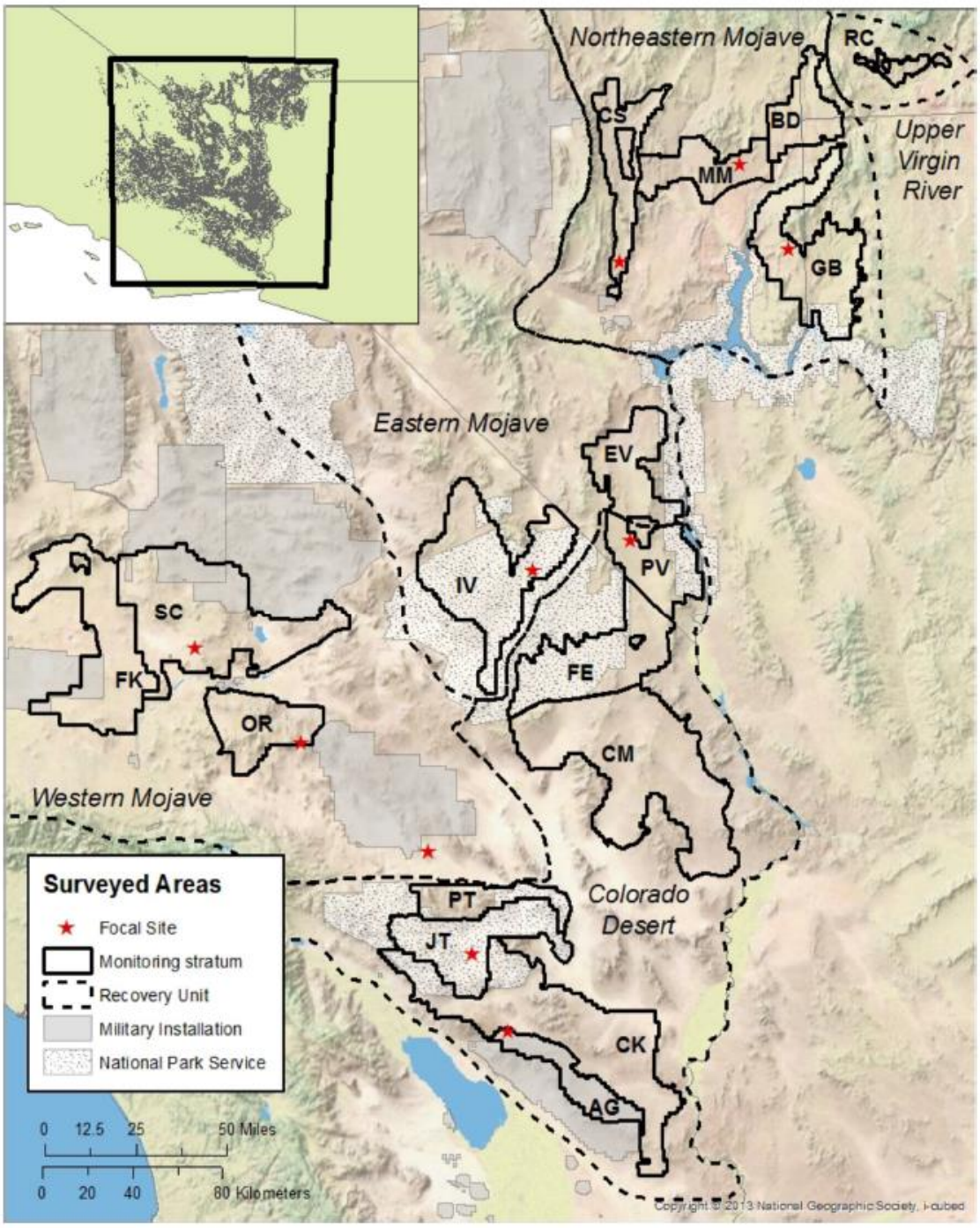

Figure 3. Mohave desert tortoise Recovery Units (dashed lines) and Critical Habitat Units (solid lines, shown as “Monitoring stratum” in legend). FK = Fremont-Kramer, SC = Superior-Cronese, OR = Ord-Rodman, PT = Pinto Mountains, JT = Joshua Tree, CK = Chuckwalla, AG = Chocolate Mtns, Aerial Gunnery Range, CM = Chemehuevi, FE = Fenner, IV = Ivanpah. This figure appears as Figure 1 in the Petition. Figure source is USFWS (2020).

Conclusion

While the Petition did not include a Mohave desert tortoise population estimate it presented observed population density data that indicate populations have dramatically declined over the last 40 years. Population census data is lacking for most wildlife species and the use of density estimates as a surrogate for tracking trends in population size is a commonly accepted practice (e.g. Anderson et al. 1979). The information in the Petition is sufficient to indicate the Mohave desert tortoise population in California has declined substantially from historical levels and has continued to trend downward since the species was listed as a threatened species by the Commission in 1989.

Geographic Range and Distribution

Scientific Information in the Petition

The Petition discusses geographic range and distribution on pages 21 to 25.

The Petition provided information on changes in Mohave desert tortoise distribution associated with the expansion of two military installations: Fort Irwin in 2002, and the U.S. Marine Corps Air Ground Combat Center in 2013. This information indicates changes in the distribution of Mohave desert tortoises may have occurred, but it does not inform trends in the historical or current geographic range.

Other Relevant Scientific Information

The Mohave desert tortoise is distributed through the Mojave Desert and portions of the Sonoran and Great Basin Deserts from the southern end of the Owens Valley in the north to the Mexican border near the southeastern corner of the state, and from the Colorado River in the east to the lower slopes of the Sierra Nevada, transverse, and Peninsular Mountains in the west (Berry and Murphy 2019). Grinnell and Camp (1917) produced an early desert tortoise distribution map based on museum records available at the time (Figure 4), and Patterson (1981), produced the first map of desert tortoise distribution derived from available literature and museum records as well as the observation of herpetologist (Figure 5). These early distribution maps show the same general pattern of distribution and range as contemporary maps such as Berry and Murphy (2019, see Figure 2). Accordingly, The USFWS (2019) concluded the species' distribution has not changed substantially in terms of the overall extent of its range, although desert tortoises have been removed from portions of their range for solar developments, military activities, and other development projects.

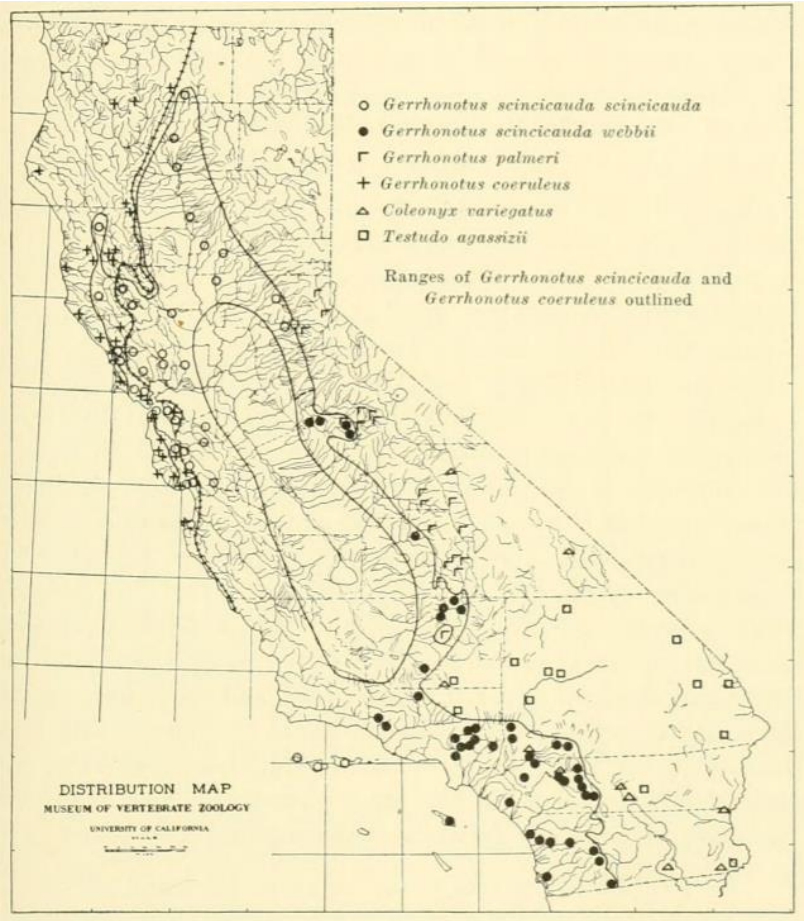

Figure 4. Distribution of desert tortoise records (open squares) from Grinnell and Camp (1917).

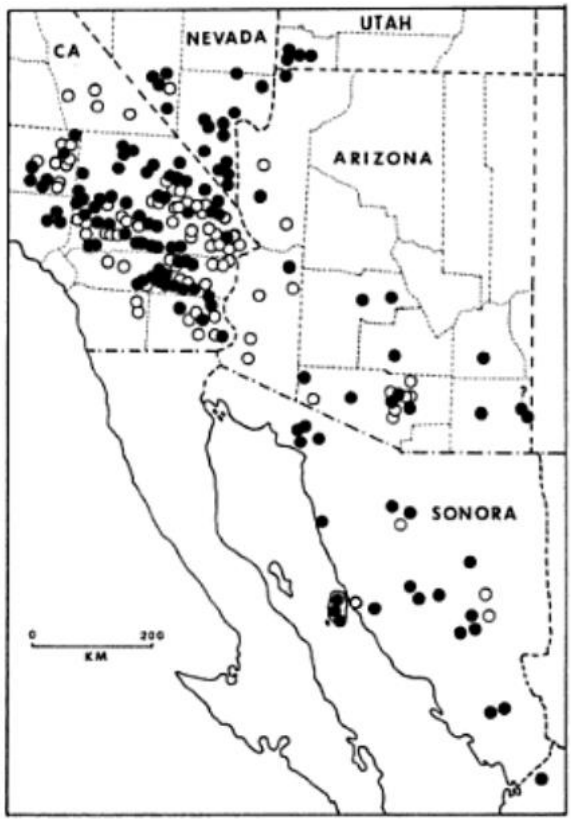

Figure 5. Distribution of desert tortoises from Patterson (1981). Black dots represent museum and literature records, open circles represent observations of professional and amateur herpetologists. Note that records outside of California include tortoises now ascribed to Morafka's desert tortoise and Goode's thornscrub tortoise (*Gopherus evgoodei*).

Conclusion

Information available to the Department indicates that the Mohave desert tortoise range has not changed substantially since it was first documented in the early 1900s. The Petition provides sufficient information to indicate changes in its distribution within the range have occurred in recent years.

Abundance

Scientific Information in the Petition

The Petition discusses the abundance of Mohave desert tortoises on pages 25 to 29.

The Petition restates information presented in the Population Trend section of the Petition, emphasizing that density estimates of adult Mohave desert tortoises in Critical Habitat Units declined by 51.3% from 2004 to 2014 (USFWS 2015); and that density estimates in the Western Mojave Recovery Unit appear to have declined by 85% to 95% since the earliest density information was collected in the late 1970s (USFWS 1994, 2015). The Petition restates that Mohave desert tortoise densities in eight of 10 sampling units are below the estimated minimum viable population density described in the Recovery Plan (USFWS 1994).

Conclusion

The Petition provides sufficient information to indicate substantial reductions in Mohave desert tortoise abundance have occurred in large areas of their range. Additionally, the Petition demonstrates that the abundance of Mohave desert tortoises has continued to decline since the species was listed as threatened in California in 1989.

Life History

Scientific Information in the Petition

The Petition discusses the life history of the Mohave desert tortoise on pages 29 to 31.

The Petition provides a brief overview of the species' physical description, behavior, adaptations to the desert environment, reproductive biology, home range, and genetic diversity within California.

Conclusion

The Petition provides sufficient information on the life history of the Mohave desert tortoise.

Kind of Habitat Necessary for Survival

Scientific Information in the Petition

The Petition discusses Mohave desert tortoise habitat requirements on pages 31 to 33.

The Petition states the required elements of Mohave desert tortoise habitat include sufficient suitable quantity and quality of plants for forage and cover, suitable substrates for burrow and nest sites, and low occurrence of predators. Most such habitat is found on flats and bajadas with soils ranging from sand to sandy gravel, and scattered shrubs with abundant inter-shrub space for growth of herbaceous plants; although tortoises are also found on rocky terrain and slopes in the Mojave region. Where Mohave desert tortoises occur in the Mojave Desert annual precipitation ranges from 10 to 21 cm (3.9 – 7.9 in.) (Germano et al. 1994). Other important requisites of Mohave desert tortoise habitat listed in the Petition include sufficient space for viable populations and protection from disturbance and human activity (USFWS 1994). The Petition describes the vegetation communities used by Mohave desert tortoises by Desert Tortoise Recovery Unit:

- Colorado Desert Recovery Unit
  - Succulent Scrub (*Fouquieria, Opuntia, Yucca*)
  - Blue Palo Verde-Smoke Tree Woodland
  - Creosote Bush Scrub
  - Blue Palo Verde-Ironwood-Smoke Tree Woodland
- Eastern Mojave Recovery Unit
  - Big Galleta-Scrub Steppe
  - Succulent Scrub (*Yucca, Opuntia* spp.)
  - Creosote Bush Scrub
  - Cheesebush Scrub
  - Indian Rice Grass (*Oryzopsis hymenoides*) Scrub-Steppe
- Western Mojave Recovery Unit
  - Saltbush-Allscale (*Atriplex polycarpa*) Scrub
  - Indian Rice Grass Scrub-Steppe
  - Hopsage (*Grayia spinosa*) Scrub
  - Big Galleta Scrub Steppe
  - Cheesebush Scrub
  - Desert Psammophytes
  - Blackbush (*Coleogyne ramosissima*) Scrub

Conclusion

The Petition presents sufficient information on the habitat requirements of the Mohave desert tortoise.

Factors Affecting the Ability to Survive and Reproduce

Scientific Information in the Petition

The Petition discusses factors affecting the ability of Mohave desert tortoise to survive and reproduce on pages 33 to 35. Other information related to threats is discussed in the Population Trend, Geographic Range, Abundance, and Kind of Habitat Necessary for Survival sections.

Petition Figure 2 graphically displays the relationships between the various factors that threaten the ability of Mohave desert tortoises to survive and reproduce. Threats listed include land uses (ranching, mining, agriculture, urbanization, military operations, transportation networks, recreation, and utility corridors), and weather impacts (storms, drought, availability of natural water). These factors work through various pathways to cause mortality, either directly or indirectly, through starvation, predation, habitat loss, dehydration, drowning, crushing, burial, disease, and other mechanisms.

The Petition also presents information on the threat of artificially high predation pressure from subsidized predators (predator populations maintained at artificially high levels due to obtaining some of their food resources for humans or land use changes associated with humans) such as ravens and coyotes, diseases, and effects associated with climate change. Identified climate change impacts included increasing summer high temperatures, more frequent and prolonged drought, decreasing annual precipitation and associated changes in vegetation communities, and decreased availability of nutritious forage plants and shrub cover.

Conclusion

The Petition provides sufficient information regarding the factors affecting the ability of Mohave desert tortoises to survive and reproduce.

Degree and Immediacy of Threat

Scientific Information in the Petition

The Petition generally discusses threats to Mohave desert tortoises on page 36. Additional information on threats affecting desert tortoises is included throughout the Petition, including information on: disease, drought, and predation impacts (p.15); urbanization (p. 22); off-highway vehicle impacts (OHVs, pp. 22, 26, 41); invasive species (p. 22); threats associated with military bases and military training (p. 22); renewable energy facilities (p. 24); roads (pp. 24, 32); human presence and subsidized predators (pp. 26, 27); impacts associated with climate change (pp. 27, 28, 34); grazing (p. 32); and translocations (p. 38).

Conclusion

The Petition provides sufficient information on the threats affecting the Mohave desert tortoise.

Impact of Existing Management Efforts

Scientific Information in the Petition

The Petition discusses the impact of existing management efforts on Mohave desert tortoise populations on pages 36 to 43.

The Petition describes the property ownership pattern of land designated Desert Tortoise Critical Habitat by the USFWS (1994). USFWS designed critical habitat covers 19,239 km2 (4,754,000 ac.) in California. The major landowners, in descending area of ownership, are BLM, private lands, U.S. National Park Service (NPS), U.S. Department of Defense (DOD), and the State of California.

Current land use on BLM lands in the Mohave desert tortoise range is governed by a series of Regional Plans. BLM lands are managed under a multiple use mandate which includes grazing, utility rights of way, off road vehicle recreation, wildlife habitat management, and wilderness and wild and scenic river areas. In recent years, BLM has received numerous applications for renewable energy development projects, totaling tens of thousands of acres. In response to these applications BLM–with support from USFWS, California Energy Commission, and the Department–enacted the Desert Renewable Energy Conservation Plan (DRECP) across 91,054 km^2 (approximately 22.5 million ac.) of southeastern California deserts, a landscape-scale plan for siting renewable energy facilities and preserving environmentally sensitive areas. The siting of these facilities could result in the removal or degradation of up to 4,569 ha (11,290 ac.) of Mohave desert tortoise habitat in the plan area, including 1,916 ha (4,734 ac.) of critical habitat (USFWS 2016). The BLM is currently considering amending the DRECP in response to Executive Order 13783 which directs federal agencies to review regulations that unnecessarily impede energy development (Fed. Reg. 83(23):4921-4922).

NPS lands in the Mohave desert tortoise range include the Mojave National Preserve and Joshua Tree National Park. NPS General Management Plans emphasize the protection of natural and cultural resources.

DOD lands in the Mohave desert tortoise range include China Lake Naval Air Weapons Station, Edwards Air Force Base, Fort Irwin (U.S. Army), Marine Corps Air Ground Combat Center, and the Chocolate Mountains Gunnery Range (U.S. Navy and U.S. Marine Corps). These lands are managed under Integrated Natural Resource Management Plans. Use of the lands includes weapons development, mechanized training, and weapons fire. These uses can result in the loss and fragmentation of habitat but use of the China Lake Naval Air Weapons Station and Edwards Air Force Base largely occurs in air space, with relatively little impact to Mohave desert tortoise habitat.

Private lands in the Mohave desert tortoise range are primarily used for residential and commercial development, agriculture, mining, and open space. Land use practices are governed by city and county general plans.

Conclusion

The Petition describes land ownership and includes a cursory discussion of land management practices by ownership within designated Mohave desert tortoise Critical Habitat Units. However, it does not provide similar information for the species' entire range in California which encompasses an area far greater than the Critical Habitat Units. Nonetheless, the Petition provided sufficient information on the general patterns of land ownership and land management practices in the species' range.

Suggestions for Future Management

Scientific Information in the Petition

The Petition provides suggestions for future management of Mohave desert tortoises on pages 43 to 47, which are summarized below.

- Increase protections for Mohave desert tortoise in BLM Areas of Critical Environmental Concern using the measures proven effective in Desert Tortoise Reserve Natural Areas.
- Implement science-based monitoring of the extent and impact of OHV and grazing uses of BLM lands.
- Amend the California Desert Conservation Plan (BLM 1980) to reduce OHV and grazing uses on BLM lands, and to enforce protective measures.
- State and Federal management agencies should be actively engaged in planning and implementing recovery actions.
- Control ravens in desert tortoise Recovery Units.
- Meet the recovery goals of the USFWS Recovery Plan (1994).

Conclusion

The Petition provides sufficient information regarding suggestions for future management of Mohave desert tortoise and its habitat.

Detailed Distribution Map

Scientific Information in the Petition

The Petition provides links to three websites containing Mohave desert tortoise distribution maps on page 48.

Conclusion

The range maps linked in the Petition are sufficient.

Sources and Availability of Information

Scientific Information in the Petition

The Petition cites an extensive list of sources in Appendix 4.

Other Relevant Scientific Information

The Department used additional sources of scientific information cited in this Petition Evaluation.

Conclusion

The Petition provides sufficient information on the sources and availability of information used in the Petition.

RECOMMENDATION TO THE COMMISSION

Pursuant to Section 2073.5 of the Fish and Game Code, the Department has evaluated the Petition on its face and in relation to other relevant information the Department possesses or received. In completing its Petition Evaluation, the Department has determined that the Petition and other relevant information indicates there is sufficient scientific information to indicate that the petitioned action to change the status of Mohave desert tortoise from threatened to endangered may be warranted. Therefore, the Department recommends the Commission accept the Petition for further consideration under CESA.

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CESA Petition Evaluation:
Mohave Desert Tortoise (*Gopherus agassizii)*

California Fish and Game Commission

October 14, 2020

Daniel Applebee – Wildlife Branch

Outline

- Conservation status
- Petition evaluation process
- Species overview
- Petition evaluation
- Department recommendation

Mohave Desert Tortoise
Conservation Status

- **CESA: Threatened (1989)**
  - Petition to list as Endangered (2020)
- **ESA: Threatened (1990)**
  - *5-Year Review (2010)*
- **Threats Identified:**
  - *Habitat Loss*
  - *Disease*

Petition Evaluation Process

1. Population trend
2. Range
3. Distribution
4. Abundance
5. Life history
6. Habitat
7. Survival and reproduction factors
8. Degree/immediacy of threat
9. Impacts of existing management
10. Suggestions for future management
11. Information sources
12. Detailed distribution map

Species Overview: Taxonomy

- **Order Testudines,**
- **Family Testudinae**

- **Two Species in U.S.:**
  - Mohave/Agassiz's desert tortoise (*G. agassizii)*
  - Morafka's tortoise (*G. morafkai*)

Species Overview: Geographic Range

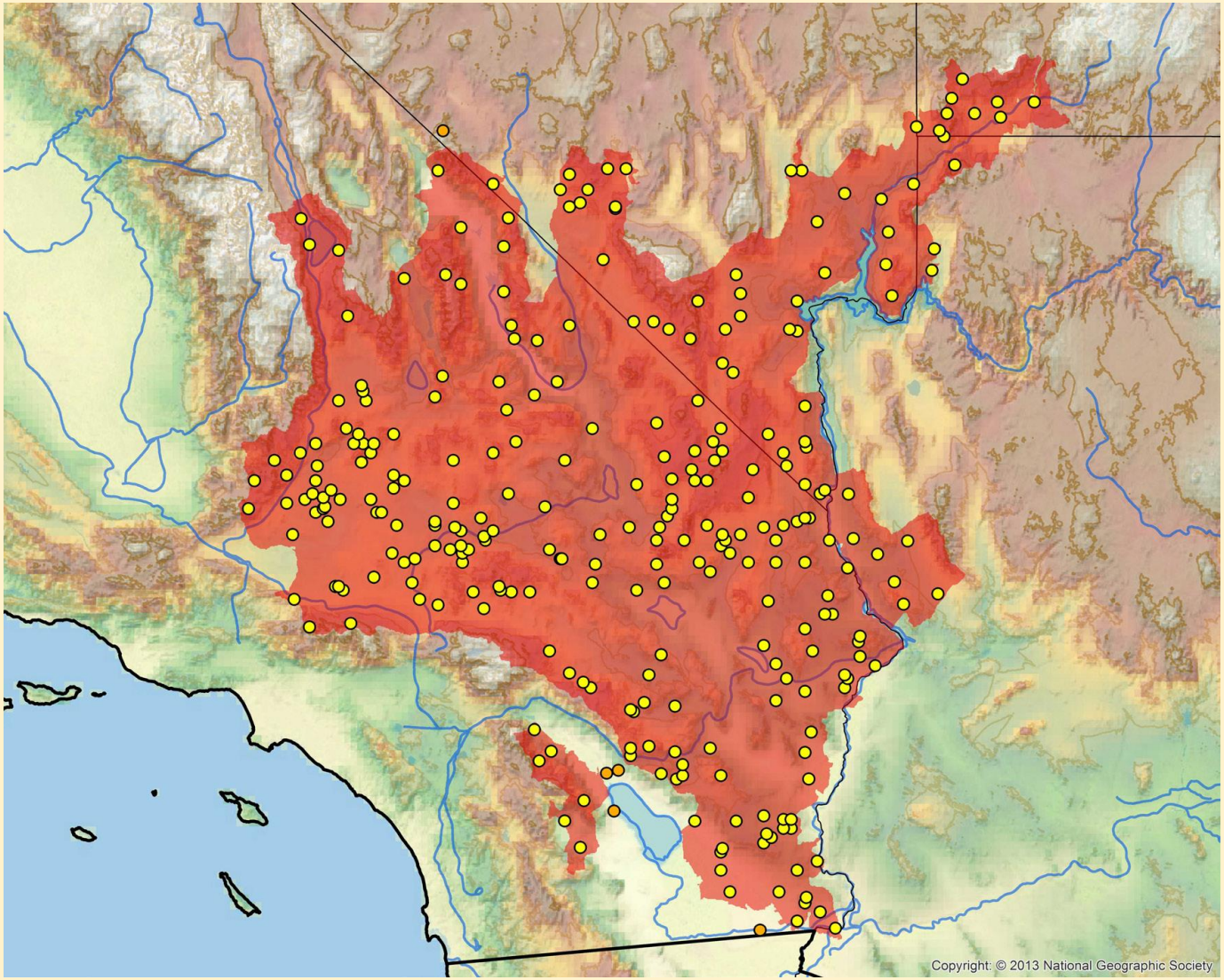


Figure from Berry and Murphy. 2019.

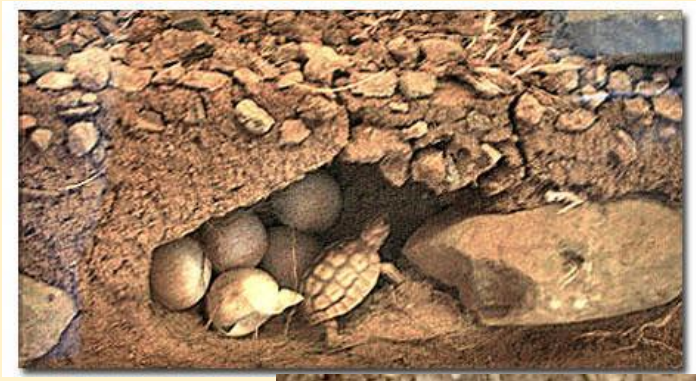
Species Overview: Habitat

- Suitable soils and structure for shelter and burrows

- Shrub cover for shade and foraging

Species Overview: Life History

- Seasonally active
- Long lifespans
- Slow to reach maturity
- Low reproductive rate
- Diet includes wide variety of plants and shrubs

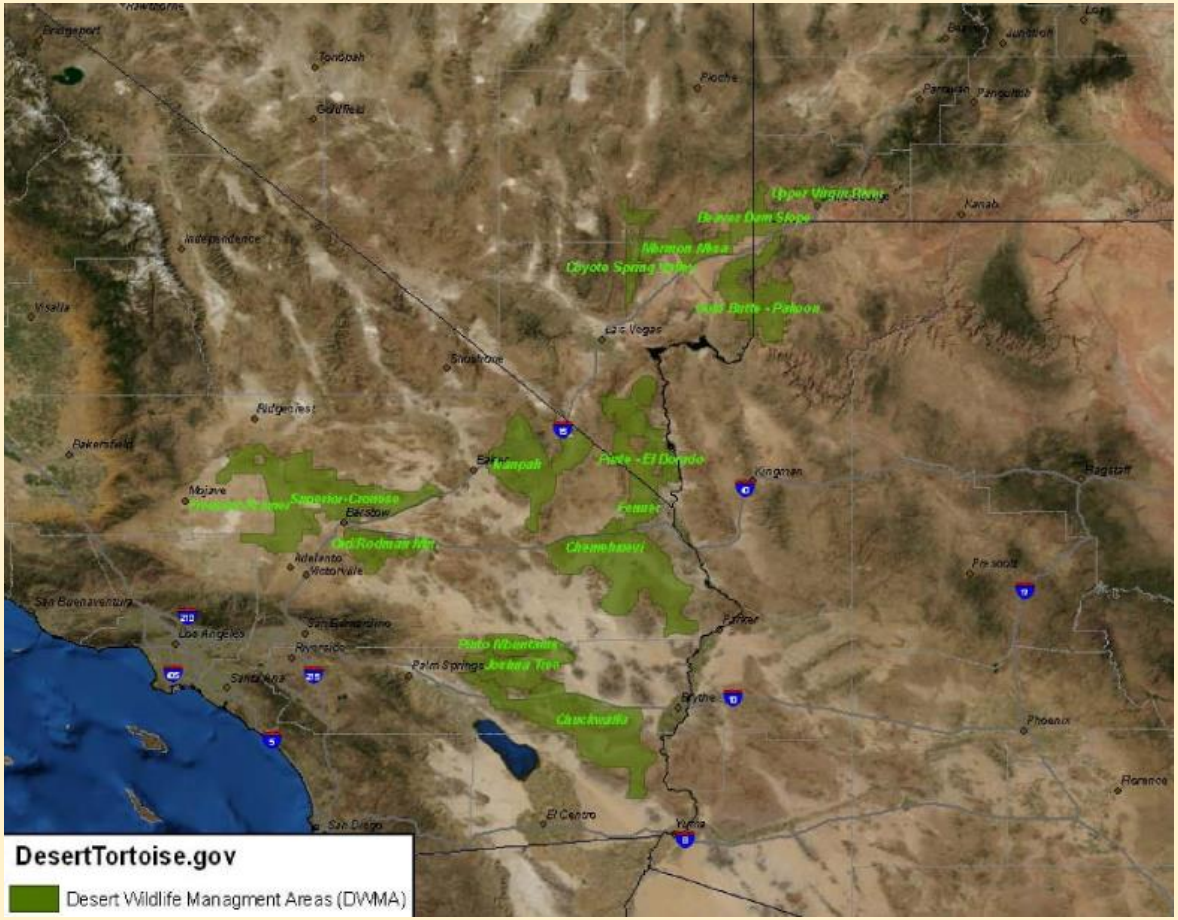


Petition Evaluation

1. Population trend
2. Range
3. Distribution
4. Abundance
5. Life history
6. Habitat
7. Survival and reproduction factors
8. Degree/immediacy of threat
9. Impacts of existing management
10. Suggestions for future management
11. Information sources
12. Detailed distribution map

Petition Evaluation: Population Trend

Abundant long-term population density monitoring data available from regular surveys of Desert Tortoise Wildlife Management Areas beginning in late 1970s.



Petition Evaluation: Population Trend

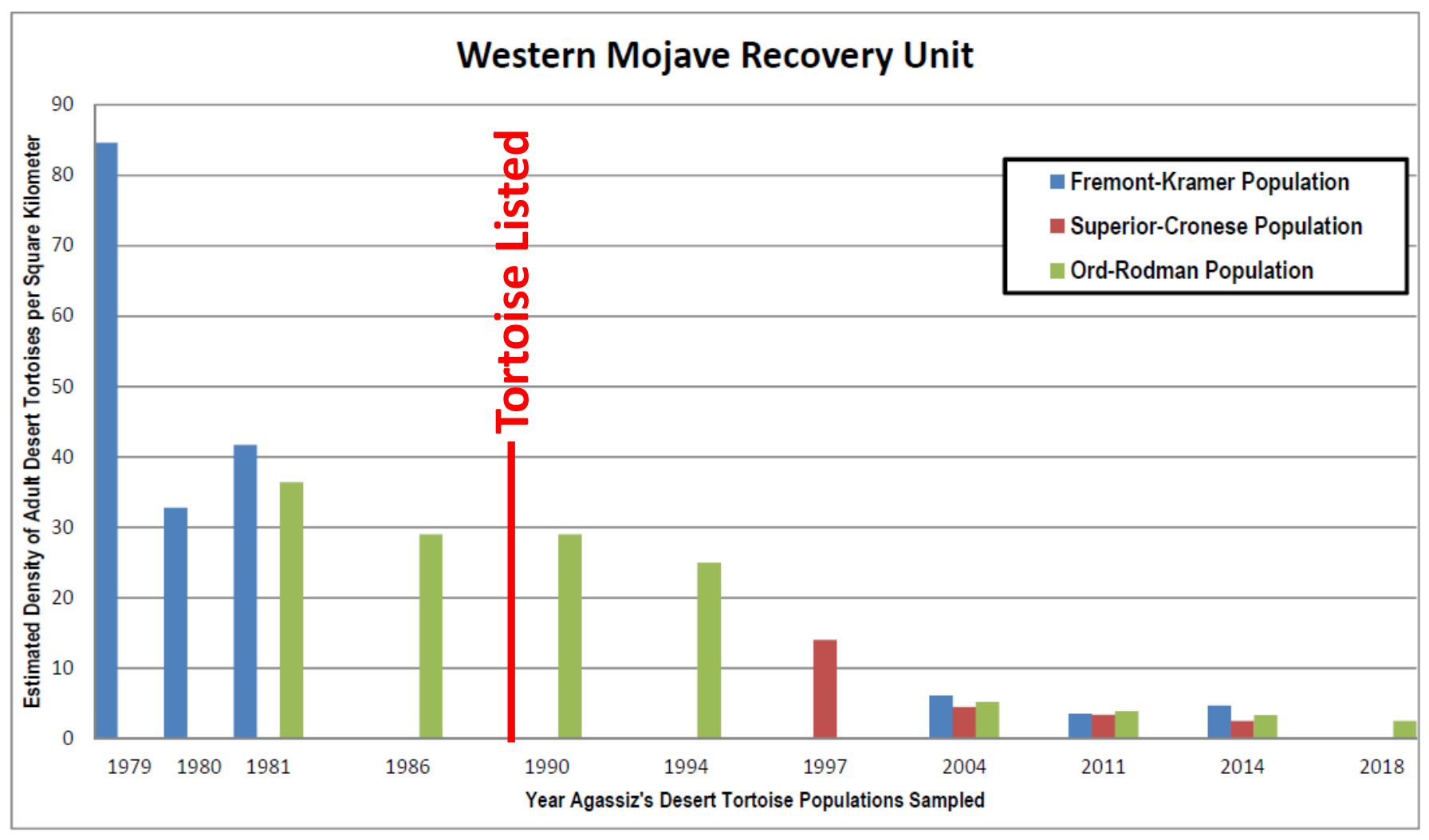
Petition Information:

Population density data for 10 California Desert Tortoise Management Units

- Dramatic declines late 1970s – present
- Declines of up to 50% to 96% in most units
- Declines continued since listed under CESA and ESA

Many Management Units may be below presumed minimum viable population densities

Petition Evaluation: Population Trend Example



Petition Evaluation: Threats

Main threats identified:

- Habitat loss and degradation
- Disturbance
- Artificially high predation rates
- Disease
- Climate change

Petition Evaluation: Existing Management

Petition Information:

- BLM Lands - Multiple Use Mandate
- Department of Defense - Training
- Private Lands - Development and Resource Use
- Translocations

Petition Evaluation: Suggestions for Management

Petition Information:

- Increase protections in BLM Areas of Critical Ecological Concern
- Reduce OHV and grazing impacts and enforce regulations
- Develop recovery plans and implement recovery actions.

Department Recommendation

- The Department has determined the Petition presents sufficient scientific information that the petitioned action to change status from Threatened to Endangered may be warranted.

- The Department recommends the Commission accept the Petition for further consideration under CESA.

Thank You

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California Fish and Game Commission
Potential Agenda Items for December 2020 Commission Meeting

The next Commission meeting is scheduled for December 9-10, 2020. Due to ongoing health concerns related to COVID-19 and state travel restrictions, the meeting will be held by webinar/teleconference. 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 (Department).

Wednesday, December 9: Marine-related and administrative items

1. General public comment for items not on the agenda
2. Executive director's report
3. Receive Department informational items (marine)
4. Tribal Committee
5. Marine Resources Committee
6. Adopt: amend recreational fishing regulations for the take of red and purple sea urchin in Tanker Reef, Monterey County, and the take of purple sea urchin in Caspar Cove, Mendocino County
7. Adopt: amend recreational fishing regulations for the take of red abalone sunset date
8. Adopt: recreational crab marine life protection measures regulations
9. Annual recreational ocean salmon and Pacific halibut regulations: Update on the Pacific Fishery Management Council process and timeline, and automatic conformance to federal regulations
10. Receive annual report on Department Statewide Marine Protected Areas Program management activities
11. Marine items of interest from previous meetings
12. Action on marine petitions for regulation change
13. Action on marine non-regulatory requests from previous meetings
14. Executive (closed) session

Thursday, December 10: Wildlife- and inland fisheries-related and administrative items

15. General public comment for items not on the agenda
16. Receive Department informational items (wildlife and inland fisheries)
17. Wildlife Resources Committee
18. Receive the Department's five-year status review for California bighorn sheep (also known as Sierra Nevada bighorn sheep) under CESA
19. Receive the Department's five-year status review for Owens tui chub under CESA
20. Receive the Department's 90-day evaluation report for the petition to list Quino checkerspot butterfly as a threatened or endangered species under CESA
21. Determine whether the petitioned action to list upper Klamath Trinity river spring Chinook salmon as a threatened or endangered species under CESA is warranted
22. Notice: amend Klamath River Basin sport fishing regulations (annual)

23. Notice: amend Central Valley sport fishing regulations (annual)
24. Notice: amend waterfowl hunting regulations (annual)
25. Notice: amend mammal hunting regulations to adjust deer and antelope tags and big game license tag drawing
26. Wildlife and inland fisheries items of interest from previous meetings
27. Action on wildlife and inland fisheries petitions for regulation change
28. Action on wildlife and inland fisheries non-regulatory requests from previous meetings
29. Administrative items (next meeting agenda, rulemaking timetable, new business)

State of California
Department of Fish and Wildlife

M e m o r a n d u m

Date: October 6, 2020 (Received by FGC on Oct 6, 2020)

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham (Signed original on file)
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 change to the Fish and Game Commission's (Commission's) 2020 regulatory timetable:

- Add a rulemaking to add Section 708.19 Preference Point Reinstatement and Tag Fee Refund and amend sections 360 Deer and 363 Pronghorn Antelope, Title 14, CCR. The rulemaking to add Section 708.19 is necessary to reinstate elk and pronghorn antelope preference points and partially refund fees paid to hunters who were unable to use their drawn tags in 2020 due to fire-related forest closures. The amendments to sections 360, and 363 will adjust deer and pronghorn antelope tag quotas in areas where CDFW long-term datasets indicate population declines.
    - The proposed meeting schedule is notice at the December 2020 meeting.

- Add a rulemaking to amend Section 632, Marine Protected Areas, Marine Managed Areas, and Special Closures, Title 14, CCR, to allow for maintenance of pre-existing artificial structures within State Marine Conservation Areas. This rulemaking is necessary to allow for permitted maintenance and/or repair needs of structures that were installed prior to Marine Protected Area designation by the Commission. This rulemaking is a priority to address in the near-term due to immediate maintenance and repair needs for select structures that need to be permitted prior to an emergency or threat to public health and safety.
    - The proposed meeting schedule is notice at the February 2021 meeting, discussion at the April 2021, and adoption at the June 2021 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

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California Fish and Game Commission: Perpetual Timetable for Anticipated Regulatory Actions

Updated October 7, 2020

Items proposed for change are shown in blue underlined font

Regulatory Change Category	Title 14 Section(s)	FGC Webinar/Teleconference Oct 14, 2020	TC Webinar/Teleconference Nov 9, 2020	MRC Webinar/Teleconference Nov 10, 2020	FGC Webinar/Teleconference Dec 9, 2020	FGC Webinar/Teleconference Dec 10, 2020	FGC Webinar/Teleconference Jan 12, 2021	WRC Webinar/Teleconference Jan 12, 2021	FGC Webinar/Teleconference Feb 10, 2021	FGC Webinar/Teleconference Feb 11, 2021	MRC Webinar/Teleconference Mar16, 2021	TC Webinar/Teleconference Apr 13, 2021	FGC Webinar/Teleconference Apr 14, 2021	FGC Webinar/Teleconference Apr 15, 2021	FGC Webinar/Teleconference May 11, 2021	WRC Webinar/Teleconference May 11, 2021	FGC Webinar/Teleconference Jun 16, 2021	FGC Webinar/Teleconference Jun 17, 2021	MRC Sacramento Jul 20, 2021	TC Sacramento Aug 17, 2021	FGC Sacramento Aug 18, 2021	FGC Sacramento Aug 19, 2021	WRC Sacramento Sep 16, 2021
Central Valley Sport Fishing (Annual)	7.50(b)(4), (43), (66), (80)					N			D				D		A					E 8/1			
Klamath River Basin Sport Fishing (Annual)	7.40(b)(50)					N			D				D		A					E 8/1			
Waterfowl (Annual)	502					N			D				A						E 7/1				
Mammal Hunting - Deer and Antelope tag adjustments, and big game license tag drawing	360, 363, 708.19					N	D		A				E 4/1										
Marine Protected Areas (MPAs), Marine Managed Areas (MMAs), and Special Closures	632									N				D				A					
Commercial Pacific Herrintg Eggs on Kelp (Fishery Management Plan Implementation)	163, 164				E 11/30																		
Groundfish	27.30, 27.35, 27.45, 28.27, 28.28, 28.54, 28.55, 28.65, 150.16	A						E 1/1															
Simplification of Statewide Inland Fishing Regulations [3]	3.00, 4.00, 5.00, 5.41, 5.84, 5.86, 5.89, 7.00, 7.40, 7.50, 8.10	A									E 3/1												
Recreational Crab Marine Life Protection Measures	29.80, 29.85 701	D			A						E 3/1												
Recreational Take of Red Abalone	29.15	D			A								E 4/1										
Recreational take of Sea Urchin at Caspar Cove and Tanker Reef regulations [5]	29.06	D			A							E 3/1											
Recreational Purple Sea Urchin emergency regulations (120 day extension)	29.06								EE 1/12														

Rulemaking Schedule to be Determined	Title 14 Section(s)	FGC Webinar/Teleconference Oct 14, 2020	TC Webinar/Teleconference Nov 9, 2020	MRC Webinar/Teleconference Nov 10, 2020	FGC Webinar/Teleconference Dec 9, 2020	FGC Webinar/Teleconference Dec 10, 2020	FGC Webinar/Teleconference Jan 12, 2021	WRC Webinar/Teleconference Jan 12, 2021	FGC Webinar/Teleconference Feb 10, 2021	FGC Webinar/Teleconference Feb 11, 2021	MRC Webinar/Teleconference Mar16, 2021	TC Webinar/Teleconference Apr 13, 2021	FGC Webinar/Teleconference Apr 14, 2021	FGC Webinar/Teleconference Apr 15, 2021	FGC Webinar/Teleconference May 11, 2021	WRC Webinar/Teleconference May 11, 2021	FGC Webinar/Teleconference Jun 16, 2021	FGC Webinar/Teleconference Jun 17, 2021	MRC Sacramento Jul 20, 2021	TC Sacramento Aug 17, 2021	FGC Sacramento Aug 18, 2021	FGC Sacramento Aug 19, 2021	WRC Sacramento Sep 16, 2021
CA Grunnion (FGC Petition #2019-014)	TBD																						
~~Mammal Hunting~~	~~TBD~~																						
Commercial Kelp and Algae Harvest Management	165, 165.5, 705																						
Santa Cruz Harbor Salmon Fishing (FGC Petition #2016-018)	TBD																						
European Green Crab (FGC Petition #2017-006)	TBD																						
Wildlife Areas/Public Lands [4]	TBD																						
Experimental Fishing Permit (EFP) Program Phase II)	TBD																						
Possess Game / Process Into Food	TBD																						
American Zoological Association / Zoo and Aquarium Association	671.1																						
Night Hunting in Gray Wolf Range (FGC Petition #2015-010)	474																						
Shellfish Aquaculture Best Management Practices	TBD																						
Ban of Neonicotinoid Pesticides on Department Lands (FGC Petition #2017-008)	TBD																						
Commercial Pink Shrimp Trawl	120, 120.1, 120.2																						
Ridgeback Prawn Incidental Take Allowance	120(e)																						

FGC = California Fish and Game Commission MRC = FGC Marine Resources Committee WRC = FGC Wildlife Resources Committee TC = FGC Tribal Committee
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
3 = Includes FGC Petition #2018-008 4 = Includes FGC Petition #2018-003 5 = Includes FGC Petition #2020-001

SUPERIOR COURT OF CALIFORNIA

COUNTY OF SACRAMENTO

DATE/TIME JUDGE	September 18, 2020 HON. SHELLEYANNE W. L. CHANG	DEPT. NO CLERK	21 E. HIGGINBOTHAM
AARON LANCE NEWMAN, Petitioner, v. CALIFORNIA FISH AND GAME COMMISSION, and DOES 1 through 50, Respondents.		Case No.: 34-2018-80002944	
Nature of Proceedings:	RULING ON SUBMITTED MATTER RE: MOTION FOR SUMMARY JUDGMENT		

This matter came on for hearing on September 15, 2020. Having considered the filings and arguments of the parties, the Court now rules as set forth herein. For ease of review, the Court has restated its tentative ruling, but rules as stated in its "final ruling" section.

A. TENTATIVE RULING

I. DISCUSSION

A. Evidentiary Objections

Respondent has filed evidentiary objections to the declarations submitted in support of the motion for summary judgment. Respondent has failed to comply with California Rule of Court Rule 3.1354's requirement that each objection be numbered consecutively. The Court will refer to the objections as though they had been properly numbered. Objections 1, 8, 9, 10, and 11 are **SUSTAINED**. Objections 2-7 are moot, and objections 12 and 13 are **OVERRULED**.

B. Procedural Objection

Respondent argues this motion is procedurally deficient because Respondent has not yet made a general appearance in this matter, and is not required to file a responsive pleading until after the administrative record is lodged. Code of Civil Procedure section 437c(a)(1) provides,

> A party may move for summary judgment in an action or proceeding if it is contended that the action has no merit or that there is no defense to the action or proceeding. The motion may be made at any time after 60 days have elapsed

since the general appearance in the action or proceeding of each party against whom the motion is directed or at any earlier time after the general appearance that the court, with or without notice and upon good cause shown, may direct.

Petitioner argues this argument is without merit because Petitioner's motion is based on the fact that Respondent "has not and cannot provide a court reporter transcript of electronic record of the Administrative hearing and such a record is a vital aspect of the necessary Administrative Record and a matter of due process right." (Reply, p. 1.) Petitioner argues Respondent has acknowledged that this argument *is* procedurally ripe for a motion for summary judgment and cites to Respondent's opposition which states, "...except for the challenge based on the unavailability of the reporter's transcript, which arose after the hearing, summary judgment is not available..." (Oppo., p. 10.)

While the Court agrees with Respondent that Petitioner's remaining arguments concerning the validity of the underlying administrative decision are not properly raised prior to Respondent's general appearance, the Court finds Petitioner is entitled at this time to raise argument concerning the unavailability of a complete administrative record.

C. <u>The missing transcript</u>

The parties agree that the following facts are undisputed. On July 3, 2018, Respondent revoked Petitioner's hunting and fishing privileges, which decision was rendered after a hearing conducted by an administrative law judge. The reporter's transcript for the administrative hearing is now "unavailable" as the court reporter has failed to produce the transcript for the hearing.

The question before the Court for purposes of the instant motion is whether Petitioner's due process rights have been violated because there is no reporter's transcript contained within the administrative record. Title 14 of the California Code of Regulations contains the provisions applicable to Respondent. Section 746 concerns the procedures for license or permit revocations, and provides,

> "...the commission...shall comply with the following minimum safeguards to afford each applicant, licensee or permittee procedural and substantive due process when the commission considers revocation, suspension, transfer, reinstatement or waiver of renewal requirements for a license or permit including hunting and sport fishing license or permit privileges.
>
> (a) In the case where the applicant, licensee or permittee has already been convicted of a violation of the Fish and Game Code or any regulation pertaining to the activity licensed or permitted by said code, the commission shall comply with the following:
>
> ...
>
> (4) The proceedings of the hearing *shall be recorded by a court reporter* or an electronic tape recording system.

> (12) The applicant, licensee or permittee may request judicial review by filing a petition for writ of mandate in accordance with provisions of the Code of Civil Procedure within 30 days from the date of service (postmark) of the order. *The record of the proceedings as designated by the petitioner shall be prepared by the commission and delivered to petitioner's counsel* or, if appearing pro se, the petitioner within 30 days after petitioner's request and upon payment of the fee specified in Section 69950 of the Government Code. (Emphasis added.)

Petitioner argues the failure of Respondent to provide a copy of the court reporter's transcript, even if such a failure is due to circumstances beyond Respondent's control, is a clear violation of section 746(a)(4) and is a violation of Petitioner's right to due process. Respondent argues the absence of the transcript is due to a "rogue reporter" and that the transcript is not necessary because Respondent was not "statutorily required to rely on the transcript because it adopted the proposed decision in its entirety." (Oppo., p. 22.)

These arguments turn on statutory interpretation and construction. The interpretation of statutes is an issue of law on which the court exercises its independent judgment. (See, *Sacks v. City of Oakland* (2010) 190 Cal.App.4th 1070, 1082.) In exercising its independent judgment, the Court is guided by certain established principles of statutory construction, which may be summarized as follows. The primary task of the court in interpreting a statute is to ascertain and effectuate the intent of the Legislature. (See, *Hsu v. Abbara* (1995) 9 Cal.4th 863, 871.) This extends to a challenge that a regulation exceeds the agency's authority, although the Court gives great weight to the agency's interpretation. (*Nick v. City of Lake Forest* (2014) 232 Cal.App.4th 871.)

The starting point for the task of interpretation is the words of the statute itself, because they generally provide the most reliable indicator of legislative intent. (See, *Murphy v. Kenneth Cole Productions* (2007) 40 Cal.4th 1094, 1103.) The language used in a statute is to be interpreted in accordance with its usual, ordinary meaning, and if there is no ambiguity in the statute, the plain meaning prevails. (See, *People v. Snook* (1997) 16 Cal.4th 1210, 1215.) The court should give meaning to every word of a statute if possible, avoiding constructions that render any words surplus or a nullity. (See, *Reno v. Baird* (1998) 18 Cal.4th 640, 658.) Statutes should be interpreted so as to give each word some operative effect. (See, *Imperial Merchant Services, Inc. v. Hunt* (2009) 47 Cal.4th 381, 390.)

Beyond that, the Court must consider particular statutory language in the context of the entire statutory scheme in which it appears, construing words in context, keeping in mind the nature and obvious purpose of the statute where the language appears, and harmonizing the various parts of the statutory enactment by considering particular clauses or sections in the context of the whole. (See, *People v. Whaley* (2008) 160 Cal.App.4th 779, 793.)

Section 746(a)(4) does not have any language to suggest that a transcript or recording is only required if the Commission fails to adopt the ALJ's proposed decision in its entirety, as Respondent suggests. The plain language provides that the hearing "*shall be recorded*" and in this case Respondent acknowledges that no such recording has ever been produced and will not

ever be produced. Further, subdivision (a)(12) provides that the record of proceedings "as designated by the petitioner *shall be prepared by the commission*" and here, Petitioner is being deprived of the ability to include the reporter's transcript as part of the record of proceedings because such a transcript does not exist. While the Court acknowledges that the failure to produce a transcript does not appear to be Respondent's "fault," such a fact does not change the fact that compliance with subdivision (a)(4) and (a)(12) did not and cannot occur. Accordingly, pursuant to section 746, Respondent failed to provide the "minimum safeguards" to afford Petitioner substantive due process.

II. CONCLUSION

Petitioner's requested remedy is that the Order of Decision be "vacated with prejudice." However, such a remedy is inappropriate. Respondent argues the appropriate remedy would be to "reconstruct the missing record or remand for a new hearing if that is not possible." (Oppo., p. 23)(citing *Chavez. v. Civil Service Com.* (1978) 86 Cal.App.3d 324, 332.) The Court finds that Petitioner's requested remedy is inappropriate for the circumstances. The motion for summary judgment is **GRANTED** and the Order of Decision is **VACATED WITHOUT PREJUDICE**. Going forward, the parties are free to avail themselves of the remedies articulated in *Chavez*. A judgment shall be issued in favor of Petitioner, and against Respondent, and a peremptory writ shall issue commanding Respondent to take action specially enjoined by law in accordance with the Court's ruling, but nothing in the writ shall limit or control in any way the discretion legally vested in Respondents. Respondent shall make and file a return within 60 days after issuance of the writ, setting forth what has been done to comply therewith.

B. FINAL RULING

At the hearing on this matter, Respondent reiterated that it has not yet made a general appearance in this matter, and as such, the motion for summary judgment is procedurally defective. The Court notes that Respondent did not file its opposition to the motion as part of a "special appearance" and did not note that counsel was making a "special appearance" as part of oral argument on this motion. While Respondent filed a procedural objection to the motion, Respondent also opposed the motion on the merits. In addition, on February 18, 2020, counsel for Respondent signed a stipulation to continue the hearing on the motion for summary judgment, which continuance the Court subsequently ordered. Lastly, Respondent opposed the ex parte application for a stay order on the merits of the application.

Pursuant to Code of Civil Procedure section 1014,

> A defendant appears in an action when the defendant answers, demurs, files a notice of motion to strike, files a notice of motion to transfer pursuant to Section 396b, moves for reclassification pursuant to Section 403.040, gives the plaintiff written notice of appearance, or when an attorney gives notice of appearance for the defendant.

"[I]t is the general rule that if an appearance is for any purpose other than to question the jurisdiction of the court, it is general." (*Pfeiffer v. Ash* (1949) 92 Cal.App.2d 102, 104.) If a party

appears and "objected only to the consideration of the case, or to any procedure on it, because the court has not acquired jurisdiction of the person of the defendant, the appearance is special...On the other hand, if he appears and asks for any relief which could only be given to a party in a pending case, or which itself would be a regular proceeding in the case, it is a general appearance..." (*Milstein v. Ogden* (1948) 84 Cal.App.2d 229, 232.) "The list of acts constituting an appearance set forth in Code of Civil Procedure section 1014...is not exclusive. Instead, the determining factor is whether defendant takes a part in the particular action which in some manner recognizes the authority of the court to proceed." (*Sierra Club v. Napa County Bd. of Supervisors* (2012) 205 Cal.App.4th 162, 171)(citations omitted.) In *Sierra Club*, the First District Court of Appeal determined the county had made a general appearance by "stipulating in writing to an order granting Sierra Club a 60-day extension to prepare the administrative record. That action acknowledged the authority of the court to grant the extension..." (*Id.* at 172.) The court found such action "waived any irregularities." (*Id.*)

Respondent has clearly made a general appearance in this matter. Such general appearance occurred first on February 7, 2020, when Respondent filed an opposition to the motion for summary judgment that included arguments going to the merits of the motion, not just an objection to the Court's jurisdiction. Respondent again made a general appearance on February 18, 2020, when the stipulation to continue the hearing on the motion was filed, having been signed by Respondent. Although these actions occurred subsequent to Petitioner's filing of the motion for summary judgment, such a motion is deemed to have been "made" at the hearing for purposes of the 60-days identified in Code of Civil Procedure section 437c. (*Sadlier v. Superior Court* (1986) 184 Cal.App.3d 1050.) Here, the hearing on this motion took place on September 15, 2020, a more than 60-days after Respondent made its general appearance in February 2020. Accordingly, the Court finds the motion for summary judgment is timely pursuant to Code of Civil Procedure section 437c.

The Court further notes that while Respondent repeatedly argued that *Chavez* mandates the Court order the parties to attempt to reconstruct the record, such an order is contraindicated in this matter by California Code of Regulations title 14, Section 746,

> ...the commission...shall comply with the following minimum safeguards to afford each applicant, licensee or permittee procedural and substantive due process when the commission considers revocation, suspension, transfer, reinstatement or waiver of renewal requirements for a license or permit including hunting and sport fishing license or permit privileges.
>
> (b) In the case where the applicant, licensee or permittee has already been convicted of a violation of the Fish and Game Code or any regulation pertaining to the activity licensed or permitted by said code, the commission shall comply with the following:
>
> ...
>
> (4) The proceedings of the hearing *shall be recorded by a court reporter* or an electronic tape recording system.

> (12) The applicant, licensee or permittee may request judicial review by filing a petition for writ of mandate in accordance with provisions of the Code of Civil Procedure within 30 days from the date of service (postmark) of the order. *The record of the proceedings as designated by the petitioner shall be prepared by the commission and delivered to petitioner's counsel* or, if appearing pro se, the petitioner within 30 days after petitioner's request and upon payment of the fee specified in Section 69950 of the Government Code. (Emphasis added.)

Respondent failed to provide the "minimum safeguards" to afford Petitioner substantive due process by failing to comply with this regulation. As such, any attempt to "reconstruct the administrative record" that falls short of providing Petitioner with a "record of the proceedings as designated by Petitioner" is insufficient. While the Court recognizes this finding differs from *Chavez*, the facts in *Chavez* did not involve a regulation explicitly requiring the recording of the proceedings and an affirmative duty on the part of Respondent, and therefore the remedy of reconstructing the record was, and remains, a factual possibility and not a legally deficient option.

Because the Order of Decision was based upon an incomplete administrative record and thus incapable of a meaningful review by the Court, the Order of Decision must be set aside. (*Aluisi v. County of Fresno* (1958) 159 Cal.App. 2d 823).

The motion for summary judgment is **GRANTED** and the Order of Decision is **VACATED WITHOUT PREJUDICE**. A judgment shall be issued in favor of Petitioner, and against Respondent, and a peremptory writ shall issue commanding Respondent to take action specially enjoined by law in accordance with the Court's ruling, but nothing in the writ shall limit or control in any way the discretion legally vested in Respondents. Respondent shall make and file a return within 60 days after issuance of the writ, setting forth what has been done to comply therewith.

SUPERIOR COURT OF CALIFORNIA, COUNTY OF SACRAMENTO

Gordon D Schaber Courthouse
720 Ninth STREET
Sacramento, CA 95814-1311

SHORT TITLE: Newman vs. California Fish and Game Commission

CLERK'S CERTIFICATE OF SERVICE BY MAIL (Minute Order)	CASE NUMBER: **34-2018-80002944-CU-WM-GDS**

I certify that I am not a party to this cause. I certify that a true copy of the Minute Order was mailed following standard court practices in a sealed envelope with postage fully prepaid, addressed as indicated below. The mailing and this certification occurred at Sacramento, California, on 09/21/2020.

Clerk of the Court, by: /s/ E. Higginbotham, Deputy

NHU Q NGUYEN
DEPUTY ATTORNEY GENERAL
PO BOX 944255
SACRAMENTO, CA 94244-2550

PAUL A BRISSO
THE MITCHELL LAW FIRM LLP
P.O.BOX 1008
EUREKA, CA 95502

CLERK'S CERTIFICATE OF SERVICE BY MAIL

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834-1997
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

CERTIFIED MAIL

April 29, 2020

Mr. Robert J. Silva

[redacted]

SUBJECT: **NOTICE OF DENIAL FOR REINSTATEMENT OF NONTRANSFERABLE LOBSTER OPERATOR, PERMIT NUMBER LON048**

Dear Mr. Silva:

This letter is in response to your request to reinstate your Nontransferable Lobster Operator Permit (NTLOP).

Authority-Lobster Operator Permit
Pursuant to California Code of Regulations (CCR), Title 14, Section 122(b)(4), applications for renewals of transferable and non-transferable lobster operator permits must be received by the California Department of Fish and Wildlife (Department) or, if mailed, postmarked no later than April 30 of each year. Late fees, late fee deadlines, and late renewal appeal provisions are specified in Fish and Game Code (FGC) Section 7852.2. Any person denied a permit under CCR, Title 14, Section 122(b)(4) may submit a written request for an appeal to the California Fish and Game Commission (Commission) explaining why their permit request should not be denied. Such requests must be received by the Commission within 60 days of the Department's denial.

Authority-Late Renewal Applications
FGC Section 7852.2(a) establishes a graduated late fee for any renewal application that is received after the deadline.

FGC Section 7852.2(b) states the Department shall not waive the applicable late fee. Additionally, FGC Section 7852.2(c) requires the Department to deny any application for renewal received after March 31 of the permit year following the year in which the applicant last held a valid permit for that fishery.

Reason for Appeal to the Department
In your letter dated April 10, 2020, you stated that you attempted to renew your permit at a Department office but were unable to do so because the office was closed to the public as a result of the Coronavirus pandemic. You also stated that you attempted to pay for your renewal over the phone but were told you could not do so. By the time your nephew was available to assist you with renewing your permit online, the March 31 deadline had already passed. You also stated that your intent was to make your permit active as part of your retirement plan.

Department Findings
Department license records show that you last held a valid NTLOP during the 2018-2019 permit year, which made you eligible to renew the permit for the 2019-2020 permit year.

Department Determination
Based on the previously stated information, your request to reinstate your NTLOP is denied, because you last held a valid NTLOP in the 2018-2019 permit year. The Department received your request for reinstatement on April 17, 2020. FGC Section 7852.2(c) requires the Department to deny any application for renewal received after March 31 of the permit year following the year in which the applicant last held a valid permit for that fishery.

Deadline to File an Appeal to the Fish and Game Commission
If you wish to appeal the Department's decision, you must submit a written appeal to the Commission either by mail at P.O. Box 944209, Sacramento, CA 94244-2090, or by email at fgc@fgc.ca.gov. Pursuant to FGC Section 7852.2(d), your written appeal must be received within 60 days of the date of this letter. The Commission, upon consideration of the appeal, may grant the renewal of the NTLOP. If the Commission grants the renewal, it shall assess the applicable late fees, which amount to $2,581.34. A fee schedule is enclosed.

If you have any questions or require further assistance, please contact Ms. Genalyn Lobel at (916) 928-5816 or Genalyn.Lobel@wildlife.ca.gov.

Sincerely,

Joshua Morgan, Chief
License and Revenue Branch

cc: Ms. Melissa Miller-Henson
Fish and Game Commission
Sacramento, CA

Ms. Genalyn Lobel
California Department of Fish and Wildlife
Sacramento, CA

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834-1997
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

April 29, 2020

Mr. Robert J. Silva (L54695)
Fees Required for Reinstatement of a
Nontransferable Lobster Operator Permit (NTLOP)
Permit Number LON048

Prior Year Fees		**Permit Fees**
2019-2020	Resident Commercial Fishing License	$145.75
	NTLOP	$820.50
	Late Fee (61 days to March 31, 2019)	$627.50
Prior Year Fees Due		**$1,593.75**

Prior Year permit fees must be paid before a 2020-2021 NTLOP can be issued.

Current Year Fees		
2020-2021	Resident Commercial Fishing License	$149.09
	NTLOP	$838.50
Total Current Fees		**$987.59**
Total Fees Due		**$2,581.34**

If the Fish and Game Commission grants the renewal of the permit, payment of $2,581.34 would be due.

Conserving California's Wildlife Since 1870

From: Jay Silva [redacted]@gmail.com>
Sent: Thursday, June 4, 2020 04:11 PM
To: FGC <FGC@fgc.ca.gov>
Subject: Appeal for NTLOP

Warning: This email originated from outside of CDFW and should be treated with extra caution.

To whom it may concern,

My name is Robert J. Silva, I am requesting an appeal for your decision for renewing my NTLOP. The permit number is, L54695. Do you to the COVID-19 epidemic I was unable to send in my fees on time.. as I am not good with computers I requested the help of my nephew to pay it unfortunately time lapses and I was late to make payment.

Based on my renewal fee payment history you can see I have almost never missed a payment. I am requesting to pay all fees and have my permit reinstated.

I am greatly appreciative of you taking the time to read this. I am happy to meet with you at any time to discuss this matter further...

Respectfully,
Robert J. Silva

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

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

October 2, 2020

California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090
FGC@FGC.Ca.Gov

Re: *In the Matter of Robert Silva*; Agency Case No. 20ALJ06-FGC

Dear Commissioners:

This letter is in response to Robert Silva's request to appeal the Department of Fish and Wildlife's ("Department") denial of his request to renew his Lobster Operator Permit, #LON048 ("LOP"). The LOP was last valid during the 2018-19 fishing year. The Department will not be participating in this appeal and accordingly, does not object to the renewal of the LOP for the 2020-2021 fishing year, provided that he pays all applicable fees.

The fees that Mr. Silva must pay to renew the LOP are described in Fish and Game Code, section 7852.2 ("Section 7852.2"), subdivision (a). Section 7852.2, subdivision (a) states:

> (a) In addition to the base fee for the license, stamp, permit, or other entitlement, the department shall assess a late fee for any renewal the application for which is received after the deadline, according to the following schedule:
> (1) One to 30 days after the deadline, a fee of one hundred twenty-five dollars ($125).
> (2) Thirty-one to 60 days after the deadline, a fee of two hundred fifty dollars ($250).
> (3) Sixty-one days or more after the deadline, a fee of five hundred dollars ($500).

To emphasize that these fees must be paid, Section 7852.2, subdivision (b) states that "The department shall not waive the applicable late fee," while subdivision (d) states "If the commission grants renewal, it shall assess the applicable late fee pursuant to subdivision (a)." The fees total $**2,581.34** (see attached fee schedule).

If you have any questions please contact me at the address above or by e-mail at David.Kiene@Wildlife.Ca.Gov.

Sincerely,

DocuSigned by:
David Kiene
A0254C8AA9A1D455...
DAVID KIENE
Senior Staff Counsel

Cc: Robert Silva

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834-1997
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

April 29, 2020

Mr. Robert J. Silva (L54695)
Fees Required for Reinstatement of a
Nontransferable Lobster Operator Permit (NTLOP)
Permit Number LON048

Prior Year Fees		**Permit Fees**
2019-2020	Resident Commercial Fishing License	$145.75
	NTLOP	$820.50
	Late Fee (61 days to March 31, 2019)	$627.50
Prior Year Fees Due		**$1,593.75**

Prior Year permit fees must be paid before a 2020-2021 NTLOP can be issued.

Current Year Fees		
2020-2021	Resident Commercial Fishing License	$149.09
	NTLOP	$838.50
Total Current Fees		**$987.59**
Total Fees Due		**$2,581.34**

If the Fish and Game Commission grants the renewal of the permit, payment of $2,581.34 would be due.

Conserving California's Wildlife Since 1870

State of California – Natural Resources Agency
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License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Certified Mail

August 10, 2020

Mr. Nicholas B. Perrone
[redacted]

Subject: **NOTICE OF DENIAL FOR REINSTATEMENT OF SALMON VESSEL PERMIT, PERMIT NUMBER SA0053**

Dear Mr. Perrone:

This letter is in response to your request to reinstate the Salmon Vessel Permit (SVP), Permit Number SA0053, for the F/V *Julie Ann* (FG00850).

Authority-Salmon Vessel Permit
Fish and Game Code (FGC) Section 8235(a) states that the owner of a permitted vessel, or that owner's agent, may apply for renewal of the permit annually on or before April 30, upon payment of the fees without penalty. Upon receipt of the application and fees, the Department of Fish and Wildlife ("Department") shall issue the permit for use of the permitted vessel in the subsequent permit year only to the owner of the permitted vessel.

Authority-Late Renewal Applications
FGC Section 7852.2(a) establishes a graduated late fee for any renewal application that is received after the deadline.

FGC Section 7852.2(b) states the Department shall not waive the applicable late fee. Additionally, FGC Section 7852.2(c) requires the Department to deny any application for renewal received after March 31 of the permit year following the year in which the applicant last held a valid permit for that fishery.

Reason for Appeal to the Department
In your letter received on July 27, 2020, you explained that your Commercial Boat Registration, Commercial Fishing License, and Commercial Fishing Salmon Stamp were all renewed but your SVP was not due to a mistake. You stated that it was an honest mistake and that you need the permit to make a living. You further explained that you have been fishing for 11 years and have not had a single violation.

Department Findings
Department license records show that the F/V *Julie Ann* last held a valid SVP in 2018-2019, which made you eligible to renew the permit for the 2019-2020 permit year.

Department Determination
Your request to reinstate the SVP for the F/V *Julie Ann* is denied because the F/V *Julie Ann* last held a valid SVP in the 2018-2019 permit year. The Department received your request for reinstatement of the SVP on July 27, 2020. FGC Section 7852.2(c) requires the Department to deny any application for renewal received after March 31 of the permit year following the year in which the applicant last held a valid permit for that fishery.

Deadline to File an Appeal to the Fish and Game Commission
If you wish to appeal the Department's decision, you must submit a written appeal to the Fish and Game Commission (Commission) either by mail at P.O. Box 944209, Sacramento, CA 94244-2090, or by email at fgc@fgc.ca.gov. Pursuant to FGC Section 7852.2(d), your written appeal must be received within 60 days of the date of this letter. The Commission, upon consideration of the appeal, may grant the renewal of the SVP. If the Commission grants the renewal, it shall assess the applicable late fees, which amount to $1,985.35. A fee schedule is enclosed.

If you have any questions or require further assistance, please contact Ms. Ruth Flores at (916) 928-7470 or Ruth.Flores@wildlife.ca.gov.

Sincerely,

Joshua Morgan, Chief
License and Revenue Branch

cc: Ms. Melissa Miller-Henson
Fish and Game Commission
Sacramento, CA

Ms. Ruth Flores
California Department of Fish and Wildlife
Sacramento, CA

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Mr. Nicholas B. Perrone
Fees Required for Reinstatement for a
Salmon Vessel Permit (SVP)
Permit Number SA0053
F/V *Julie Ann* (FG00850)

Prior Year Fees		**Permit Fees**
2019-2020 SVP		$ 45.84
	Late Fee (61 days to March 31, 2020)	$ 627.50
Prior Year Fees Due		**$ 673.34**
Current Year Fees		
2020-2021	Commercial Fishing License	$ 149.09
	Commercial Fishing Salmon Stamp	$ 87.55
	Commercial Boat Registration	$ 387.25
	SVP	$ 46.87
	Late Fee (61 days to March 31, 2021)	$ 641.25
Total Current Fees Due		**$ 1,312.01**
Total Fees Due		**$ 1,985.35**

If the Fish and Game Commission should recommend approval, full payment of $1,985.35 would be due.

RECEIVED
CALIFORNIA
FISH AND GAME
COMMISSION
2020 AUG 25 AM 7:57

To the fish and game commission:

This letter is my appeal to fish and game commission.

I did not know that my SVP salmon vessel permit did not get payed when I renewed the registration, commercial fishing license and salmon stamp.

This has been very stressful for me and my family. I need my permit to make a living. I have never had any violations with fish and game or the coast guard. This was a honest mistake not neglect please grant renewal of my SVP I am begging you. My boat was built specifically for salmon and the permit has been with the boat for a very long time

I have attached the letter I sent Ruth Flores and that she has sent back

Caption/owner Nicholas Perrone

Contact number [redacted]

Mailing address [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

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

October 2, 2020

California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090
FGC@FGC.Ca.Gov

Re: *In the Matter of Nicholas Perrone*; Agency Case No. 20ALJ08-FGC

Dear Commissioners:

This letter is in response to Nicholas Perrone's request to appeal the Department of Fish and Wildlife's ("Department") denial of his request to renew his Salmon Vessel Permit, #SA0053 ("SVP"). The SVP was last valid during the 2018-19 fishing year. The Fish and Game Commission ("Commission") received his appeal request on August 25, 2020. The Department will not be participating in this appeal and accordingly, does not object to the renewal of the SVP for the 2020-2021 fishing year, provided that he pays all applicable fees.

The fees that Mr. Perrone must pay to renew the SVP are described in Fish and Game Code, section 7852.2 ("Section 7852.2"), subdivision (a). Section 7852.2, subdivision (a) states:

> (a) In addition to the base fee for the license, stamp, permit, or other entitlement, the department shall assess a late fee for any renewal the application for which is received after the deadline, according to the following schedule:
> (1) One to 30 days after the deadline, a fee of one hundred twenty-five dollars ($125).
> (2) Thirty-one to 60 days after the deadline, a fee of two hundred fifty dollars ($250).
> (3) Sixty-one days or more after the deadline, a fee of five hundred dollars ($500).

To emphasize that these fees must be paid, Section 7852.2, subdivision (b) states that "The department shall not waive the applicable late fee," while subdivision (d) states "If the commission grants renewal, it shall assess the applicable late fee pursuant to subdivision (a)." The fees total $**1,985.35** (see attached fee schedule).

If you have any questions please contact me at the address above or by e-mail at David.Kiene@Wildlife.Ca.Gov.

Sincerely,

DocuSigned by:
David Kiene
0254C8A9A1D45E...
DAVID KIENE
Senior Staff Counsel

Cc: Nicholas Perrone

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Mr. Nicholas B. Perrone
Fees Required for Reinstatement for a
Salmon Vessel Permit (SVP)
Permit Number SA0053
F/V *Julie Ann* (FG00850)

Prior Year Fees	**Permit Fees**
2019-2020 SVP	$ 45.84
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Commercial Fishing Salmon Stamp	$ 87.55
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