

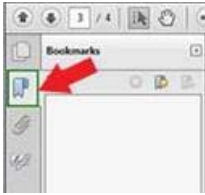
California Fish and Game Commission
Marine Resources Committee
Meeting Binder



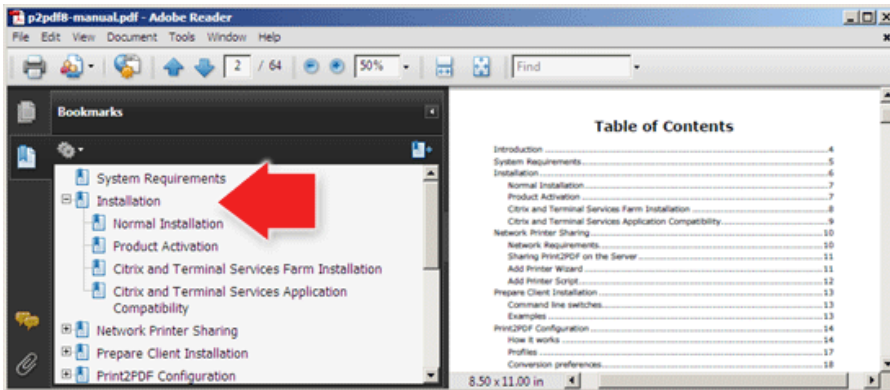
March 20, 2019
Sacramento

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 COMMITTEE MEETING

- Welcome to this meeting of the _____ Committee. The Committee is comprised of up to two Commissioners who co-chair each meeting; members are assigned by the Commission annually.
- Our goal today is informed discussion to guide future decision making, and, we need your cooperation to ensure a lively and comprehensive dialogue.
- We are operating under Bagley-Keene Open Meeting Act, but it is important to note that the Committee chairs cannot take action independent of the full Commission; instead, the chairs make recommendations to the full Commission at regularly scheduled meetings.
- These proceedings may be recorded and posted to our website for reference and archival purposes.
- Items may be heard in any order pursuant to the determination of the Committee Co-Chairs.
- In the unlikely event of an emergency, please locate the nearest emergency exits.
- Restrooms are located _____.
- As a general rule, requests for regulatory change need to be redirected to the full Commission and submitted on the required petition form, FGC 1, titled “Petition to the California Fish and Game Commission for Regulation Change” (Section 662, Title 14, CCR). However, at the Committee’s discretion, the Committee may request that staff follow up on items of potential interest to the Committee and possible recommendation to the Commission.
- Committee meetings operate informally and provide opportunity for everyone to provide comment on agenda items. If you wish to speak on an agenda item, please follow these guidelines:
 1. Raise your hand and wait to be recognized by the Committee.
 2. Provide your name, affiliation (if any), and the number of people you represent.
 3. Time is limited; please keep your comments precise to give others time to speak.
 4. If several speakers have the same concerns, please appoint a group spokesperson.
 5. If you would like to present handouts or written materials to the Committee, please provide five copies to the designated staff member just prior to speaking.
 6. If speaking during public comment, the subject matter you present should not be related to any item on the current agenda (public comment on agenda items will be taken at the time the Committee members discuss that item).
- **Warning!** Laser pointers may only be used by a speaker doing a presentation.

INTRODUCTIONS FOR FISH AND GAME COMMISSION MARINE RESOURCES COMMITTEE

FISH AND GAME COMMISSIONERS

Eric Sklar	Co-Chair (Saint Helena)
Peter Silva	Co-Chair (Jamul)

COMMISSION STAFF

Susan Ashcraft	Acting Deputy Executive Director
Elizabeth Pope	Acting Marine Advisor
Sergey Kinchak	Staff Services Analyst
Leslie Hart	California Sea Grant Fellow
Maggie McCann	California Sea Grant Fellow

DEPARTMENT OF FISH AND WILDLIFE

Craig Shuman	Regional Manager, Marine Region
Randy Lovell	Statewide Aquaculture Coordinator
Bob Puccinelli	Captain, Law Enforcement Division
Sonke Mastrup	Environmental Program Manager

I would also like to acknowledge special guests who are present:
(i.e., key DFW staff, elected officials, tribal chairpersons, other special guests)

Commissioners
Eric Sklar, President
Saint Helena
Jacque Hostler-Carmesin, Vice President
McKinleyville
Russell E. Burns, Member
Napa
Peter S. Silva, Member
Jamul
Vacant, Member

STATE OF CALIFORNIA
Gavin Newsom, Governor

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

Fish and Game Commission



Wildlife Heritage and Conservation
Since 1870

MARINE RESOURCES COMMITTEE

Committee Co-chairs: Commissioner Sklar and Commissioner Silva

Meeting Agenda
March 20, 2019, 9:00 a.m.

Natural Resources Building
Redwood Room, 14th Floor
1416 Ninth Street, Sacramento, CA 95814

This meeting may be audio-recorded.

NOTE: Please see important meeting procedures and information at the end of the agenda. Unless otherwise indicated, the California Department of Fish and Wildlife is identified as Department. All agenda items are informational and/or discussion only. The Committee develops recommendations to the Commission but does not have authority to make policy or regulatory decisions on behalf of the Commission.

Call to order

1. Approve agenda and order of items

2. General public comment for items not on the agenda

The Committee may not discuss or take action on any matter raised during this item, except to consider whether to recommend that the matter be added to the agenda of a future meeting. [Sections 11125, 11125.7(a), Government Code]

3. Staff and agency updates

Receive updates from staff and other agencies on items of note since the last Committee meeting.

(A) California Ocean Protection Council

(B) Department

I. Marine Region, including update on stakeholder engagement

II. Law Enforcement Division, including update on compliance with red abalone recreational fishery closure

(C) Commission staff update

4. **Pacific Herring Fishery Management Plan (FMP)**
Receive Department update on Pacific herring fishery and draft FMP.
5. **Red Abalone FMP**
Receive Department update on collaborative progress in completing the Red Abalone FMP.
6. **Marine Life Management Act (MLMA) Master Plan implementation**
Receive Department update on implementing the 2018 Master Plan for Fisheries.
7. **Coastal fishing communities project**
Receive staff update on coastal fishing communities project, staff report progress, and discuss next steps.
8. **Offshore marine aquaculture programmatic environmental impact report (PEIR)**
Receive Department update on developing a PEIR that will evaluate a proposed regulatory framework governing future offshore marine aquaculture in California.
9. **Shellfish aquaculture best management practices (BMPs)**
Receive Department update on developing a proposed regulation to require BMP plans for state water bottom leases issued by the Commission for purposes of aquaculture.
10. **Commercial trap fishing gear informational item**
Receive informational presentations from Department and members of the California Dungeness Crab Fishing Gear Working Group related to development of innovative gear design and other whale entanglement avoidance measures or experiments.
11. **Future agenda items**
 - (A) Review work plan agenda topics and timeline
 - (B) Potential new agenda topics for Commission consideration

Adjourn

**California Fish and Game Commission
2019 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	Other Meetings
April 17	City of Santa Monica Civic East Wing 1855 Main Street Santa Monica, CA 90403		
May 16		Wildlife Resources Natural Resources Building Redwood Room, 14 th Floor 1416 Ninth Street Sacramento, CA 95814	
May 16	Teleconference – Arcata, Fairfield, Sacramento and San Diego		
June 11		Tribal Redding	
June 12-13	Redding		
July 11		Marine Resources California Department of Parks and Recreation Orange Coast District Office Training Room 3030 Avenida del Presidente San Clemente, CA 92672	
August 7-8	Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814		
September 5		Wildlife Resources Justice Joseph A. Rattigan State Building 50 D Street Conf. Rm 410 (4th Fl.) Santa Rosa, CA 95404	
October 8		Tribal San Diego	
October 9-10	San Diego		
November 5		Marine Resources 12 th Floor Conference Room 1416 Ninth Street, Room 1206 Sacramento, CA 95814	
December 11- 12	Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814		

OTHER 2019 MEETINGS OF INTEREST

Association of Fish and Wildlife Agencies

- September 22-25, Saint Paul, MN

Pacific Fishery Management Council

- April 9-16, Rohnert Park, CA
- June 18-25, San Diego, CA
- September 11-18, Boise, ID
- November 13-20, Costa Mesa, CA

Pacific Flyway Council

- August 23, TBD

Western Association of Fish and Wildlife Agencies

- July 11-16, Manhattan, KS

Wildlife Conservation Board

- May 22, Sacramento, CA
- August 28, Sacramento, CA
- November 21, Sacramento, CA

IMPORTANT COMMITTEE MEETING PROCEDURES INFORMATION

Welcome to a meeting of the California Fish and Game Commission's Marine Resources Committee. The Committee is chaired by up to two Commissioners; these assignments are made by the Commission.

The goal of the Committee is to allow greater time to investigate issues before the Commission than would otherwise be possible. Committee meetings are less formal in nature and provide for additional access to the Commission. The Committee follows the noticing requirements of the Bagley-Keene Open Meeting Act. It is important to note that the Committee chairs cannot take action independent of the full Commission; instead, the chairs make recommendations to the full Commission at regularly scheduled meetings.

The Commission's goal is the preservation of our heritage and conservation of our natural resources through informed decision making; Committee meetings are vital in developing recommendations to help the Commission achieve that goal. In that spirit, we provide the following information to be as effective and efficient toward that end. Welcome, and please let us know if you have any questions.

PERSONS WITH DISABILITIES

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

SUBMITTING WRITTEN MATERIALS

The public is encouraged to attend Committee meetings and engage in the discussion about items on the agenda; the public is also welcome to comment on agenda items in writing. You may submit your written comments by one of the following methods (only one is necessary): **Email** to fgc@fgc.ca.gov; **mail** to California Fish and Game Commission, P.O. Box 944209, Sacramento, CA 94244-2090; **deliver** to California Fish and Game Commission, 1416 Ninth Street, Room 1320, Sacramento, CA 95814; or **hand-deliver to a Committee meeting**.

COMMENT DEADLINES

The **Written Comment Deadline** for this meeting is **5:00 p.m. on March 7, 2019**. Written comments received at the Commission office by this deadline will be made available to Commissioners prior to the meeting.

The **Late Comment Deadline** for this meeting is **noon on March 15, 2019**. Comments received by this deadline will be marked "late" and made available to Commissioners at the meeting.

After these deadlines, written comments may be delivered in person to the meeting – please bring five (5) copies of written comments to the meeting.

The Committee **will not** consider comments regarding proposed changes to regulations

that have been noticed by the Commission. If you wish to provide comment on a noticed item, please provide your comments during Commission business meetings, via email, or deliver to the commission office.

Note: Materials provided to the Committee may be made available to the general public.

REGULATION CHANGE PETITIONS

As a general rule, requests for regulatory change need to be redirected to the full Commission and submitted on the required petition form, FGC 1, titled "Petition to the California Fish and Game Commission for Regulation Change" (Section 662, Title 14, CCR). However, at the Committee's discretion, the Committee may request that staff follow up on items of potential interest to the Committee and possible recommendation to the Commission.

SPEAKING AT THE MEETING

Committee meetings operate informally and provide opportunity for everyone to comment on agenda items. If you wish to speak on an agenda item, please follow these guidelines:

1. Raise your hand and wait to be recognized by the Committee chair or co-chair(s).
2. Once recognized, please begin by giving your name and affiliation (if any) and the number of people you represent.
3. Time is limited; please keep your comments concise so that everyone has an opportunity to speak.
4. If there are several speakers with the same concerns, please try to appoint a spokesperson and avoid repetitive comments.
5. If you would like to present handouts or written materials to the Committee, please provide five copies to the designated staff member just prior to speaking.
6. If speaking during public forum, the subject matter you present should not be related to any item on the current agenda (public comment on agenda items will be taken at the time the Committee members discuss that item). As a general rule, public forum is an opportunity to bring matters to the attention of the Committee, but you may also do so via email or standard mail. At the discretion of the Committee, staff may be requested to follow up on the subject you raise.

VISUAL PRESENTATIONS/MATERIALS

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

1. Electronic presentations must be provided by email by the written materials deadline.
2. All electronic formats must be Windows PC compatible.
3. It is recommended that a print copy of any electronic presentation be submitted in case of technical difficulties.
4. A data projector, laptop and presentation mouse will be available for use at the meeting.

LASER POINTERS may only be used by a speaker during a presentation.

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

2. PUBLIC FORUM**Today's Item****Information** **Direction**

Receive public comments for items not on the agenda.

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

The Committee generally receives two types of correspondence or comment under public forum: Requests for MRC to consider new topics, and informational items. As a general rule, requests for regulatory change need to be directed to FGC and submitted on the required petition form, FGC 1, *Petition to the California Fish and Game Commission for Regulation Change* (Section 662, Title 14, CCR). However, at the discretion of the Committee, staff may be requested to follow up on items of potential interest to the Committee and possible recommendation to FGC.

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

If the Committee wants to recommend any new future agenda items based on issues raised and within FGC's authority, staff recommends holding for discussion under today's Agenda Item 11, *Future Committee agenda topics*.

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

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

3. STAFF AND AGENCY UPDATES**Today's Item****Information** **Direction**

Receive updates from staff and other agencies, including the California Ocean Protection Council (OPC) and DFW.

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

This is a standing item for DFW and other government agencies to provide an update on marine-related activities of interest.

- (A) **OPC:** An OPC representative will provide an update.
- (B) **DFW:** Updates will include two topics requested by MRC at its Nov 2018 meeting.
 - I. *Marine Region:* Regional Manager Craig Shuman will provide an update on stakeholder engagement, including lessons learned from past efforts and current tools. The Marine Region also completed a 2018 year-in-review report (Exhibit 1).
 - II. *Law Enforcement Division:* Captain Bob Puccinelli will provide an update on compliance with the red abalone recreational fishery closure.
- (C) **FGC staff:** Following the Feb FGC meeting, Marine Advisor Susan Ashcraft assumed the role of acting deputy executive director, leaving the need for an acting marine advisor; Environmental Scientist Elizabeth Pope was selected from among several interested DFW staff to serve as acting marine advisor as of Feb 18.

Today will be the final MRC meeting for Sea Grant State Fellow Leslie Hart; her year-long fellowship ends next week and she will be sorely missed. A new fellow for the upcoming year, Maggie McCann, joined the team last week.

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

1. DFW's *Marine Region 2018 Year in Review*, dated Mar 7, 2019

Committee Direction/Recommendation (N/A)

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

4. PACIFIC HERRING FISHERY MANAGEMENT PLAN**Today's Item****Information** **Direction**

Receive DFW update on Pacific herring fishery and draft fishery management plan (FMP).

Summary of Previous/Future Actions

- | | |
|--|--------------------------------------|
| • DFW updates to MRC on FMP progress | 2016-2017; MRC meetings |
| • DFW update and MRC recommendation | Jul 17, 2018; MRC, San Clemente |
| • FGC request for update on commercial fishery | Feb 6, 2019; Sacramento |
| • Today's update | Mar 20, 2019; MRC, Sacramento |
| • FGC receipt of draft FMP | Jun 12-13, 2019; FGC, Redding |
| • FGC discussion of draft FMP | Aug 7-8, 2019; FGC, Sacramento |
| • Potentially adopt FMP | Oct 9-10, 2019; FGC, San Diego |

Background

A collaborative FMP for Pacific herring has been under development since 2016 with regular MRC discussions, input, and recommendations (for additional background on FMP development, see staff summary from Jul 2018 MRC meeting, Exhibit 1). Based on the Jul 2018 discussion, MRC recommended and FGC approved in Aug 2018 endorsing DFW's recommendations for the Pacific herring FMP and implementing regulations and timeline, included guidance on a proposed recreational take limit range, and scheduled receipt of the draft FMP for Oct 2018, following peer review.

In Dec 2018, DFW notified FGC that a change in the rulemaking timetable was necessary to allow DFW time to address specific recommendations from the peer review. In Feb 2019, DFW requested that receipt of the draft FMP and potential notice of implementing regulations be rescheduled for Jun 2019. In granting the request, FGC requested that an update, including the status of the current commercial Pacific herring fishery, be provided at the Mar 2019 MRC meeting.

Today, DFW contractor Sara Valencia will provide an update on the current commercial Pacific herring fishery, as well as an update on changes incorporated into the draft FMP based on peer review recommendations to add additional ecosystem indicators into the management strategy evaluation of the FMP.

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

1. Staff summary, Jul 17, 2018 MRC meeting (for background purposes)

Committee Direction/Recommendation (N/A)

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

5. RED ABALONE FISHERY MANAGEMENT PLAN (FMP)**Today's Item****Information** **Action**

Receive DFW update on collaborative progress to complete the red abalone FMP.

Summary of Previous/Future Actions

- FGC supported red abalone FMP development per MRC recommendation Oct 8, 2014; Mt. Shasta
- DFW updates to MRC on FMP process 2015-2017; MRC meetings
- FGC received update on FMP process Dec 6-7, 2017; San Diego
- FGC discussions of FMP scope and content 2018; various
- Received peer review results for draft FMP and re-referred to MRC Oct 17, 2018; Fresno
- MRC discussion of revised FMP process Nov 14, 2018; MRC, Sacramento
- **Today's update** **Mar 20, 2019; MRC, Sacramento**

Background

A red abalone FMP has been under development by DFW since 2014, with regular updates to MRC and FGC. DFW staff has also reported unprecedented environmental conditions on California's north coast with significant biological impacts to abalone, and how those impacts are affecting the FMP process and its possible provisions.

Last year, two sets of proposed harvest control rules (HCRs) for the FMP—one proposed by DFW, and an alternate proposed by The Nature Conservancy (TNC) using stakeholder-developed metrics—went through independent scientific peer review with FGC's support. Peer review results (available online at http://www.oceansciencetrust.org/wp-content/uploads/2018/10/AbalonePeerReview_Final_Oct2018.pdf) presented to FGC in Oct 2018 recommended possible integration of aspects from each HCR, to be more robust against uncertainty under different fishery conditions. FGC referred the item back to MRC to explore possible pathways for considering HCR integration. For a more detailed background on the process to date, see exhibits 1 and 2.

At the Nov 2018 MRC meeting, DFW presented a draft approach for responding to peer review recommendations and revising the draft FMP. Based on discussion, MRC recommended that FGC: (1) support addressing peer review recommendations to integrate aspects of both draft management strategies based on a modeling approach developed by DFW, engaging abalone divers and other stakeholders in the process; (2) revise FMP goals to allow for a *de minimis* fishery option; (3) develop triggers for the *de minimis* fishery option in consultation with stakeholders; and (4) request that DFW develop a proposed process and timeline which accounts for active public and MRC engagement. FGC approved the recommendations in Dec 2018.

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

Today, MRC will receive an update from DFW and TNC staff on developing a collaborative team structure to support management strategy integration and opportunities for public engagement. Staff will highlight next steps.

Significant Public Comments

1. A recreational abalone fisherman expressed his appreciation for FGC and DFW leadership efforts in the red abalone FMP, specifically the peer review and integration of both the DFW and TNC proposals, and the allowance for a *de minimis* fishery, which could serve to act as a blueprint for other fisheries (Exhibit 3).

Recommendation (N/A)**Exhibits**

1. Staff summary for FGC Agenda Item 11, Oct 17, 2018 (for background purposes only)
2. Staff summary for MRC Agenda Item 5, Nov 14, 2018 (for background purposes only)
3. Email from Jack Likins, received Mar 6, 2019

Committee Direction/Recommendation (N/A)

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

6. MARINE LIFE MANAGEMENT ACT MASTER PLAN IMPLEMENTATION**Today's Item****Information** **Direction**

Receive DFW update on next steps for implementing the 2018 master plan for fisheries.

Summary of Previous/Future Actions

- | | |
|--|--------------------------------------|
| • FGC adopted 2018 master plan for fisheries | Jun 20-21, 2018; Sacramento |
| • Last update on master plan implementation | Nov 14, 2018; MRC, San Clemente |
| • Today's update on implementation | Mar 20, 2019; MRC, Sacramento |

Background

The Marine Life Management Act (MLMA) of 1998 directed DFW to submit to FGC for approval a master plan that specifies the process and resources needed to prepare, adopt, and implement fishery management plans (FMPs) for sport and commercial marine fisheries managed by the State, with input from fisheries participants, marine conservationists, scientists, and other interested parties (Fish and Game Code Section 7073). Pursuant to the MLMA requirement, in 2001 FGC adopted *The Master Plan: A Guide for the Development of Fishery Management Plans*, developed by DFW with stakeholder input.

After over 15 years of MLMA implementation founded on master plan guidance, and a three-year DFW effort to review the plan and new implementation tools, FGC adopted an updated plan, *2018 Master Plan for Fisheries: A Guide for Implementation of the Marine Life Management Act* (2018 Master Plan) in Jun 2018.

Recognizing the importance of 2018 Master Plan implementation planning and transparency, in Jun 2018 FGC referred the topic to MRC and requested it become a standing agenda item to receive regular DFW updates and to discuss implementation steps, priorities, and opportunities associated with the 2018 Master Plan.

Today is the third discussion of 2018 Master Plan implementation efforts since its adoption. DFW staff has completed a draft implementation work plan (Exhibit 1) and will provide an overview at the meeting.

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

1. *DRAFT Marine Life Management Act Master Plan: Implementation Work Plan*, dated Mar 12, 2019

Committee Direction/Recommendation (N/A)

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

7. COASTAL FISHING COMMUNITIES PROJECT**Today's Item**Information Direction

Receive staff update on coastal fishing communities project, receive update on staff report revisions progress, and discuss next steps.

Summary of Previous/Future Actions

- | | |
|--|--------------------------------------|
| • FGC refers topic to MRC | Feb 11, 2015; Sacramento |
| • MRC discussions, planning, and public meetings | 2015 - 2017; various |
| • MRC received and discussed staff report | Jul 17, 2018; MRC, San Clemente |
| • Most recent MRC update | Nov 14, 2018; MRC, Sacramento |
| • Today's update and next steps | Mar 20, 2019; MRC, Sacramento |

Background

An MRC project under FGC direction, the Coastal Fishing Communities Project has been underway since 2015 (see Exhibit 1 for background). At the direction of MRC, staff held a series of eight stakeholder conversations (2016-2018) in coastal communities across the state, which were designed to inform MRC on the issues facing fishing communities.

In Jul 2018, FGC staff completed a report intended to capture and summarize information provided during the coastal communities meetings, and to identify common themes and port-specific challenges (Exhibit 2). Staff provided the report and an overview presentation at the Jul 2018 MRC meeting, where MRC directed staff to open the report for public comment. Following a six-week public comment period, staff summarized 14 comment letters with over 75 unique comments.

At the Nov 2018 MRC meeting, stakeholders requested that the staff report be revised to integrate the public comments, and add more detailed information and an analysis of options, which could provide greater context before MRC recommends any specific actions to move forward. MRC recommended, and in Dec FGC approved, that staff engage further with interested stakeholders to integrate the input from public comments into a more in-depth report, including analyses of options and potential partnerships, and to report back to MRC in Mar 2019 (see Exhibit 3 for background).

Following the last MRC meeting, staff began working on a revised staff report and has held numerous discussions with stakeholders and partners to determine existing, related efforts and potential collaborations. However, while staff has made progress toward meeting MRC and FGC direction, a revised staff report has not been completed due to multiple staff limitations and redirection of staff time toward completing a new legislative mandate. Today, staff will report on progress made in four staff-identified focal areas: staff report revision, public outreach, partner efforts, and collaborations.

Significant Public Comments (N/A)

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

Recommendation

Discuss progress and challenges, solicit feedback, and provide input on where to focus staff efforts.

Exhibits

1. Staff summary from Nov 4, 2015 MRC meeting (for background purposes only)
2. Staff synthesis report on 2017-2018 California coastal community meetings, Jul 2018
3. Staff summary from Nov 14, 2018 MRC meeting (for background purposes only)

Committee Direction/Recommendation (N/A)

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

8. OFFSHORE MARINE AQUACULTURE**Today's Item****Information** **Direction**

Receive DFW update on developing a programmatic environmental impact report (PEIR) that will evaluate a proposed regulatory framework governing future offshore marine aquaculture in California.

Summary of Previous/Future Actions

- | | |
|------------------------------|--------------------------------------|
| • FGC referral to MRC | Apr 18-19, 2018; Ventura |
| • PEIR overview | Nov 14, 2018; MRC, Sacramento |
| • Today's PEIR update | Mar 20, 2019; MRC, Sacramento |

Background

FGC has authority to lease state water bottoms for purposes of conducting aquaculture in marine waters of the State (sections 15400 and 15405, Fish and Game Code). While shellfish aquaculture and seaweed culture are currently conducted on 17 active leases across the state, no commercial offshore marine finfish aquaculture shall be authorized by FGC in California until a programmatic environmental impact report (PEIR) evaluates a framework for potential future offshore marine aquaculture (for background see Exhibit 1).

A draft PEIR is anticipated to be released for public comment in spring 2019, with preparation of a final PEIR and submission to FGC for possible certification to follow. Today, DFW project lead Randy Lovell will provide an update on the status and timing of the offshore marine aquaculture PEIR as well as opportunities for public involvement once the draft is completed.

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

1. Staff summary from Agenda Item 7, Nov 14, 2018 MRC (for background purposes)

Committee Direction/Recommendation (N/A)

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

9. SHELLFISH AQUACULTURE BEST MANAGEMENT PRACTICES**Today's Item****Information** **Direction**

Receive DFW update on progress developing a proposed regulation to require best management practices (BMPs) plans for state water bottom leases issued by FGC for purposes of aquaculture.

Summary of Previous/Future Actions

- | | |
|---|--------------------------------------|
| • FGC discussed possible BMPs | Feb 10-11, 2016; Sacramento |
| • FGC supported BMPs rulemaking approach | Jun 22-23, 2016; Bakersfield |
| • MRC discussed aquaculture debris | Jul 21, 2016; MRC, Petaluma |
| • MRC update on BMPs development | Jul 20, 2017; MRC, Santa Rosa |
| • MRC update on management activities | Mar 6, 2018; MRC, Santa Rosa |
| • Draft BMP categories presented to MRC | Jul 17, 2018; MRC, San Clemente |
| • Draft BMP requirements presented to MRC | Nov 14, 2018; MRC, Sacramento |
| • Today's update | Mar 20, 2019; MRC, Sacramento |

Background

With the exception of Humboldt and San Diego bays, FGC has the authority to lease state water bottoms to any person for the purpose of conducting aquaculture in marine waters of the State, under terms agreed upon between FGC and the lessee (sections 15400 and 15405, California Fish and Game Code).

In 2016, FGC approved a staff recommendation to enhance lease stewardship through a regulation that specifies objectives that must be addressed by each lease holder in lease-specific shellfish aquaculture BMPs plans, and referred the topic to MRC (see Exhibit 1 for background).

Actions to date have included:

- Regular discussions at MRC meetings;
- MRC and FGC support of draft BMP categories developed by staff based on input at regional public meetings, and direction to develop proposed requirements (Exhibit 2);
- Draft proposed requirements for BMP categories developed by DFW and FGC staff (Exhibit 2), and public feedback on the draft proposed requirements gained through an Oct 2018 public meeting in Santa Rosa and written comments (Exhibit 3);
- MRC recommendation in Nov 2018, and FGC approval in Dec 2018, for staff to “revise the draft proposed requirements based on the public comments received; provide an opportunity for public review of the revised draft proposed requirements; and schedule the topic for MRC review and possible recommendation in Mar 2019.

Following the last MRC meeting, staff began refining the draft BMP proposal; however, completing a revised draft proposal has been delayed due to multiple staff limitations and

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

redirection of staff time toward completing a new legislative mandate. In particular, FGC staff medical leave and acting assignments created gaps, and both FGC and DFW staff have been re-directed to complete a legislatively-mandated, service-based budgeting process. The budgeting exercise includes documenting staffing and capacity needs for every service provided by DFW and FGC throughout the entire state, including aquaculture (over 3,500 service items have been identified). Following documentation of aquaculture services and associated staff time to provide those services, DFW and FGC leadership will meet to discuss strategies for completing the BMP project.

Today, DFW project lead Randy Lovell will provide any further updates.

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

Temporarily place development of the BMPs plans regulation on hold and reassess the development timeline during the Jul 2019 MRC meeting.

Exhibits

1. Staff summaries from Jul 20, 2017 and Jul 17, 2018 MRC meetings (for background purposes)
2. *Proposed Requirements for Shellfish Aquaculture Lease Best Management Practices (BMP) Plans Regulation*, dated Oct 24, 2018
3. Staff summary from Nov 14, 2018 MRC meeting (for background purposes)

Committee Direction/Recommendation

MRC recommends that the timeline for developing an aquaculture BMPs plans regulation be reassessed at the Jul 2019 MRC meeting.

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

10. COMMERCIAL TRAP FISHING GEAR INFORMATIONAL ITEM**Today's Item****Information** **Direction**

Receive informational presentations from DFW and members of the California Dungeness Crab Fishing Gear Working Group related to developing innovative gear design and other whale entanglement avoidance measures or experiments.

Summary of Previous/Future Actions

- Approve stakeholder request for MRC topic Feb 6, 2019; Sacramento
- **Today's presentations** **Mar 20, 2019; MRC, Sacramento**

Background

Regulated by DFW and the California State Legislature, and not FGC, the commercial Dungeness crab fishery operates by using round baited traps covered with netting, which are then set in deeper water and tied to floating buoys. In recent years, as whale populations in California waters have increased, leading to a greater presence in fishing grounds, the risk of interaction with and entanglement in deployed fishing gear has increased.

DFW, in partnership with the National Marine Fisheries Service (NMFS) and California Ocean Protection Council (OPC), convened the Dungeness Crab Fishing Gear Working Group in 2015 to “tackle the challenge of reducing the risk of whale entanglements in the California Dungeness crab fishery” (Exhibit 1). While the Dungeness crab fishery is not the only trap fishery in State waters, the findings of the working group may help to inform other trap-based fisheries and to reduce risks of marine life entanglements through development of gear innovations.

In Feb 2019, FGC approved an MRC agenda request from Geoff Shester, a working group member, to inform MRC of ropeless trap gear innovation efforts. In addition, DFW offered to provide a general update on progress made by the working group related to developing trap fishing gear innovations intended to help reduce the risk of entanglement (see Exhibit 2 for an example). Geoff and DFW will present informational overviews today.

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

1. California Dungeness Crab Fishing Gear Working Group fact sheet, dated Oct 2017
2. *Guidelines for Research and Development Projects: Focus on Ropeless Gear Innovations*, California Dungeness Crab Fishing Gear Working Group, dated Feb 2019

Committee Direction/Recommendation (N/A)

COMMITTEE STAFF SUMMARY FOR MARCH 20, 2019

11. FUTURE AGENDA ITEMS**Today's Item**Information Direction

Review upcoming agenda items scheduled for the next and future MRC meetings, hear requests from DFW and interested stakeholders for future agenda items, and identify new items for consideration.

Summary of Previous/Future Actions

- FGC approved MRC agenda and work plan Feb 6, 2019; Sacramento
- **Today's discussion** **Mar 20, 2019; MRC, Sacramento**
- Next meeting Jul 11, 2019; MRC, San Clemente

Background

Committee topics are referred by FGC and scheduled as appropriate. FGC-referred topics and their current schedule are shown in the MRC work plan, Exhibit 1. MRC agendas currently include several complex and time-intensive topics under development. The committee has placed emphasis on issues of imminent regulatory or management importance, and thus considering new topics will require planning relative to existing committee workload.

MRC Work Plan and Timeline

Draft agenda topics identified for the Jul 2019 MRC meeting:

1. Agency updates
2. Update on MLMA master plan for fisheries implementation
3. Update on red abalone fishery management plan development
4. Update and discussion on best management practices plan requirements for aquaculture leases
5. Update, discussion and potential recommendation on aquaculture programmatic environmental impact report
6. Discussion of potential changes to commercial kelp and algae harvest regulations
7. Update and discussion on California coastal fishing communities project

Discuss and Recommend New MRC Topics

Today provides an opportunity to identify any potential new agenda topics to recommend to FGC for referral to MRC.

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

FGC staff: No new topics are recommended for FGC referral to MRC.

Exhibits

1. MRC work plan, dated Feb 11, 2019
2. FGC perpetual timetable for regulatory actions, dated Feb 13, 2019

Committee Direction/Recommendation (N/A)



MARINE REGION

2018 YEAR IN REVIEW

Message from the Regional Manager

We are fortunate to live in an era where we have massive amounts of data at our fingertips. With a few clicks of the mouse, we can pull up almost any fact from recorded or geologic history. When I come across something extraordinary, I often find it comforting to look back across the historical record to see that this is not the first time that society or, in some cases, the planet has experienced that event.

It is with this in mind that I find the numerous climatic records broken in 2018 troubling. Many of you may recall that it was really hot throughout much of California last summer. The Van Nuys airport broke the all-time record at a blistering 117° F on July 6, 2018, with downtown Los Angeles and UCLA recording 108° F and 111° F, respectively. This was part of a global heat event that saw what is possibly an all-time high for Africa of 124° F and numerous [heat records around the globe](#). These heat records correlate with the global trend of rising carbon dioxide. As measured in ice cores, over the past 400,000 years [global carbon dioxide levels never rose above 300 parts per million](#). The planet reached that level in 1950 and is [currently over 400 parts per million](#). These records are consistent with the unprecedented rates of change in our climate that are manifested in more pronounced periods of drought, heat waves, floods, and fire. Fire “season” in California continues to grow longer and more widespread. Tragically, 2018 saw both the [largest](#) (Mendocino Complex fire in July) and [deadliest](#) (Camp Fire in November) wildfires in California history.

The ocean is also experiencing a wave of new records. 2017 was proclaimed the warmest year on record for the global ocean in a [peer-reviewed article](#) published in the journal *Advances in Atmospheric Sciences* and on August 1, sea surface temperature at the [Scripps Pier hit 78.6° F](#), the warmest sea surface temperature recorded there since measurements began in 1916. [Arctic sea ice](#) and [ice sheets](#) are continuing to decrease and sea level continues its rising trend.

While many of us enjoyed basking in the warm ocean waters this past summer, and some took advantage of the great fishing opportunities, I can't help but wonder what price we might pay for these record-setting conditions.

Will periodic closures of our iconic Dungeness crab and lobster fisheries due to harmful algal blooms become the norm rather than the exception? Are the warm waters in Southern California related to the conditions in Central and Northern California that have led to widespread loss of kelp, urchin barrens and the closure of our beloved recreational abalone fishery?

The [Fourth National Climate Assessment](#) released in late November 2018 found that coastal communities and the ecosystems that support them are increasingly threatened by the impacts of climate change. We must be prepared to manage the impacts of warmer water temperatures, ocean acidification, sea level rise, and coastal erosion that are projected to change coastal ecosystems, threatening historic fisheries, ecosystem services, and our coastal communities.

The ocean is unpredictable and dynamic, but we have been able to use our observational records to tease out recurring trends such as the El Niño Southern Oscillation and the Pacific Decadal Oscillation to inform our approaches to management. We must now learn to adapt to possible new and unforeseen ocean events such as the warm water blob of 2015 that may not follow a predictable cycle, or recur in a cycle we do not yet understand.

While all this possible doom and gloom may seem overwhelming, we must remember that we have overcome huge environmental problems before. Over the last 50 years our air and water have gotten considerably cleaner and we have brought back several species from the brink of extinction, including California's iconic brown pelican. As the group of individuals responsible for the sustainable management of California's marine resources, staff in the California Department of Fish and Wildlife's Marine Region will remain vigilant. Working with our partners, we will continue to enact data collection and management measures that account for both the anticipated and unanticipated changes we see on the horizon. This will enable us to meet daunting challenges head-on and fulfill our mission to *protect, maintain, enhance, and restore California's marine ecosystems for their ecological value and their use and enjoyment by the public through good science and effective communication.*

- Dr. Craig Shuman, Marine Region Manager

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2018 Marine Region-Wide Updates

Administration

The accomplishments of the Marine Region would not be possible without the work of our administrative staff. Administrative staff work tirelessly behind the scenes to support Region staff, ensuring that they have the tools they need to get the job done. Marine Region administrative staff manage storage and office facilities for staff and vessels, procure supplies for field work, laboratories, and offices while managing and staying within the Region's budget. Administrative staff also help staff conform to state laws and California Department of Fish and Wildlife (CDFW) policies as they work to help the Marine Region achieve its goals.

California Cooperative Fisheries Investigations (CalCOFI)

The Marine Region hosted the 2018 CalCOFI meeting in December that included a [symposium](#) titled "Spatial Dynamics and Organization of Populations in Response to Environmental Parameters." The symposium highlighted current efforts to better understand the spatial dynamics of marine resources in response to environmental factors and the ability to predict or forecast them. Topics included population shifts, egg production, modeling, applications for stock assessments, and other areas with management implications. In addition, the Marine Region joined UC Davis to host a special mini-symposium that included a panel session moderated by Marine Region staff. The mini-symposium focused on "Emerging Tools in Adaptive Management of California's Marine Protected Areas." Staff presented several informational posters about coastal pelagic and highly migratory fisheries, and marine protected area management. Staff also gave a presentation on the MPA Monitoring Action Plan.

Electronic Reporting for Commercial Fisheries Landings

CDFW, in collaboration with Pacific States Marine Fisheries Commission, launched a web-based fish ticket application called "E-Tix" that will be used for all California commercial fisheries landings. E-Tix went live for California state fisheries on July 1, 2018 for a transitional one-year period. The use of E-Tix is a notable accomplishment for CDFW and a significant step forward in modernizing California's fisheries landing reporting system. In addition, CDFW's Data and

Technology Division replaced the outdated Commercial Fisheries Information System with a new, modern Marine Landings Data System (MLDS) to house and manage landings data. All data submitted using E-Tix will be automatically transferred to MLDS twice a day to produce near real-time landing records.

Staff from across the Marine Region played instrumental roles in the Region's transition from paper landing receipts to electronic records, as well as replacing the Commercial Fisheries Information System with the new MLDS. Staff identified data management concerns with the new system and developed changes to field data collection methods to ensure that management needs are met during the transition.

Staff also developed new ways to conduct the needed QA/QC to ensure the maintenance of accurate data when paper receipts are no longer available to compare with the electronic data. Prior to its rollout, project staff spent significant time testing MLDS functionality to identify technical issues and ensure data accuracy and accessibility. In addition to these internal support needs, staff assisted with preparation of outreach materials for fish buyers to inform them of the new processes for submitting and recording landings information.

Marine Life Management Master Plan

At its June 2018 meeting in Sacramento, the California Fish and Game Commission voted unanimously to adopt the [2018 Master Plan for Fisheries: A Guide for Implementation of the Marine Life Management Act](#). Adoption of the 2018 Master Plan was the culmination of over [two years of collaborative efforts](#), and sets the stage for implementation of the plan.

Initial implementation included work throughout the Marine Region on the development of Enhanced Status Reports for various state-managed species, which will be released in 2019. In addition, Marine Region staff worked with partners to develop a socioeconomic guidance document that would inform implementation of the 2018 Master Plan. This document will help staff to build socioeconomic narratives that can be incorporated into management documents (for example Enhanced Status Reports, Fishery Management Plans, and California Fish and Game Commission rulemakings) to better describe socioeconomic conditions and impacts related

to how fisheries are managed. The final guidance document can be accessed at www.opc.ca.gov/socioeconomic-guidance-for-fisheries-management/

New Resources for the Marine Region

The [2018-2019 State Budget](#) allocated new funding and positions to CDFW to (1) continue the current level of service for core fish and wildlife program; (2) augment high-priority programs that are consistent with the priorities identified in the most recent update to the Strategic Vision report; and (3) initiate an independent, service-based budget review and develop a tracking system to support an analysis of CDFW's existing revenue structure and program activities.

The augmentation of high-priority programs included eleven new positions to focus on marine fisheries management and data streamlining. Working in conjunction with CDFW's Data Technology Division, Marine Region staff spent the second half of 2018 filling the new positions and working on the focal areas that include state-managed sustainable fisheries under the 2018 Master Plan for Fisheries, climate change and fisheries, fisheries innovation, whale-safe fisheries, and centralized electronic data collection, monitoring, and reporting.

Whale and Turtle Safe Fisheries

Maintaining whale and turtle safe fisheries continues to be a high priority for the Marine Region. Leveraging existing resources with new positions established in the 2018-2019 budget, we expanded our efforts and prepared for new authority from the State Legislature in an effort to reduce whale and turtle interactions with state-managed fisheries.

The [Dungeness Crab Fishing Gear Working Group](#) met throughout the year to continue to develop the [Risk Assessment and Mitigation Program \(RAMP\)](#). The 2017-2018 Dungeness crab pre-season assessment identified a moderate entanglement risk due to the potential overlap of whale distributions and gear deployment. Aerial surveys conducted shortly after the season opened in both the northern and southern fishery management areas suggested that risk was low because whales were largely offshore, away from the majority of trap gear. In early June, an evaluation team was convened in response to an increase in reported entanglements. Since the season was nearly over and scheduled to close in the area of concern on June 30th, the Working Group recommended a low level of management intervention by encouraging the fleet to follow the Best Practices Guide. During 2018 and 2019

the RAMP will assess entanglement risks for both blue and humpback whales in relation to forage, fishing activity, and ocean conditions. New legislation (SB 1309) gives the CDFW Director interim authority to close the Dungeness crab fishery based on increased marine life entanglement risk while the RAMP is developed. The RAMP will be formalized in regulation on or before November 1, 2020.

The Working Group distributed an [updated Best Practices Guide](#) prior to the 2018-2019 Dungeness crab fishing season, and obtained funding from the California Ocean Protection Council to install solar data loggers on 40 commercial fishing and 20 whale watching vessels. Solar data loggers are expected to improve data streams and allow for real-time analyses of fishing activity and whale distributions.

On November 26, 2018, CDFW formally notified NOAA National Marine Fisheries Service of its intent to pursue an Incidental Take Permit under Section 10 of the Endangered Species Act, which would consider whale and turtle interactions with gear from the Dungeness crab fishery. Additional updates will be available at www.wildlife.ca.gov/Crabs.

New regulations were enacted to reduce the risk of marine life entanglements in commercial Dungeness crab fishing gear. These new regulations establish limits on the number of additional buoys that can be attached at the surface after the main buoy and the maximum length of line.

E-Tix is a notable accomplishment for CDFW and a significant step forward in modernizing the state's fisheries landing reporting system.

State-Managed Marine Programs

These programs are responsible for fisheries managed by the State alone.



Abalone dive survey briefing

photo by K. Joe

Abalone

Recreational Red Abalone Fishery – The red abalone stock continued to decline due to sustained poor environmental conditions along the North Coast. At its December meeting, the California Fish and Game Commission approved keeping the red abalone fishery closed for two more years. During the closure, CDFW will complete work on a fishery management plan which will specify conditions for reopening the red abalone fishery along with other management parameters.

Over the past five years, ocean warming and a massive purple sea urchin population explosion have taken their toll on red abalone. Normal ocean temperatures in recent years have not offset the detrimental effects from the expanded purple sea urchin population, and abalone populations continued to decline.

Dive survey efforts in 2018 covered more than the equivalent of 2.7 football fields across seven fished sites with more than 250 hours spent executing underwater surveys. Reproduction was poor in the fishery with few larvae or newly settled red abalone found during the summer of 2018. Surveys revealed that extremely low kelp and algal abundances, likely reduced by large numbers of herbivorous purple sea urchin, continued from previous years and resulted in significant mortality of red abalone in 2018. Red abalone densities continued to decline, with an overall average density of 0.11 abalone per square meter for seven fished sites (closure trigger is 0.3 abalone per square meter).

Red Abalone Fishery Management Plan Progress – The

Red Abalone Fishery Management Plan's proposed management strategies and frameworks were peer reviewed in 2018, which is a major milestone in the development process. The year started with several public meetings with the Recreational Abalone Advisory Committee and interested stakeholders to present two proposed fishery management strategies, one put forward by CDFW and the other by a Nature Conservancy-led collaborative stakeholder group. Shortly after the public meetings, CDFW worked with the California Ocean Science Trust to develop and conduct the scientific peer review process to critically review the science supporting the two management proposals. The peer review ran from late spring through early fall and the final report was presented to the California Fish and Game Commission in October. The review found that over all, both management proposals were sound, but each had strengths and weaknesses that resulted in a high level of uncertainty in managing the fishery moving forward. The overarching recommendation was to integrate both management strategies to help reduce the uncertainty and capitalize on the best available science. Further recommendations and advice were provided on how to reduce the management uncertainty of all fishery management indicators. CDFW and the California Fish and Game Commission will work with all interested partners in 2019 to continue development of an all-encompassing management strategy that addresses the peer review recommendations and completes the draft fishery management plan.

Abalone Restoration: Captive Breeding Program for Endangered White Abalone – The White Abalone Restoration Consortium (consisting of CDFW, university, federal, and aquarium scientists), which focuses on restoration of this critically endangered species, continued their work in 2018. The growing production of the Captive White Abalone Breeding Program is progressing towards the first ocean stocking of captive-bred animals. To prepare for that next milestone, staff led efforts to scout potential sites for the outplant of captive-reared white abalone. The first outplant is planned for the fall of 2019. Additionally, staff worked with program partners to generate and submit the next grant project proposal to NOAA Fisheries' Section

6 grant program. If successful, the project grant will continue the restoration program for the next three fiscal years starting July 1, 2019.

For more information about abalone, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Invertebrates/Abalone.



Barred sand bass filmed by baited remote underwater video CDFW photo

Barred Sand Bass and Kelp Bass

To help evaluate the 2013 regulation changes for the basses, staff completed 48 sampling trips aboard commercial passenger fishing vessels to collect information on numbers, sizes, and mortality of released fish. Staff collected data on more than 2,093 Kelp Bass and 462 Barred Sand Bass. Most discards were between 13 and 14 inches long. In 2018, three percent of Kelp Bass and 20 percent of Barred Sand Bass released suffered barotrauma. All Barred Sand Bass were released alive, while half of one percent of Kelp Bass suffered release mortality.

Staff submitted a research article about using Kelp Bass to assess trophic indicators of ecosystem health in MPAs (Davis, J.P., Valle, C.F., Haggerty, M.B., Walker, K., Gliniak, H.L., Van Diggelen, A.D., Win, R.E. and S.P. Wertz. 2019. *Testing trophic indicators of fishery health in California's marine protected areas for a generalist carnivore*. *Ecological Indicators*. 97: 419-428. doi.org/10.1016/j.ecolind.2018.10.027). The study was a collaboration between Marine Region scientists on the Southern California Fisheries Research and Management Project and the Statewide Marine Protected Area Management Project. The results showed that non-lethal sampling of fin tissue from Kelp Bass will be effective for future stable isotope studies assessing their feeding level. The study also found that impacts of no-take marine protected areas on kelp forest food webs were variable across locations, and that opportunistic feeding by generalist predators on pelagic sources may mask the effects of management.

Staff completed fishery-independent surveys of Barred Sand Bass for the second consecutive year during fall 2018. Preliminary results from a pilot study in 2017

indicated that Barred Sand Bass were more common during the fall at artificial reefs off Los Angeles County. Results from the pilot study are currently being analyzed and prepared for publication in 2019. Between September and November 2018, CDFW divers and staff completed fall fish surveys aboard the R/V *Garibaldi* at two natural and four artificial reefs near Los Angeles Harbor and the Palos Verdes Peninsula. Standardized counts of Barred Sand Bass were recorded on scuba and baited remote underwater video. An additional survey site was investigated at the Hermosa Beach artificial reef, which appeared promising and will be incorporated into the 2019 survey design. Surveys using both methodologies will continue to provide a long-term dataset of Barred Sand Bass abundance annually.

Staff continued to test the use of length-at-age-based models and management strategy evaluation for managing the bass fisheries. The Data Limited Methods Toolkit is being explored as an option for using management strategy evaluation, with Kelp Bass as one of the new test case species. Staff worked on gathering and analyzing data to be used in the toolkit. A completed manuscript of the Barred Sand Bass age and growth study was submitted for publication.

For more information about bass research and management, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/SCFRMP.



Fish sampling on the Eel River Estuary CDFW photo by A. Frimodig

Bay and Estuary Management

Humboldt Bay – Staff completed the final year of field sampling and associated reporting for a project evaluating the spawning and larval distribution of Longfin Smelt in Humboldt Bay and its tributaries, which was funded by a state wildlife grant program.

In collaboration with California Sea Grant, Humboldt State University, Hog Island Oyster Company and the Wiyot Tribe, staff assisted with the design and implementation of a multi-year project to 1) understand

how physical and biological factors in Humboldt Bay may alter ocean acidification conditions compared to open coastal waters; 2) investigate the extent to which eelgrass reduces the impact of ocean acidification on the growth of commercially grown oysters in Humboldt Bay, and 3) expand eelgrass monitoring within Humboldt Bay as the foundation for a collaborative bay-wide eelgrass management plan.

Eel River Estuary – In collaboration with CDFW's Northern Region, staff participated on the management team for the Ocean Ranch Estuary Restoration Project to restore 473 acres of tidal wetlands in the Eel River estuary. As part of the baseline data collection effort, staff designed and implemented a monitoring plan to characterize the seasonal fish assemblage within CDFW's Ocean Ranch Unit.

Russian River Estuary – Staff completed an accuracy assessment of the 2010 Ocean Imaging marine protected area eelgrass spatial data on the Russian River Estuary, which misclassified 11.36 acres of widgeon grass (*Ruppia maritima*) as eelgrass in that estuary; the determination was made that there is no eelgrass habitat in the Russian River estuary.

Estero Americano and Estero de San Antonio Estuaries – In collaboration with the Environmental Review Project, staff surveyed and mapped eelgrass habitat in these two estuaries located in Sonoma and Marin counties, respectively.

Tomales Bay – Staff received the 2017 Greater Farallones National Marine Sanctuary Tomales Bay eelgrass spatial dataset. These data were incorporated into the Northern California eelgrass spatial dataset, replacing the previous 2013 CDFW Tomales Bay Eelgrass spatial dataset. The dataset is a valuable resource for managing aquaculture leases.

Staff began developing methodology for using unmanned aerial vehicles to map eelgrass habitat and gauge potential associated sport clamming impacts, in collaboration with CDFW (non-Marine Region), GIS, and Invertebrate Management Project staff.

San Francisco Bay – Staff received 2,500 new Bay Shrimp Logs (= 50 logbooks) from the Office of State Publishing. In 2018, staff distributed 900 logs to four of the six active trawlers in the bay shrimp fishery and worked with CDFW's Law Enforcement Division to address bay shrimp fleet compliance issues. Staff also provided boat support to the National Parks Service Golden Gate National Recreation Area for a federal sea cave mapping study.

For more information about bay and estuary management, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/ABMP/Research.



Box crab

CDFW photo by J. Coates

Box Crab

Commercial landings of non-*Cancer* crab species caught incidentally in other targeted trap fisheries increased dramatically in 2017. The interest in (and increased landings of) brown box crab was particularly large. In response, the CDFW Director declared non-*Cancer* crabs to be an emerging fishery in April 2018. CDFW staff developed a regulatory proposal to limit incidental take of these species, which was adopted by the California Fish and Game Commission in October. Concurrent with the regulatory proposal, staff developed a proposal for a collaborative research program with fishermen to investigate the feasibility of creating a target fishery for box crab under experimental gear permits. Recommendations for the program were shaped by constituent feedback through regular communication with CDFW staff, public constituent meetings, and the California Fish and Game Commission's Marine Resources Committee meetings. With support from the California Ocean Protection Council, the research program will use electronic fishery monitoring tools both in studying box crabs and to provide guidance to the State on potential future use of this technique. Experimental permits were approved at the December California Fish and Game Commission meeting and will allow for program initiation in 2019.

For more information about box crab, download the CDFW presentation available at nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=160457.

Researchers confirmed that there is no eelgrass habitat in the Russian River estuary.



Juvenile California Halibut

CDFW photo by B. Mattioli

California Halibut

The California Halibut (halibut) fisheries in Central California continued to be monitored and sampled by staff in the Monterey Bay, San Francisco, and Eureka areas. In all areas, recreational catch and commercial landings increased, primarily due to strong recruitment of legal-sized fish. Commercial trawl and hook-and-line landings and recreational catch were sampled dockside, trawl bycatch samples were collected, and observations were made onboard commercial passenger fishing vessels. Juvenile halibut were collected from a research trawler in San Francisco Bay. Observations of new fishery recruits declined, and most juveniles appeared to be from past recruitment events. Due to previous episodes of good recruitment likely associated with prolonged warm water events three to four years ago, significant amounts of under-sized halibut were encountered in the recreational hook-and-line fisheries for the second year in a row.

Staff have now determined ages for 4,000 halibut otoliths (ear bones) from Northern and southern California by examining thin sections, and an age validation study is under way using captive juvenile halibut injected with oxytetracycline, which marks the otolith.

Staff collaborated with the National Marine Fisheries Service to conduct oral interviews with halibut trawl fishermen about the history of the industry. This project was funded through a grant with Preserve America. Fisherman summary profiles accompanied by selected clips and photos will be made available to the public on CDFW's Finfish Management Project web page, with a link to the full interview and transcript, which will be housed in the NOAA Fisheries "Voices from the Fisheries" database.

The first year of fishery-independent trawl surveys were conducted to begin quantifying an index of juvenile halibut abundance across multiple embayments and nearshore locations in Southern California. Eleven locations from Oceanside Beach in San Diego County to Santa Monica Bay in Los Angeles County were surveyed in spring and fall 2018. During the spring surveys, 247

Fishery-independent trawl surveys began in 2018 to help determine juvenile California Halibut abundance.

halibut ranging in size from 3½ in. to 25 in. (89 to 643 mm) were caught in 85 ten-minute trawls. In the fall, 415 individuals ranging in size from 1.2 in. to 16 in. (32 to 409 mm) were caught in 97 ten-minute trawls. One halibut tagged during the spring surveys was recaptured in the same location in the fall; it was caught in the Dana Point Harbor and grew .66 in. (17 mm) in the five months between surveys. These index-focused trawl surveys and collaboration with the Southern California Bight 2018 Regional Monitoring Program contributed 38 halibut to the Northern/Central California Finfish Research and Management Project's aging study.

Staff developed separate stock assessments for northern and southern California populations of halibut. The process involved analyzing more than 47 years of fisheries, survey, and biological data obtained from a variety of sources, including CDFW, NOAA Fisheries, and the Pacific States Marine Fisheries Commission. Staff applied sex-structured statistical catch-at-age models to those data using the NOAA Fisheries program Stock Synthesis, and critically evaluated the model output. An external peer review panel will be convened to review the results in 2019 after an internal review of the results is completed.

Staff continued to develop a management strategy evaluation for halibut in conjunction with the Data Limited Methods Toolkit project. Staff built an operating model that simulates halibut population dynamics and continues to test this 'virtual fishery' under a wide range of management scenarios. The goal is to determine the likelihood of achieving certain sustainability and performance metrics into the future, given different management approaches.

For more information about California Halibut, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/NCCFRMP/Halibut-Studies and wildlife.ca.gov/Conservation/Marine/SCFRMP/Halibut.



California Sheephead

CDFW photo by M. Elyash

California Sheephead

Staff collaborated with the Sportfishing Association of California to develop sampling protocols and collect California Sheephead for a potential fillet length regulation. A total of 180 California Sheephead collected via live trapping were measured and filleted on three sampling trips at Long Beach, Dana Point and Point Loma. The relationship between total length and average fillet length was used to inform a proposed minimum fillet length. The information was presented to the California Fish and Game Commission as a proposed California Sheephead fillet length regulation.



California spiny lobster

CDFW photo by B. Mattioli

California Spiny Lobster

New regulations to implement the Spiny Lobster Fishery Management Plan went into effect during the 2017-2018 commercial and recreational lobster seasons. Regulation changes included a commercial lobster trap limit of 300 traps, a trap tag program, a new recreational season opening time of 6:00 a.m. (previously midnight), and hoop net marking requirements. Staff produced outreach materials and answered a variety of questions from the public regarding the new regulations.

The 2017-2018 lobster fishing season saw just over

688,000 pounds of lobster landed by the commercial fishery, a 5 percent increase from the previous season (~656,000 pounds were landed in the 2016-2017 season). The 2017-2018 recreational lobster season saw a lobster report card return rate of 50 percent, a rate that has held steady for the last few years. The estimated catch for the recreational fishery was approximately 275,000 pounds, or 29 percent of the total (commercial plus recreational) catch.

In 2018, the first annual review of the Spiny Lobster Fishery Management Plan harvest control rules was completed, evaluating the 2016-2017 season. All three indicators (catch, catch per unit effort, and spawning potential ratio) fell above the threshold value and no management actions were triggered. Staff will continue to monitor and adaptively manage the fishery as prescribed by the fishery management plan, in response to changes in fishery and ocean conditions.

The 2017-2018 commercial lobster season was the first season in which lobster operator permit holders were required to complete and submit an End of Season Spiny Lobster Trap Loss Reporting Affidavit (affidavit, CDFW Form 1020). This new requirement is part of a suite of changes to commercial lobster fishing regulations associated with the fishery management plan. The data collected from the affidavit will help CDFW estimate the number of traps lost during a season as well as inform gear recovery programs and studies aimed at minimizing the impacts of fishing gear interactions in the marine environment.

Upon the conclusion of the 2017-2018 commercial lobster season, CDFW saw an affidavit submittal rate of about 90 percent. The estimated average trap loss per active permit holder was approximately 12 percent of the maximum allowed number of traps (300 traps per lobster operator permit). An updated estimate of trap loss based on the reported number of deployed traps will be provided once commercial lobster fishing logbook data become available.

Due to human health concerns caused by high levels of domoic acid in lobster, waters around Anacapa Island, Ventura County and the east end of Santa Cruz Island, Santa Barbara County were closed to the commercial take of spiny lobster on October 16, 2018, as recommended by state health agencies. Staff coordinated with the California Department of Public Health and the Office of Environmental Health Hazard Assessment to inform the public and commercial fishery participants of the area closures via press releases and updates on the CDFW website. The commercial spiny

lobster fishery closure was lifted on November 16, 2018.

For more information about California spiny lobster, visit the Marine Region website at wildlife.ca.gov/Conservation/Marine/Invertebrates/Lobster. The Spiny Lobster Fishery Management Plan and the first harvest control rule report can be found at wildlife.ca.gov/Conservation/Marine/Lobster-FMP.



CDFW divers practice rescue techniques

CDFW photo by D. Osorio

Diving Safety Program

The Diving Safety Program maintained an enviable safety record in 2018 while supporting an unprecedented level of collaborative dive activity. CDFW divers completed 2,100 dives (amounting to 48½ days under water) while conducting research and monitoring for fisheries and conservation work, and enforcement and light maintenance tasks. In addition to re-qualifying 70 active divers, six new candidates were qualified as CDFW Scientific Divers at the 100-hour training course in the spring.

CDFW's underwater efforts were achieved with the assistance of divers from 18 scientific diving organizations (universities, agencies, and others) that provided 92 visiting divers to work on collaborative projects.

The acquisition of two new breathing air compressor systems funded through the California Ocean Protection Council was a significant infrastructure improvement that will support ongoing fishery management and MPA monitoring efforts throughout California.

For more information about the Diving Safety Program, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Diving-Safety.

CDFW divers completed 2,100 dives, equal to 48½ days under water.



Dungeness crab in recreational crab trap

photo by K. Joe

Dungeness Crab

The 2017-2018 commercial Dungeness crab season opened on schedule in the central management area, but the northern management area opening was delayed due to poor meat recovery results. Although the northern area opened on January 15, 2018, the fleet voluntarily remained tied to the docks until early February given concerns of persistent low crab meat recovery in Northern California. Statewide commercial landings for the season totaled 20.2 million pounds, 75 percent of which was landed in the northern ports. Low meat recovery-associated delays in the northern management area have historically correlated with high crab yields for the region.

In June, CDFW was notified of the allocation of \$25.6 million in federal disaster relief for the 2015-2016 Dungeness and rock crab fishery disasters. CDFW staff held two informational webinars to discuss and receive feedback from the public on disbursement options. A spending plan was developed that allocated the majority of disaster funds to direct payments to industry (\$22.8 million) to build resiliency within the fisheries. The remaining amount will be used for mitigation (\$2.6 million) to help plan and prepare for future domoic acid events. The disaster funding is expected to be received in early 2019.

For the first time, a contract to facilitate the Dungeness Crab Task Force was managed by staff using funds from the Dungeness crab trap limit account. The contract allowed for continued administration of the task force, participation in a task force meeting, and a tour of Northern California ports in October. During the port tour, staff were able to meet with the Dungeness crab fleet to discuss recent changes to the fishery with the passage of the Dungeness crab urgency bill (SB1310) and the fisheries omnibus bill (SB1309). Based on feedback received during the port

tour, staff prepared several "frequently asked questions" documents that include the information on disaster relief, vessel length restrictions, and changes to fair start rules due to domoic acid-related season delays.

New legislation (SB 1309) authorized CDFW to implement a program for the retrieval of lost or abandoned commercial Dungeness crab trap gear left in the water once the fishing season has ended. Staff worked with individuals participating in a pilot retrieval program, the Dungeness Crab Task Force, and the [Dungeness Crab Fishing Gear Working Group](#) to develop the regulations governing this program, which will be available for public comment in early 2019.

The start of the 2018-2019 Dungeness crab season was subject to closures and delays due to both domoic acid and poor results from meat recovery testing. Domoic acid was responsible for a recreational fishery closure in northern Humboldt and Del Norte counties and a commercial fishery delay from Bodega Head to the Sonoma-Mendocino county line from November 15 until December 8. The CDFW Director announced several meat recovery delays for the northern management area with a final date set for January 15, 2019, the latest the area can be delayed due to poor meat recovery test results. At the time of this report, it is unclear when the two remaining areas in Northern California, which continue to test high for domoic acid, will open to fishing.

For more information about Dungeness crab, visit the CDFW website at wildlife.ca.gov/Crabs.



Bull kelp

CDFW photo by R. Flores-Miller

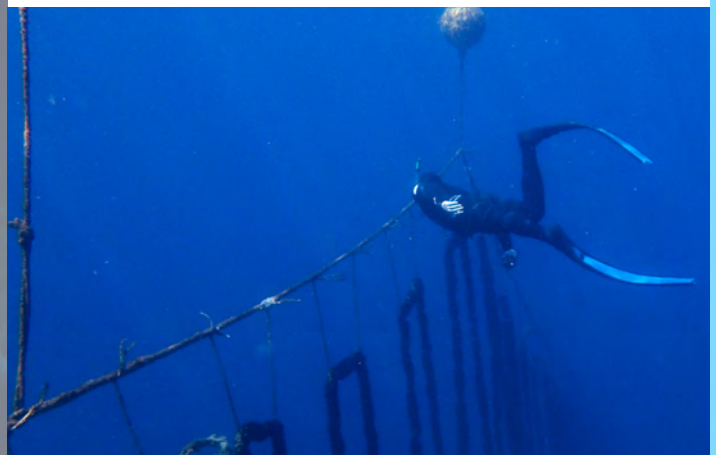
Kelp and Other Marine Algae Management

Staff continued work on the commercial kelp and other marine algae rulemaking, including identifying areas for potential changes, presenting updates to the California Fish and Game Commission's Marine Resources Committee, and meeting with the InterTribal Sinkiyone

Wilderness Council to discuss input and concerns.

Staff provided review and feedback on various permits and projects involving kelp and marine algae, including Letters of Authorization, Wild Broodstock Collection Permits, Scientific Collecting Permits, and commercial kelp harvest plans and kelp bed lease renewal applications. Staff also participated in several working groups and broader collaborative efforts focusing on kelp during 2018. For example, the Greater Farallones National Marine Sanctuary and CDFW Kelp Recovery Working Group developed [recommendations](#) that were approved by the Sanctuary Advisory Council in November. Staff also participated in a Monterey Bay National Marine Sanctuary Advisory Council panel discussion on purple sea urchins and kelp restoration activities, and collaborated with The Nature Conservancy on advancing kelp conservation and science in California.

For more information about kelp and other marine algae, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Kelp.



CDFW diver inspects mussel mariculture operation

CDFW photo by D. Stein

Marine Aquaculture

Staff processed, reviewed, and approved 59 Live Importation Permits, 60 Aquaculture Registrations and nine Restricted Species Permits. Staff also prepared four Budget Change Proposals, three Private Stocking Permits, and four Letters of Authorization.

In collaboration with the State Shellfish Pathologist, State Aquaculture Coordinator, and Director's Aquaculture Disease Committee, staff worked to develop a management response to a newly discovered micro-variant of the oyster herpes virus in San Diego Bay.

Staff completed a survey and summary analysis of 110 acres of aquaculture gear on the 12 state-administered waterbottom leases in Tomales Bay. The results of this study informed the financial surety requirements for

those leases and were distributed to the California Coastal Commission and NOAA Fisheries. Staff worked with the California Coastal Commission to address issues related to gear and infrastructure on a subset of the Tomales Bay leases.

Staff assisted Humboldt Bay shellfish growers maintain compliance with permitting requirements regarding the avoidance of disturbing spawning Pacific Herring.

Staff updated the state waterbottom lease spatial dataset (available on CDFW's MarineBIOS spatial data viewer at wildlife.ca.gov/Conservation/Marine/GIS/MarineBIOS).

Staff performed spatial analysis to determine interactions between lease infrastructure and eelgrass habitat in Tomales Bay, and worked with the Environmental Review Project to provide comments on a State Water Board 401 Certification for Tomales Bay Oyster Company.

Staff coordinated with the State Aquaculture Coordinator and California Fish and Game Commission staff on several administrative and oversight activities related to the state's shellfish aquaculture leases, including: 1) discussion of shellfish aquaculture best management practices and regulations; 2) evaluation of shellfish aquaculture methods through reconciliation of regulatory language; 3) renewal of Santa Barbara Mariculture's state water-bottom lease; and 4) receipt and consideration of Santa Barbara Sea Ranch's new lease application off the coast of Santa Barbara.

For more information about marine aquaculture, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/ABMP/Aquaculture and wildlife.ca.gov/Aquaculture.

an independent Scientific Advisory Committee and included a suite of recommendations for better meeting the OREHP's objectives and goals. To help inform CDFW and the Ocean Resources Enhancement Advisory Panel in their discussions of the evaluation, CDFW partnered with California Sea Grant to gather public opinion on the social values and potential direction of the OREHP from public stakeholder groups in Southern California.

CDFW and California Sea Grant facilitated three town hall meetings to provide an opportunity for stakeholders to comment on the evaluation report's results and recommendations, as well as the future direction of the OREHP. CDFW also accepted written comments from those who were unable to attend the town hall meetings. Preferences for the future of the OREHP varied among stakeholder groups. Most participants expressed interest in continuing the OREHP in some form, whether with White Seabass or another species, particularly California Halibut. Discontinuation of the OREHP was also mentioned by some, with a preference for using collected funds for other efforts that may benefit fisheries and ocean health rather than hatchery operations. CDFW and the OREHP will use the results of the evaluation along with public input to guide the OREHP's next steps and to decide on the future direction of the program.

For more information about the OREHP, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/ABMP/OREHP.



White Seabass release in Dana Point Harbor

CDFW photo by K. Johnson

Ocean Resources Enhancement and Hatchery Program (OREHP)

CDFW, in collaboration with California Sea Grant, released the OREHP [Evaluation Report](#). The report was the result of an extensive multi-year evaluation by



Offloading Pacific Hagfish from a commercial vessel

CDFW photo by T. Tanaka

Pacific Hagfish

In 2018, program staff sampled Pacific Hagfish (hagfish) fishery from Port San Luis, Morro Bay, Moss Landing, and Eureka. Since 2007, despite market demand fluctuations, commercial landings for hagfish have remained relatively stable and have ranged from one to two million pounds annually. Market orders from

Korean importers improved over last year, with hagfish dealers taking all the fish provided by fishermen. However, with the increased demand, ex-vessel price did not increase. While California-caught hagfish are normally exported live to Korea, exporters are experimenting with packaging frozen hagfish. Effort and demand are driven by external market conditions such as the South Korean economy and the fishing activities of Oregon and Washington. Local factors such as bait supply and fuel costs also influence fishing effort.

For more information on Pacific Hagfish, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/NCCFRMP/Hagfish-Studies.



Pacific Herring research on foggy San Francisco Bay

CDFW photo

Pacific Herring

Fishery management plan (FMP) development continued for California's Pacific Herring (herring) fishery in 2018. Through the year, staff worked closely with the FMP Project Management Team on drafting and editing the FMP. Staff also coordinated with California Ocean Science Trust for an external, independent [peer review](#) of the scientific and technical merits of the proposed management strategy, including the harvest control rule framework and essential fishery information. Progress continued on developing ecosystem indicators that will be used to inform the harvest control rule for inclusion in the final FMP, which will likely be presented to the California Fish and Game Commission in 2019.

Staff completed their annual population estimates for herring in San Francisco Bay. Sampling efforts included trawl and egg deposition surveys, as well as coordination with the San Francisco Bay Herring Research Association to continue collaborative research. The 2017-2018 herring season in San Francisco Bay ended with a below average spawning biomass estimate of 15,300 tons. The historical average is 48,500 tons (1979-present), and this was the fourth consecutive

year of below average herring returns. There were 14 spawn events through the season starting in mid-December 2017 and ending in mid-March 2018. The largest spawn event occurred along the San Francisco waterfront in January, which involved an estimated 5,783 tons of herring. Staff also monitored the herring spawning population in Humboldt Bay and Crescent City Harbor, documenting and mapping five and two spawn events, respectively.

The total fishery quota for San Francisco Bay was set at 834 short tons for the 2017-2018 season. Nine commercial fishing vessels participated and landed 611 short tons of herring in San Francisco Bay. The herring fisheries in the northern management areas, Tomales Bay, Humboldt Bay and Crescent City Harbor, remained inactive with quotas set at 350, 60, and 30 short tons, respectively.

For more information about Pacific Herring, visit the CDFW website at wildlife.ca.gov/Fishing/Commercial/Herring and the CDFW Pacific Herring Management News blogsite at cdfwherring.wordpress.com.



Razor Clams

CDFW photo

Razor Clams

2018 marked a second year that the recreational razor clam fishery was closed in both Humboldt and Del Norte counties due to high levels of domoic acid. In Humboldt County, staff collected clams on nine different days between January and November while volunteers in Del Norte County conducted six clam collections between January and August. At least one clam from all sampled areas consistently tested at or above the alert level for domoic acid at 20 parts per million. All 11 razor clams sampled in mid-November were found to exceed the action level and ranged in concentration from 130 to 300 parts per million. For

more information about clams, visit the Marine Region website at wildlife.ca.gov/Conservation/Marine/Invertebrates/Bivalves. For more information about finfish and shellfish health advisories, visit the Marine Region website at wildlife.ca.gov/fishing/ocean/health-advisories.



R/V *Mystinus*

CDFW photo by D. Osorio

Research Vessel Operations

The number of vessels in the Marine Region's research fleet remained unchanged at 15 in 2018, but fleet capabilities were greatly improved. Last year's initiative to enhance capacity culminated in the delivery of one repowered vessel and two new replacement vessels to the fleet. The upgrades and acquisitions were made with support from the California Ocean Protection Council. The new workboats are efficient, reliable, and will make significant contributions to research and monitoring.

R/V *Irish Lord* – This 32-ft. fiberglass workboat originally built in 1987 was repowered with clean, efficient, and reliable outboard engines. The fuel tanks were replaced, and the work deck was reconfigured to improve capacity and workflow. The R/V *Irish Lord's* home port is Ventura.

R/V *Megathura* – The 21-ft. fiberglass workboat was constructed by Parker Marine in 2018. This day-boat can support four divers and conduct trap surveys and light oceanographic work. Since delivery in June, it has supported dive surveys to monitor warty sea cucumber abundance around the northern Channel Islands. The R/V *Megathura's* home port is San Diego.

R/V *Mystinus* – The 29-ft. R/V *Mystinus*, constructed in 2018 by Don Radon Boat Building in Goleta, was purchased with funding from the California Ocean Protection Council in May 2018. Designed as a short-range dive platform with a capacity of six divers, it can also support hook-and-line and trap surveys, light oceanographic work, and remote sensing. The R/V *Mystinus* deployed for 20 field days and more than

200 dives during its inaugural first season from July through October.

R/V *Garibaldi* – The 45-ft. flagship of the Marine Region, based in San Pedro, assisted in a variety of CDFW research studies as well as collaborative studies from San Diego to Point Conception, including the Channel Islands. The vessel was at sea for 118 days on 33 cruises, traveled 3,748 nautical miles, and used 5,539 gallons of fuel. The R/V *Garibaldi* was out of service for four weeks during the year to reinstall an A-frame, trawling winch, and to replace the auto pilot. During this time, other additions and modifications were made to enable the vessel to trawl.



State record Calico Surfperch

CDFW file photo

Saltwater Angling and Diving Records

Five new saltwater angling and diving records were accepted in 2018 (previous records in parenthesis):

Calico Surfperch angling record: 1 lb. 15 oz. (1 lb. 14 oz.)

Grass Rockfish diving record: 6 lb. 7 oz. (6 lb. 3 oz.)

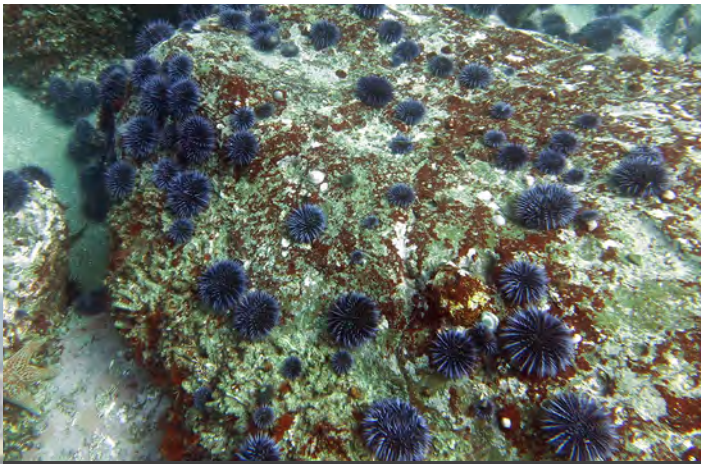
Vermilion Rockfish diving record: 10 lb. 10 oz. (10 lb. 6 oz.)

Canary Rockfish diving record: 3 lb. 4 oz. (this is a new species for the diving record category)

Dolphinfish (dorado, or mahi mahi) diving record: 28 lb. 0 oz. (24 lb. 4 oz.)

For more information about record saltwater fish and invertebrates, visit the CDFW website at wildlife.ca.gov/Fishing/Ocean/Records.

Marine Region research vessel capabilities were greatly improved in 2018.



Numerous purple sea urchins off Fort Bragg

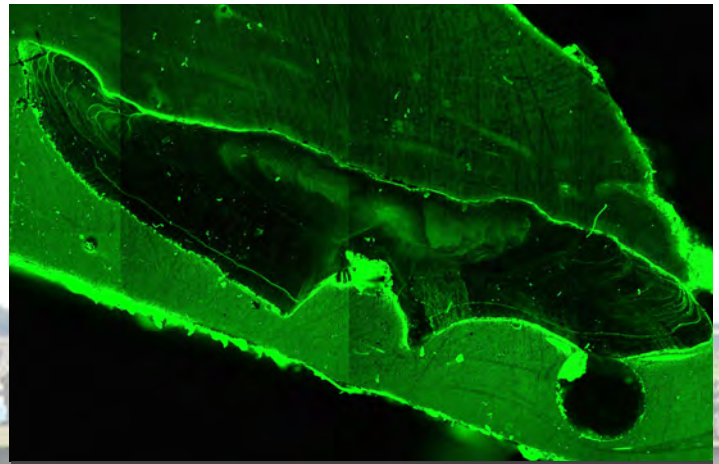
CDFW photo by K. Joe

Sea Urchin

In recent years, purple sea urchins have become so numerous throughout Mendocino and Sonoma counties that food resources for abalone have become greatly reduced, causing starvation conditions for abalone. With increased public interest in reducing purple sea urchin numbers, CDFW staff recommended, and the California Fish and Game Commission adopted, an increase in the recreational daily bag limit from 35 urchins (the general invertebrate bag limit) to 20 gallons for Mendocino and Sonoma counties. This higher bag limit was quickly utilized at several purple sea urchin harvest events at Ocean Cove, Albion Cove and Caspar Cove, coordinated by the Watermen's Alliance and sampled by CDFW. Data from these efforts supported a request by stakeholders that the California Fish and Game Commission increase the bag limit for purple urchins from 20 gallons to 40 gallons in 2019.

Staff have also been key in the formation of the Kelp Ecosystem and Landscape Partnership for Research and Resiliency program (or *KELPRR*) which has drawn more than a dozen partners from agencies, academia, sport diver organizations, environmental groups, and the fishing industry. The organization is addressing the problems caused by the recent explosion in purple sea urchin numbers and how to restore Northern California kelp forests. *KELPRR* partners are developing ecosystem monitoring programs, educational materials, and options for use of harvested urchin materials. For more information about sea urchin, visit the Marine Region website at wildlife.ca.gov/Conservation/Marine/Invertebrates/Sea-Urchin.

Public interest spurred efforts to reduce purple sea urchin numbers in 2018.



Thin-sectioned Barred Surfperch otolith

CDFW photo

Surfperch and Other Surf Fishes

Staff continued to monitor surfperch commercial and recreational hook-and-line fisheries in Central and Northern California. Barred Surfperch and Redtail Surfperch continued to dominate commercial landings and the recreational catch. The Morro Bay port complex is the hub of the Barred Surfperch commercial fishery while Redtail Surfperch are landed primarily in Eureka. Preliminary 2018 statewide Barred Surfperch and Redtail Surfperch annual commercial landings indicate catches were slightly above 10-year averages. Neutral to favorable oceanographic conditions following the 2014 to 2016 El Niño event continued in 2018.

Staff continued collecting essential fishery information using fishery-independent surveys with hook-and-line gear from San Luis Obispo County to Mendocino County, and completed progressive angler surveys to document angler effort along Monterey County sandy beaches. Since 2007 approximately 1,300 fishery-independent surveys have been completed by staff and more than 16,900 anglers have been documented during approximately 500 progressive angler surveys.

In collaboration with San Francisco State University, the lab analysis portion of an age validation study was completed for Barred Surfperch treated with oxy-tetracycline, an otolith marker. A fluorescence laser microscope was used to observe and photograph the otoliths after they were thin-sectioned and mounted on slides. The photos are being examined and measured digitally using Fiji ImageJ software to validate the whole-otolith ageing method.

Staff began developing a management strategy evaluation for Redtail Surfperch in conjunction with the Data Limited Methods Toolkit project. Staff built an operating model for both the recreational and commercial beach fisheries for this species and began evaluating the effects of applying a wide range of management

scenarios to this virtual fishery into the future.

Staff continued to analyze data from the surf fish beach seine study. Preliminary results showed no strong relationships between most environmental factors including temperature, tide height, and tidal flux (incoming vs. outgoing) and fish abundance for each of the project species (Barred Surfperch, Walleye Surfperch, California Corbina, Spotfin Croaker, Yellowfin Croaker).

For more information about surfperch and surf fish studies, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/NCCFRMP/Surfperch-Studies and wildlife.ca.gov/Conservation/Marine/SCFRMP/SurfFish.

Preliminary commercial landing totals for Night Smelt show a 24 percent increase over 2017.

True Smelt

Preliminary commercial Night Smelt landings totaled 219,494 pounds in 2018, increasing 24 percent from 2017. Surf Smelt or “day fish” landings increased slightly from an all-time low of 688 pounds in 2017 to 1,654 pounds in 2018. Historically, both species were targeted in California from Monterey County to the Oregon border; however, the majority of the landings originate in Northern California. These fisheries, commercial and recreational, are shore-based and fishermen use A-frame dip nets for taking Night Smelt and Surf Smelt, while cast nets are also used for Surf Smelt.

For more information about true smelts, visit the CDFW website at www.wildlife.ca.gov/Conservation/Marine/NCCFRMP/True-Smelts



Warty sea cucumber amid feather stars

CDFW/MARE photo

Warty Sea Cucumber

Staff implemented the first commercial seasonal closure to protect spawning groups of warty sea cucumber. The closure, which spans 3½ months from March 1 -June 14 was adopted by the California Fish and Game Commission in 2017 and went into effect for the 2018 season. Staff completed the fifth consecutive year of dive and laboratory research to collect essential fishery information for warty sea cucumber populations at the northern Channel Islands. Staff performed seasonal dive surveys at six different locations (inside and outside of marine protected areas) to measure seasonal changes in densities and to characterize size distributions. This is the first fishery in California where essential fishery information from within MPAs is being actively used for management. To date, more than 4,000 warty sea cucumber have been enumerated and measured, with an additional 2,201 individuals collected and dissected. Data collected by CDFW during this year’s first seasonal closure suggest that spawning aggregations were largely protected by the closure period. A collaborative investigation using a remotely operated vehicle was also performed in spring and fall of 2018 with [Marine Applied Research and Exploration](#) to examine the seasonal depth distribution of warty sea cucumber during spawning and non-spawning periods. The information collected by this remotely operated vehicle research will assist in evaluating the degree to which populations use shallow depths for reproductive purposes and the role that deeper depths may play in providing refuge to warty sea cucumber, which are primarily targeted by divers. In addition, this information will assist in assessing the effectiveness of current CDFW surveys in monitoring populations of warty sea cucumber. For more information about the collaborative warty sea cucumber remotely operated vehicle density study, read the [MPA Management Project newsletter](#).

Catching Surf Smelt with an A-frame dip net

CDFW photo by K. Lesyna





White Seabass school near Anacapa Island

CDFW/MARE photo

White Seabass

Staff continued to collect samples for a study updating the age at maturity for White Seabass. Collaborating with sport fishermen, staff collected an additional 11 samples and 42 individual fish. Collecting fish within the size range needed has been very challenging, but staff anticipate a stronger sampling season in 2019 with the help of additional staff members targeting fishing trips in the Santa Barbara area.

Staff collected and analyzed commercial and recreational data as part of the annual review of the White Seabass Fishery Management Plan for the 2017-2018 season. Staff evaluated the numbers and sizes of White Seabass landed, information on forage fish availability, and socioeconomic data to determine if points of concern had been met. None of the five main points of concern were met for the season and no further action was needed.

For more information about White Seabass, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/NCCFRMP/White-Seabass and wildlife.ca.gov/Conservation/Marine/SCFRMP/White-Seabass.



State/Federal Marine Programs

These programs are responsible for fisheries jointly managed by state and federal entities.



Bin of rockfish offloaded from a commercial vessel

CDFW photo by J.B. Batten

Groundfish

Management and Research – California's sport and commercial groundfish fisheries (which include more than 90 species of rockfish, roundfish, ratfish, skates and sharks) remained within prescribed annual catch limits and accountability measures in 2018 due to active monitoring and management by state and partner agencies and stakeholders.

The regulatory activities for the 2019-2020 groundfish fisheries were finalized in 2018. These resulted in several increased opportunities for California's sport and commercial fisheries, due in part to nearly all overfished stocks being declared rebuilt, and more optimistic stock assessments for Yelloweye Rockfish and Cowcod — two overfished species that continue to limit access to healthy stocks. For Yelloweye Rockfish, less restrictive annual catch limits were implemented for 2019 due to a more positive stock status outlook in the most recent assessment, and the continuing need for stability in groundfish fishing opportunities for California's coastal fishing communities. For Cowcod, due to the stock being projected to be rebuilt by 2019, staff was able to document that there would be low risk to the stock if the annual catch target and allowable fishing depths were increased.

However, not all the new stock assessment information was optimistic, as the Lingcod stock assessment off California was found to be in the precautionary zone. Consequently, recreational anglers in much of California will face a reduced bag limit from two fish to one fish in 2019, while commercial fishermen will experience a reduction in their vessel-based trip limits. Staff answered questions and responded to numerous

comments about the new science and management actions during the 2018 state and federal regulatory processes which implement these reductions, and conducted a number of outreach efforts.

Staff also completed a California Fish and Game Commission regulation change package that will apply the new federal recreational groundfish fishing regulations for 2019 and 2020 in state waters.

In collaboration with federal agency partners and nongovernmental organizations, staff participated in developing recommendations for essential fish habitat for groundfish, and adjustments to the trawl rockfish conservation areas, which are depth-based closures to protect overfished species. The goals were to minimize adverse effects on sensitive habitat that can occur when fishing with trawl gear, to allow increased access to productive fishing grounds, and to increase resource-use efficiency.

Staff provided analyses to inform two Endangered Species Act biological opinions related to take of listed salmon in the Pacific Coast groundfish fishery and the Pacific Halibut fishery. Staff also developed management measures to implement the federal Incidental Take Statements for California fisheries. Staff also participated in reviews of Eulachon and seabirds, other Endangered Species Act-listed species that are taken in the groundfish fishery.

Staff reviewed, supported, and recommended terms and conditions for several new federal Experimental Fishery Permits that will commence in 2019. One will authorize new commercial midwater trawl fishery activities off California, while others have the goal of developing a midwater hook-and-line commercial fishery targeting underutilized midwater rockfish species.

Staff completed a regulation change package for state logbook requirements that the California Fish and Game Commission adopted on December 12, 2018. Starting April 1, 2019, commercial fishermen participating in the federally-managed groundfish trawl fishery will no longer be required to fill out state logbooks.

Staff continue to lead efforts to evaluate visual survey data collected from nearshore waters during remotely operated vehicle studies. Developing a fishery-independent method for determining groundfish abundance in nearshore waters has the potential to

enhance future stock assessments.

Education and Outreach – Staff participated in the biennial Western Groundfish Conference held in February in Santa Cruz by contributing to the planning committee and presenting information about barotrauma in rockfish and the benefits of using various types of descending devices in the recreational groundfish fishery.

With help from CDFW's California Recreational Fisheries Survey project, staff completed 23 outreach assignments during season-opening weekends in the Northern, Mendocino, San Francisco and Central recreational groundfish management areas. Staff provided anglers with more than 400 packets containing the 2018 recreational groundfish regulations, species identification flyers, and information on the CalTIP program. Staff also distributed more than 160 descending devices.

Staff prepared a number of groundfish-related press releases and blog posts in 2018 and maintained and updated several CDFW web pages and our recreational groundfish phone hotline throughout the year.

Visit the CDFW website at wildlife.ca.gov/conservation/marine/groundfish for more information about groundfish.



Offloading commercially-caught Pacific Halibut

CDFW photo by J.B. Batten

Pacific Halibut

CDFW continues to actively manage the recreational Pacific Halibut fishery in California waters. Based on projected early attainment of the 2018 California quota, an in-season fishery closure was implemented on September 21, 2018, following discussions with the International Pacific Halibut Commission, Pacific Fishery Management Council and National Marine Fisheries Service. Final 2018 recreational catch estimates totaled 31,156 net pounds – or 101 percent of the quota. The average net weight per kept fish in 2018 was approximately 24 pounds, the highest in the last ten years.

In 2018, four commercial vessels participated across three of the opening days in the directed fishery; the preliminary landings were 2,457 net pounds. The landings were made into the port of Eureka and sale of the fish produced an estimated \$17,800 in ex-vessel revenue for Northern California coastal communities. CDFW staff were present at the offloads to conduct biological sampling in coordination with the International Pacific Halibut Commission's commercial fishery sampling program. Visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Pacific-Halibut for more information about Pacific Halibut.



Collecting data on commercially-caught tuna

CDFW photo by M. Horeczko

Pelagic Fisheries and Ecosystems

Highly Migratory Species – Involvement in the Pacific Fishery Management Council (Council) process required substantial contributions this year from Marine Region Highly Migratory Species (HMS) Management Project staff representing CDFW in high-priority issues on the HMS Management Team. Team members participated in numerous meetings and contributed reports to support decisions regarding deep set buoy gear, a new commercial gear type to sustainably target swordfish off the West Coast, and adoption of a new methodology for determining bycatch performance metrics in the large-mesh drift gillnet fishery. Staff also contributed to the dynamic management needs for international stocks important to commercial and recreational fisheries such as Pacific Bluefin Tuna and North Pacific Albacore Tuna.

HMS Project staff completed another year of in-season catch monitoring for Pacific Bluefin Tuna and other tunas and expanded commercial dockside Pacific Bluefin Tuna sampling to include smaller volume landings in the hook-and-line and gillnet fisheries. Hundreds of Pacific Bluefin Tuna genetic samples were collected, contributing to a Pacific-wide population study.

Staff continued to improve HMS data quality, revising and enhancing automated error checking through the Commercial Landings Data Improvement Process database management system. The HMS team also coordinated with CDFW's Law Enforcement Division to improve data tools that review permitting and license compliance, and participated in a multi-agency collaborative team to improve and coordinate federal and state HMS data quality, product development and standardization for the Eastern and Tropical Pacific.

Federal Ecosystem Planning – The Marine Region supported the Council's Ecosystem Work Group, participating in climate change scenario planning for the West Coast and initiating a five-year review of the Pacific Coast Fishery Ecosystem Plan for the U.S. portion of the California Current Large Marine Ecosystem. The review consists of revising and updating the goals and objectives of the Council's Fishery Ecosystem Plan to be more specific and measurable, as well as developing an outline of revisions to the plan that reflect updated science and the results of Fishery Ecosystem Plan initiatives.

Coastal Pelagic Species – The Coastal Pelagic Species (CPS) Management Project continued to engage in federal fishery management as members of the Council's CPS Management Team. The team held meetings throughout the year and prepared various reports. Importantly, this work supported the CPS Fishery Management Plan amendment processes for the live bait fishery, setting harvest specifications for Pacific Sardine, evaluating Northern Anchovy management status, and approving exempted fishing permits to provide CPS stock assessment information.

CDFW was a partner in the California Pelagic Species Aerial Survey, which started in 2012 as a collaborative effort with the California Wetfish Producers Association. In addition to regular surveys, staff participated in the California Wetfish Producers Association summer nearshore collaborative survey with NOAA Fisheries, conducting sampling aboard purse seine vessels.

Staff continued dockside commercial CPS fisheries sampling, collecting 97 samples and ageing 575 otoliths for use in stock assessments.

The CPS Management Project participated in various outreach activities, including meetings with the commercial live bait industry and attending the annual California Wetfish Producers Association meeting.

Visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Pelagic for more information about the pelagic fisheries and ecosystem management.



Salmon

At the beginning of the 2018 ocean salmon management cycle, project staff conducted the annual California Ocean Salmon Information Meeting, which attracted about 120 interested stakeholders. Staff provided information on 2017 ocean salmon fisheries, spawning escapement, stock-specific abundance forecasts, and the outlook for 2018 sport and commercial ocean salmon fisheries. Members of the public provided input to a panel of California salmon scientists, managers, and representatives for consideration in the development of 2018 ocean salmon regulations.

Project staff involved on the Klamath River Technical Team coordinated with federal, tribal, and other state agencies to consolidate and summarize catch and other survey information on Klamath River fall Chinook for use in the 2018 management cycle.

Staff participated in the process of drafting 2018 ocean salmon seasons with the Pacific Fishery Management Council and worked together with the

Genetic samples were collected from hundreds of Pacific Bluefin Tuna as part of a Pacific-wide population study.

California Fish and Game Commission and CDFW staff to implement a process to automatically conform sport ocean salmon regulations to federal regulations. Staff produced the *Review of 2017 Ocean Salmon Fisheries* report and several other pre-season reports in collaboration with federal, tribal, and other state agencies. These documents included information on ocean harvest, inland escapement, abundance forecasts, regulatory season alternatives, and final ocean salmon fisheries regulations.

In 2018, a new harvest control rule was implemented to regulate the impact of fisheries on endangered Sacramento River winter Chinook. Project staff participated on an ad-hoc winter run work group in a two-year effort to update the harvest control rule. The updated harvest control rule is expected to be more responsive to changes in abundance because it uses forecast escapement rather than past year averages.

Also new in 2018, after three years of poor spawner returns, both Sacramento and Klamath River fall Chinook met overfished criteria, as established in the Pacific Coast Salmon Fishery Management Plan. Project staff, in collaboration with other agencies, began drafting rebuilding plans for these two stocks. The plans review potential causal factors leading to the overfished status, and specifically assess the roles that freshwater conditions, marine conditions, harvest, and fishery management may have played. Findings from these plans will be used to identify habitat issues hindering salmon survival, and may also be used to guide fishery management until rebuilt status is achieved. The public will have an opportunity to review these rebuilding plans in early 2019.

Due to the overfished status of Sacramento River fall Chinook and uncertainty around its abundance, the Pacific Fishery Management Council took extra precautions to minimize impacts to this essential stock during the 2018 season. As a result of cooperation between industry representatives and regulatory bodies, fishing seasons were curtailed in many months and in most areas, to reduce fishery impact rates on this depressed stock and ensure higher future escapement levels.

During the ocean salmon fishing season, recreational and commercial fisheries were monitored at approximately 20 ports along the California coast. In the commercial fishery, staff sampled approximately 25,800 salmon and collected snouts from more than 7,000 adipose fin-clipped salmon for subsequent coded-wire tag processing. In the recreational fishery, field staff

coordinated with CRFS staff in contacting nearly 24,700 anglers to sample more than 24,200 Chinook Salmon and collect approximately 5,600 heads from adipose fin-clipped salmon. Staff utilized these sample data to produce annual ocean catch and effort estimates by fishery, management area, and half-month period. In conjunction with normal dockside sampling, nearly 3,500 tissue samples were collected in 2018 for a pilot project aimed at investigating the feasibility and utility of conducting genetic analyses to supplement stock composition data from coded-wire tags.

Staff processed approximately 13,100 coded-wire tags from fish caught in the ocean salmon fisheries and uploaded these data, along with their respective catch-sample data, to a publicly accessible data warehouse called the Regional Mark Processing Center. These data are used to determine stock contributions and fishery impacts— information needed to sustainably manage West Coast fisheries and protect California salmon stocks.

Project staff continued work on Constant Fractional Marking analyses, and the results have been published to the Ocean Salmon Project website. Staff completed the 2013 Constant Fractional Marking report this year, and the 2014 report will be available shortly. These reports detail hatchery contributions to inland harvest, escapement, and ocean fisheries, and describe the effects of various hatchery release types, most notably recovery and stray rates. Constant Fractional Marking results will be used widely to evaluate and modify hatchery programs, bay and coastal net pen programs, barge studies, restoration activities, recovery goals, and salmon life cycle model calibrations.

Staff responded to 127 public inquiries received through the Ocean Salmon Courtesy Request Program. Recreational anglers and commercial trollers may request information about their adipose fin-clipped salmon that are sampled by project staff in the field.

Visit the CDFW website at wildlife.ca.gov/OceanSalmon for more information about ocean salmon management and seasons.

Resource Assessment Programs

These programs are responsible for collecting and disseminating recreational and commercial fishery-dependent data.



Scientific aid collects information from a recreational fisherman CDFW photo

California Recreational Fisheries Survey (CRFS)

CRFS field operations are supported by 15 permanent staff and, on average, 65 temporary Fish and Wildlife scientific aids. Annually, CRFS collects data on the catch of more than 100,000 anglers and examines more than 190,000 of the retained fish and invertebrates. In 2018, CRFS conducted several thousand private and rental boat surveys at launch ramps, piers, jetties and breakwaters, and party/charter boat dockside surveys. During these assignments, CRFS samplers collected data on angler effort, demographics, and catch, and collected biological measurements on recreationally caught finfish. CRFS also conducted party and charter boat onboard assignments to collect additional data on fishing location and discarded finfish.

In 2018 CRFS, in collaboration with the Recreational Fisheries Data Project, designed and implemented two beach and bank pilot studies to estimate effort and catch. The new catch rate survey was designed based on recommendations from a national review of CRFS methods in 2011. The survey implemented weighted probability sampling to increase the precision of the estimates and to lower survey costs. Preliminary results show a 20 percent increase in the number of angler interviews with anglers who had completed a fishing trip, using the same level of staffing as the legacy survey. CRFS conducted hundreds of beach and bank catch rate surveys along California's 1,100 miles of coastline. CRFS staff entered the data collected during the field surveys and the pilot studies into the CRFS data system (see Recreational Fisheries Data Project, pg. 21). [California Recreational Fisheries Survey Outreach](#) – CRFS field staff provide outreach to the recreational fishing

CRFS data and estimates are essential for managing California's diverse marine fisheries.

community by sharing informational materials on sportfishing regulations, species identification, marine protected areas, barotrauma and the use of descending devices, whale entanglement, and domoic acid.

For more information about the California Recreational Fisheries Survey, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/CRFS.



Commercial fishing vessel at sea CDFW photo

Marine Fisheries Statistical Unit

Staff collects, processes, and audits commercial fishery landings data, including landing receipts, commercial passenger fishing vessel logbooks, spiny lobster logbooks, and transportation receipts. Staff design, order, and distribute all paper landing receipts and commercial passenger fishing vessel logs for constituents. Marine Fisheries Statistical Unit staff also process all commercial fishery data requests received from commercial fishing license holders and other authorized requestors.



Recreational saltwater fisherman

CDFW photo by E.W. Roberts III

Pacific Recreational Fisheries Information Network (RecFIN)

Marine Region submits California Recreational Fishery Survey (CRFS) estimates to RecFIN on a monthly basis. RecFIN provides a centralized data system to house recreational fisheries information from California, Oregon, and Washington. CRFS and the Recreational Fisheries Data Project staff represent California on the RecFIN Technical Committee, Data and Technology Subcommittee and the Statistical Subcommittee. Through these committees, staff support RecFIN efforts to coordinate the coastwide collection of marine recreational finfish data and procedures for estimating catch, effort and participation. CRFS and the Recreational Fisheries Data Project also collaborated with RecFIN programmers on validating estimates and routines in the new RecFIN database, which was launched in spring 2017. RecFIN enhancements for CRFS data and estimates continued through 2018 and are expected to continue into 2019. For more information about RecFIN, visit the website at www.recfin.org.



CRFS data is used to monitor Yelloweye Rockfish catches

CDFW/MARE photo

Recreational Fisheries Data Project

The Recreational Fisheries Data Project and CDFW's Data and Technology Division staff continued to develop and maintain a data system for CRFS catch,

effort, biological, and spatial data and estimates.

The system includes a centralized relational database to store information, a data entry system with built-in error checks, validation routines to improve data accuracy, and automated reports. The data system increases CDFW efficiency, improves data accuracy and provides the flexibility to align data capture with changing management needs.

CRFS data and estimates are essential for managing California's diverse marine fisheries. CDFW, the California Fish and Game Commission, the Pacific Fishery Management Council, the International Pacific Halibut Commission and the National Marine Fisheries Service used CRFS data and estimates for fishery management in 2018. These uses included: in-season monitoring for species of concern such as Cowcod, Yelloweye Rockfish and Pacific Halibut; developing harvest guidelines; conducting regulatory analyses, and making other critical management decisions. CRFS data were also used in the Marine Protected Area Monitoring Action Plan to examine historical recreational fishing effort across the State as well as local fishing mortality.

Statistical and Technical Support – Recreational Fisheries Data Project staff provided statistical and technical assistance to various projects in support of the management and restoration of fish stocks. These included:

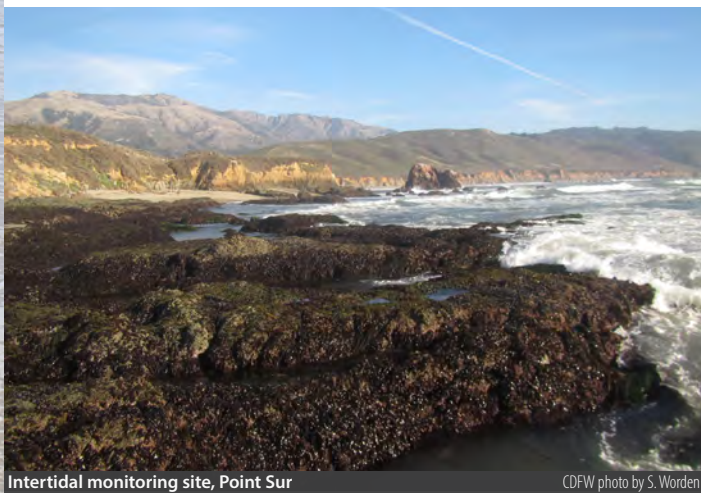
- Providing CRFS data, estimates, and data summaries to various CDFW projects, stock assessors, university researchers, graduate students, the Pacific Recreational Fisheries Information Network (RecFIN), and other State and federal agencies
- Providing advice on use of CRFS data and estimates
- Providing statistical advice on survey design and developing estimation procedures for CRFS pilot studies. These studies are testing use of an online survey to collect recreational fishing effort data, and use of field surveys for collecting recreational catch rate and effort data on beaches and banks
- Providing statistical advice on data analyses for several CDFW research projects including a comparison of the total length of California Sheephead with corresponding fillet lengths
- Reviewing publications that used CRFS data and estimates

For more information about the Recreational Fisheries Data Project, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Recreational-Fisheries-Data

Habitat Conservation Programs

Agreements for Sharing Confidential Data

Staff from CDFW's Marine Region, Office of the General Counsel, and Data and Technology Division worked together to incorporate State data security requirements into new data sharing agreements. Eight data-sharing agreements were approved to allow federal and academic fishery and socioeconomics scientists to incorporate confidential state fisheries data into their project analyses.



Intertidal monitoring site, Point Sur

CDFW photo by S. Worden

Climate Change Activities

Staff participated on the Advisory Group for the Coast and Ocean Summary Report that was published as part of California's Fourth Climate Change Assessment. Staff also provided updates to the Natural Resources Agency on CDFW's current status for actions included within the 2018 and 2014 Safeguarding California documents and the 2009 Climate Adaptation Strategy. Staff participated in several workshops that focused on climate-related topics: monitoring harmful algal blooms to inform seafood safety and fisheries management, integration of ocean acidification hotspots into management of California fisheries, and potential direct and indirect effects of climate change on fisheries and communities. Starting in August, staff also met monthly with individuals from the California Ocean Science Trust and the California Fish and Game Commission, and more recently the California Ocean Protection Council, to discuss the coordination of climate-related efforts. This group noted several federal and state efforts that focus on climate and fishing communities that would benefit from this synergism, and identified several associated

objectives and tasks including a workshop to be hosted by the California Ocean Science Trust in 2019.

Staff participated on the Coastal Ocean Working Group of the State's Climate Action Team. Staff also represented West Coast fishery managers on the California Current Acidification Network steering committee.



Taking samples of mud shrimp in Humboldt Bay

CDFW photo by R. Garwood

Environmental Review and Water Quality Project

During 2018, staff in the Environmental Review and Water Quality Project continued to work on a wide variety of projects, permits, and statewide plans. Staff participated in more than 60 pre-project review meetings and reviewed over 600 environmental documents (plans, surveys, reports, permits, public notices, California Environmental Quality Act, California Endangered Species Act, etc.). The review effort included more than 120 California Environmental Quality Act documents, 90 U.S. Army Corps of Engineers Public Notices, 150 monitoring plans and reports, 40 invasive species survey reports, 85 permits from various agencies and over 50 scientific collection permits. Topics reviewed included: wave energy, desalination plant impacts, power plant impacts, dredging impacts, beach nourishment projects, contaminant site remediation, mitigation projects, California Endangered Species Act impacts, tribal concerns, State Water Resources Control Board policy review, artificial reefs, mitigation proposals, eelgrass restoration, invasive species control projects, Scientific Collecting Permits, aquaculture projects, alternative energy projects, and dock and pier construction impacts. In addition, staff participated

in the review and development of several U.S. Navy, U.S. Marine Corps and U.S. Air Force Integrated Natural Resource Management Plans.

Environmental Review and Water Quality Project Coordination and Collaboration – Staff worked closely with other agencies, applicants, and CDFW regions to coordinate environmental review activities. 2018 activities included:

- Participating on the Humboldt Bay Eelgrass Management Plan Team
- Participating on the CDFW Mitigation Banking Team
- Addressing sand mining, dredging and oyster shell harvesting impacts in San Francisco Bay as part of the San Francisco Bay Conservation and Development Commission
- Participating on the Statewide and Regional Coastal Sediment Management teams
- Participating on the Los Angeles Dredge Material Management Team
- Participating in the development of a monitoring plan to determine impacts to Longfin Smelt from hydraulic dredging operations in San Francisco Bay
- Participating as part of an internal working group to develop a mitigation plan for impacts associated with the Poseidon Desalination Facility in Carlsbad
- Completing Amendment No. 7 for Caltrans San Francisco-Oakland Bay Bridge Seismic Retrofit Project Incidental Take Permit
- Representing CDFW on the newly formed California Ocean Renewable Energy Taskforce
- Participating in several Department of Defense Integrated Natural Resource Management Plan reviews and meetings
- Participating at Beach Ecology Coalition meetings
- Helping to develop and implement structural changes to the CDFW-wide Scientific Collecting Permit program through both a rulemaking change and a new online application and reporting system.
- Developing an online survey for anglers and divers to better understand how artificial reefs are utilized by California's recreationalists.
- Coordinating eelgrass restoration and monitoring efforts with the Morro Bay National Estuary Program
- Completing the 2016-2017 Grunion Spawning Habitat Field Report
- Completing the Mission Bay Ferry Terminal and Water Taxi Project Incidental Take Permit



Marine protected area outreach

CDFW photo by A. Van Diggelen

Statewide Marine Protected Area (MPA) Management Project

California is home to the largest ecologically connected network of MPAs in North America, including 124 MPAs and 14 special closures encompassing 16 percent of state waters. CDFW manages the MPA Network using a partnership-based approach through the [MPA Management Program](#), which includes four core components: 1) outreach and education, 2) research and monitoring, 3) enforcement and compliance, and 4) policy and permitting. This approach ensures that the MPA Network is adaptively managed with active engagement across the ocean community to meet the goals of the [Marine Life Protection Act](#).

Outreach and Education — Staff continue to focus on increasing public awareness to enhance compliance with MPA regulations. More than 14,600 guidebooks; 36,300 brochures; 7,500 posters; 1,300 logo stickers, and 400 information cards were distributed. These publications were shipped to 235 locations such as sporting goods stores, scuba and ecotourism groups, aquariums, schools, parks, campgrounds, harbors, non-profit businesses, commercial fishing enterprises, and various individuals. The [guidebooks and brochures](#) were also available online, through CDFW offices, and at special events.

To spotlight individual MPAs, staff continued writing articles for the Marine Management News blogsite series, [Exploring California's Marine Protected Areas](#). Staff wrote an article that was published in the March-April issue of *Outdoor California*, [Crystal Cove: Exploring California's Undersea Wilderness off Orange County's Protected Wild Coast](#), which featured a state marine conservation area. In addition, two new products were released in 2018, including an MPA educational video

[Safeguarding an Underwater Wilderness](#) and the MPA Management Project [e-newsletter](#).

Through a cooperative partnership with the California Ocean Protection Council (OPC) and California Marine Sanctuary Foundation, interpretive and regulatory signs were developed and installed at key marinas, harbors, and other ocean access points throughout the state. To date, there are 450 signs installed statewide, with 33 “Interpretive Signs” that highlight individual MPAs, 11 “You Are Here” signs, 11 “No Fishing” signs, and four “Harbor” signs installed in 2018.

More than 15,600 students participated in the [MPA Parks Online Resources for Teachers and Students program](#) in 2018. More than 60,000 students have participated since this CDFW and California Department of Parks and Recreation partnership began in 2014. The program connects resource experts in the field with students in their classrooms, and core curriculum teaches students about the MPA Network. Modules have been created for Año Nuevo State Marine Reserve, Point Lobos State Marine Reserve, Crystal Cove State Marine Conservation Area, and Pyramid Point State Marine Conservation Area, that teach students about elephant seals, kelp forests, tide pool ecology, and the salmon lifecycle, respectively.

Research and Monitoring – The Marine Life Protection Act requires the MPA Network be monitored to evaluate progress toward meeting its goals, and that the results of monitoring inform adaptive management decisions. The vehicle for guiding research and monitoring activities across California’s MPA Network is the MPA Monitoring Program. CDFW, OPC, and the California Fish and Game Commission collaboratively lead the MPA Monitoring Program, which includes two phases: 1) regional baseline monitoring and 2) statewide long-term monitoring.

Phase 1 concluded in February 2018, with data and results for the North Coast MPAs described in [technical reports](#) for eleven funded research projects and summarized in a [“State of the Region” report](#). This information was used to develop an initial [5-year management review](#) regarding regional MPA implementation. Phase 1 was completed in the Central Coast in 2013, the North Central Coast in 2016, and the South Coast in early 2017; all [Phase 1 products](#) are available on the CDFW website.

With the completion of Phase 1 for all four coastal planning regions, CDFW, OPC, and the California Fish and Game Commission began to develop Phase 2: long-term, statewide monitoring. To guide long-term

monitoring, CDFW and OPC developed a [MPA Monitoring Action Plan](#) which was adopted by the California Fish and Game Commission and OPC in October 2018. Staff worked with partners to develop quantitative and expert approaches to inform the Action Plan, including co-mentoring three post-doctoral researchers from UC Davis. OPC approved \$9.5 million for long-term monitoring projects, and released a [solicitation for proposals and statement of qualifications](#) on November 1, 2018. Projects will be selected based on their alignment with the Action Plan and will begin data collection in 2019 upon OPC’s approval at their May 2019 meeting.

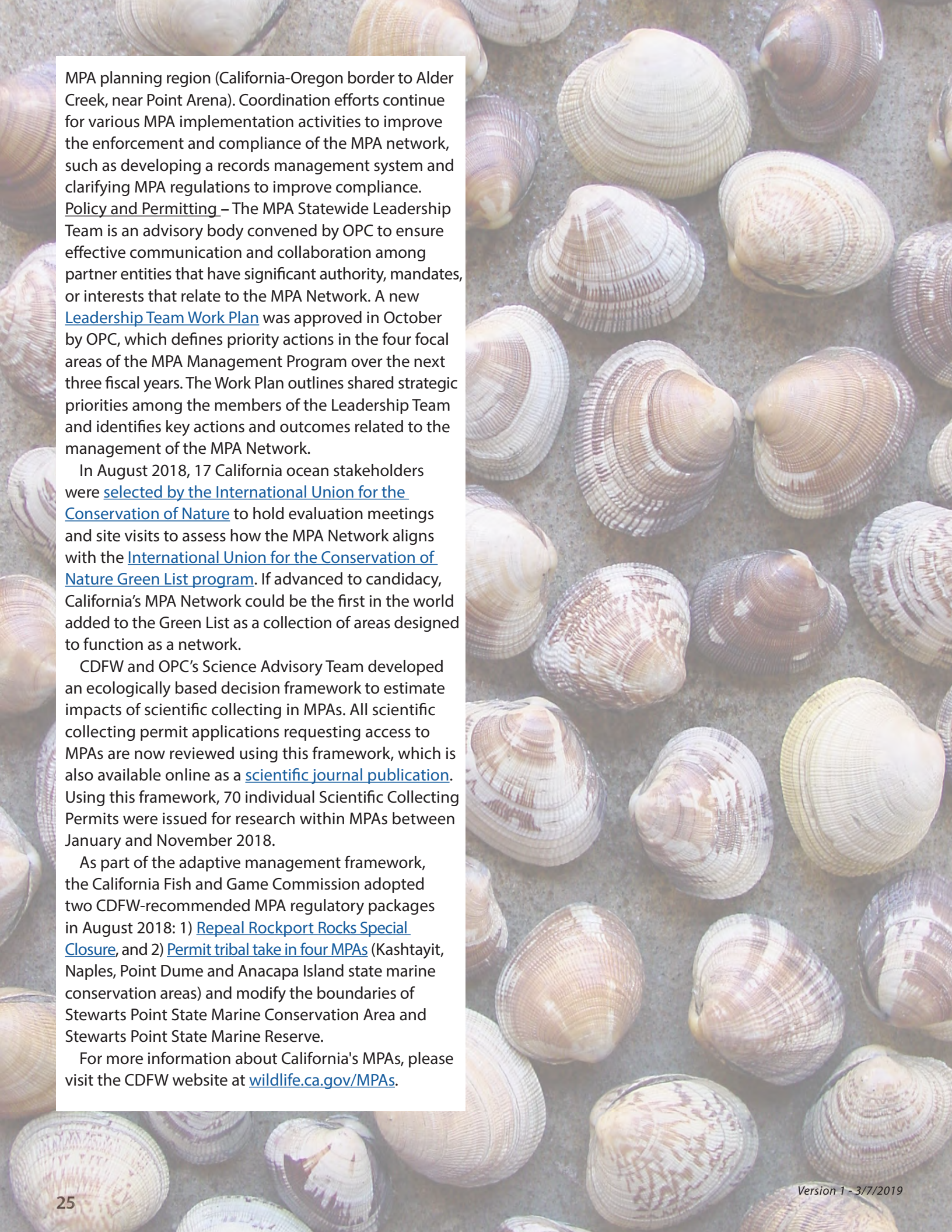
Staff continue to build cooperative working relationships with many of our partners by participating in more than 40 days in the field on research projects in 2018. Collaborators included The Partnership for Interdisciplinary Studies of Coastal Oceans, Reef Check California, the Multi-Agency Rocky Intertidal Network, Redwood National and State Parks – Redwood Creek Estuary, Monterey Bay National Marine Sanctuary, National Oceanic and Atmospheric Administration, National Parks Service, Channel Islands National Marine Sanctuary, Scripps Institution of Oceanography, and Vantuna Research Group. Staff also represented CDFW at more than ten MPA research and monitoring meetings and workshops, and made 19 presentations related to the management of the MPA Network.

Enforcement and Compliance – From January through June 2018, more than 11,000 MPA-related contacts were made by CDFW’s Law Enforcement Division (LED) staff, resulting in 396 warnings and 222 citations.

Assembly Bill 2369 was signed by Governor Brown on August 24, 2018 and will go into effect January 1, 2019. This bill increases the fine amount for a commercial fishing violation (which includes commercial passenger fishing vessels/party boats) in an MPA to be consistent with other illegal-take-for-profit penalties.

Management program staff coordinated with LED to compile, analyze, and interpret LED citation data for the first five years of MPA implementation in the North Coast

MPA research staff and partners spent more than 40 days in the field in 2018.



MPA planning region (California-Oregon border to Alder Creek, near Point Arena). Coordination efforts continue for various MPA implementation activities to improve the enforcement and compliance of the MPA network, such as developing a records management system and clarifying MPA regulations to improve compliance. Policy and Permitting – The MPA Statewide Leadership Team is an advisory body convened by OPC to ensure effective communication and collaboration among partner entities that have significant authority, mandates, or interests that relate to the MPA Network. A new [Leadership Team Work Plan](#) was approved in October by OPC, which defines priority actions in the four focal areas of the MPA Management Program over the next three fiscal years. The Work Plan outlines shared strategic priorities among the members of the Leadership Team and identifies key actions and outcomes related to the management of the MPA Network.

In August 2018, 17 California ocean stakeholders were [selected by the International Union for the Conservation of Nature](#) to hold evaluation meetings and site visits to assess how the MPA Network aligns with the [International Union for the Conservation of Nature Green List program](#). If advanced to candidacy, California's MPA Network could be the first in the world added to the Green List as a collection of areas designed to function as a network.

CDFW and OPC's Science Advisory Team developed an ecologically based decision framework to estimate impacts of scientific collecting in MPAs. All scientific collecting permit applications requesting access to MPAs are now reviewed using this framework, which is also available online as a [scientific journal publication](#). Using this framework, 70 individual Scientific Collecting Permits were issued for research within MPAs between January and November 2018.

As part of the adaptive management framework, the California Fish and Game Commission adopted two CDFW-recommended MPA regulatory packages in August 2018: 1) [Repeal Rockport Rocks Special Closure](#), and 2) [Permit tribal take in four MPAs](#) (Kashtayit, Naples, Point Dume and Anacapa Island state marine conservation areas) and modify the boundaries of Stewarts Point State Marine Conservation Area and Stewarts Point State Marine Reserve.

For more information about California's MPAs, please visit the CDFW website at wildlife.ca.gov/MPAs.

COMMITTEE STAFF SUMMARY FOR JULY 17, 2018

4. HERRING FISHERY MANAGEMENT PLAN

Today's Item

Information Direction

Receive update on draft Pacific herring fishery management plan (FMP) and consider possible committee recommendation.

Summary of Previous/Future Actions

- | | |
|---|--|
| • DFW updates on FMP progress | 2016-2017; MRC meetings |
| • Most recent update on FMP progress | Mar 6, 2018; MRC, Santa Rosa |
| • Today's update and possible recommendation | Jul 17, 2018; MRC, San Clemente |

Background

In 2016, FGC and DFW identified Pacific herring as a priority fishery for developing an FMP under the Marine Life Management Act, an effort that is nearing completion. Pacific herring, an important forage species in California and along the West Coast, is harvested commercially as a roe fishery. The fishery is managed through FGC regulations (Section 163, Title 14) by establishing fishing quotas based on herring spawning population size estimates from DFW surveys.

The goals of the herring FMP are to establish a new harvest control rule, integrate ecosystem considerations, overhaul the existing commercial limited entry permit system and related fishing regulations, as well as develop regulations for the recreational herring fishery.

A collaborative working group of herring fleet leaders, staff from conservation non-governmental organizations, and DFW staff has functioned as a steering committee throughout FMP development; since 2016, DFW staff, the FMP project manager, and steering committee members have provided MRC with regular updates on progress.

In Mar 2018, the FMP project manager presented a detailed update on development, scope, and timing of an FMP for Pacific herring; this included a new predictive model developed for San Francisco Bay populations, the proposed management strategy, new ecosystem analysis and collaborative research protocols, and proposed regulatory changes, including addition of a recreational take limit. MRC also discussed a request from some commercial fishermen to authorize a new commercial gear type (cast nets) for purposes of a small-scale, fresh fish market. Based on discussion, DFW agreed to add a provision within the FMP that could allow for future gear type authorizations through subsequent rulemaking.

Today, DFW will present a refined scope of proposed fishery regulation and permitting requirements, and an update on timing for FGC receipt of the draft FMP and proposed implementing regulations following peer review. This is an opportunity for MRC to clarify any details of the plan and consider a recommendation to move the FMP process forward for FGC consideration.

COMMITTEE STAFF SUMMARY FOR JULY 17, 2018**Significant Public Comments**

Previously, recreational fishermen that target herring in San Francisco Bay provided comments about the DFW-proposed new recreational daily limit of 50 pounds. The majority of fishermen indicated the proposed limit is too little, based on the ephemeral nature of herring spawning events close enough to shore to access them and their practice of collecting sufficient volume for use and freezing for the coming year. Most suggest a limit of two, 5-gallon buckets, which amounts to approximately 100 pounds but doesn't require a scale (see Exhibit 2).

Recommendation

FGC staff: (1) Support DFW recommendations for the proposed FMP and implementing regulations, except provide direction for recreational take limits in the proposed regulation, which could be reflected as a range for later FGC selection; and (2) approve the updated schedule for FGC action as recommended by DFW.

DFW: Revise the FMP and rulemaking schedule as presented (Exhibit 1).

Exhibits

1. DFW presentation
2. Emails from Krishna Dole, John Vogel, Pinghua Xiong, Josiah Clark, Andrew Bland, Alastair Bland, Mark Lockaby and Nathan Lee, received Mar 5, 2018

Committee Direction/Recommendation

The Marine Resources Committee recommends that the Commission endorse the CDFW-identified recommendations for the Pacific herring fishery management plan and implementing regulations, and update the FMP and rulemaking schedule as proposed by CDFW.

OR

The Marine Resources Committee recommends that the Commission endorse the CDFW-identified recommendations for the Pacific herring fishery management plan and implementing regulations, except to also specify a proposed recreational take limit of [amount or range], and update the FMP and rulemaking schedule as proposed by CDFW.

STAFF SUMMARY FOR OCTOBER 17, 2018

11. RED ABALONE FISHERY MANAGEMENT PLAN

Today's Item

Information Action

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

Summary of Previous/Future Actions

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

Background

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

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

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

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

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

Significant Public Comments (N/A)

Recommendation

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

Exhibits

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

Motion/Direction (N/A)

COMMITTEE STAFF SUMMARY FOR NOVEMBER 14, 2018

5. RED ABALONE FISHERY MANAGEMENT PLAN (FMP)

Today's Item

Information Action

Discuss next steps in addressing peer review recommendations and completing the red abalone FMP.

Summary of Previous/Future Actions

- FGC supported red abalone FMP development per MRC recommendation Oct 8, 2014; Mt. Shasta
- DFW updates to MRC on FMP process 2015-2017; MRC meetings
- Received update on FMP process Dec 6-7, 2017; San Diego
- Discussed FMP scope and content Apr 18-19, 2018; Ventura
- Last update on FMP schedule Aug 22-23, 2018; Fortuna
- Received peer review results for draft FMP Oct 17, 2018; Fresno
- **Today MRC discusses next steps Nov 14, 2018; MRC, Sacramento**

Background

Since 2014, DFW has been developing a red abalone FMP for adoption by FGC, with regular updates to MRC and FGC on the process, progress, and stakeholder input. DFW abalone project staff have also kept FGC and MRC updated on the unprecedented environmental conditions on the north coast and subsequent biological impacts to abalone, and how those are affecting the FMP process and possible provisions. For a more detailed background on the process to date, see Exhibit 1.

This year, attention has focused on two proposed harvest control rules (HCRs) for the FMP: the DFW-recommended HCR, and an alternate HCR option proposed by The Nature Conservancy using stakeholder-developed metrics. FGC supported analysis of both HCRs through an external, independent scientific peer review convened by the California Ocean Science Trust (OST), with support from the California Ocean Protection Council.

At the Oct 2018 FGC meeting, OST presented results and recommendations from the peer review (Exhibit 2). In particular, the peer review panel highlighted that a management strategy employing a combination of aspects from each HCR may be more robust against uncertainty under different fishery conditions, and recommended an analysis to determine how to best integrate them. FGC referred to MRC for this meeting a discussion of next steps and possible pathways to respond to the peer review recommendations. DFW will provide an update.

Significant Public Comments (N/A)

Recommendation

FGC staff: Clarify DFW feedback on peer review recommendations, including alternative approaches to evaluating HCR integration, and schedule follow-up discussion for Dec FGC meeting.

COMMITTEE STAFF SUMMARY FOR NOVEMBER 14, 2018

Exhibits

1. Staff summary for Agenda Item 11, Oct 17, 2018 (for background purposes only)
2. OST red abalone FMP peer review report, dated Oct 2018

Committee Direction/Recommendation (N/A)

Date: March 6, 2019
RE: Abalone Management
Dear Commissioners:

I want to take this opportunity to thank the Commission for their involvement and guidance regarding northern California's recreational red abalone fishery and the proposed FMP. California's abalone fishery, even among stakeholders and scientists, has historically been contentious. To the Commission's credit, you have taken the unusual step of allowing an independent peer review of an outside collaborative proposal between TNC and fishermen, along with the CDFW's proposal. You have also asked the CDFW, TNC and fishermen to work together to integrate the two proposals. In addition, you've directed that the FMP goals be revised to allow for a *de minimis* fishery. If our current efforts are successful to accomplishing these goals, the process could be a blueprint for other fisheries, including the southern abalone fishery. Additionally, we should not only end up with the best possible fishery management plan for a recovering, sustainable fishery, but also very important, the process will have been inclusive and transparent. I don't think fishermen could have expected more than what you've asked to be done. Now we just have to make it happen and I look forward to helping reach those goals.

I simply want to say that from someone who has been involved as a fishing advocate for many years, I appreciate the Commission's leadership and am looking forward to working with the CDFW, TNC and the Commission to produce the best possible outcome.

Sincerely,

Jack Likins
Recreational Abalone Fisherman

DRAFT Marine Life Management Act Master Plan: Implementation Work Plan, 3/12/19

Background

The Marine Life Management Act Master Plan (2018 Master Plan) was adopted by the Fish and Game Commission (FGC) in June 2018. The 2018 Master Plan, which updates the original 2001 Master Plan, provides guidance and a toolbox for implementing the Marine Life Management Act (MLMA) goals and objectives. To help ensure that the 2018 Master Plan is implemented effectively, it specifies the development of an Implementation Work Plan (Work Plan).

Structure and Content

To aid in the successful implementation of the 2018 Master Plan, the Work Plan incorporates the following two characteristics:

1. The Work Plan must clearly capture the range of activities that are required to implement MLMA-based management over the next several years. These include fishery prioritization and scaling components from the 2018 Master Plan as well as routine ongoing activities and new statutory mandates.
2. The Work Plan must be adaptable to reflect change as specific tasks reach completion and others are initiated. In many cases, the results from completed tasks will inform the development of new tasks. For instance, the prioritization and scaling tasks within the MLMA-based management “Framework” will inform the decision (and resulting tasks) regarding which species currently need more focused management.

The Work Plan incorporates these two characteristics through seven key elements. The tasks listed under these elements reflect current or soon-to-be implemented work. Partners supporting specific tasks are noted and an anticipated time frame is provided. Stakeholder engagement and peer review, as described in the 2018 Master Plan, are crucial to the successful implementation of the MLMA across most of the elements listed below. When specific stakeholder engagement and peer review activities are identified, they will be added as Work Plan subtasks.

Plan Updates

Following presentation of the draft Implementation Work Plan to the FGC Marine Resource Committee (MRC) in March 2019, the final Work Plan will be submitted to the FGC in June. It is anticipated that regular updates will be provided to the MRC and, as requested, to the FGC Tribal Committee and FGC at their scheduled 2019 and 2020 meetings.

Work Plan

Time Frame: Annual, Ongoing, PC (Proposed Completion), TBD (To Be Determined)

Acronyms for partners provided below Element VII

I. MLMA Framework - Prioritization		
Tasks	Partners	Time Frame
Fisheries Set #1: Key finfish plus Bay Shrimp, CA Spiny Lobster, and Market Squid		
<ul style="list-style-type: none"> Conduct Ecological Risk Assessment (ERA) and combine with Productivity & Susceptibility Analysis (PSA) to produce rankings 		PC July 2019
<ul style="list-style-type: none"> Apply socioeconomic and climate considerations to high ranking fisheries 		PC Aug 2019
<ul style="list-style-type: none"> Engage stakeholders: ERA + PSA prioritization results; socioeconomic and climate considerations; next steps (scaling) 	Engagement opportunity for CA Tribes and interested stakeholders	PC Sep 2019
<ul style="list-style-type: none"> Present prioritized list for Fisheries Set #1 to FGC 		PC Oct 2019
II. MLMA Framework - Scaling		
Tasks	Partners	Time Frame
Highest Priority Fisheries (Set #1): conduct evaluation (degree of management change needed; fishery complexity) to determine appropriate management scale	Specific engagement opportunities for CA Tribes and interested stakeholders will be added to the Work Plan as they are identified	PC Feb 2020
III. Scaled Fishery Management Documents: Development		
Tasks	Partners	Time Frame
Develop Enhanced Status Reports (ESRs) for 35 Species	Fathom Consulting, Strategic Earth, SeaChange Analytics, OPC	PC June 2019
Generate Pacific Herring FMP	SeaChange Analytics, Pacific Herring FMP Steering Committee	Proposed Adoption by FGC: Oct 2019
Generate Red Abalone FMP	TNC, CA Tribes, Fishermen	Proposed Adoption by FGC: Summer 2020
Address priority fisheries (Set #1) at appropriate scale identified in II	TBD	TBD
IV. Managing Fisheries		
Tasks	Partners	Time Frame
Monitoring/Research		

California Department of Fish and Wildlife

<ul style="list-style-type: none"> • Long-term fishery-dependent and – independent data collection 	Various Partners; supplemental resources and/or partnerships could expand scope of this effort	Ongoing
<ul style="list-style-type: none"> • Research to address information gaps identified in ESRs 	Supplemental resources and/or partnerships could expand scope of this effort	Ongoing
<ul style="list-style-type: none"> ○ Use Remote Operating Vehicle to evaluate habitat use by warty sea cucumbers and MR survey effectiveness in monitoring populations of this species 	Marine Applied Research and Exploration,	PC June 2019
<ul style="list-style-type: none"> ○ Examine climate change impacts on the sustainability of key fisheries of the CA Current System 	SIO, SDSU, NOAA Fisheries	PC 2020
<ul style="list-style-type: none"> ○ Use Baited Remote Underwater Videos and SCUBA surveys to determine relative abundance of Barred Sand Bass over time at natural and artificial reef sites 		PC 2020
<ul style="list-style-type: none"> • Experimental Gear Permit Study 		
<ul style="list-style-type: none"> ○ Initiate Box Crab monitoring as part of the experimental Box Crab collaborative program 	Fishermen, FGC, PSMFC, OPC	Proposed start in April 2019
Data Analysis and Stock Assessments		
<ul style="list-style-type: none"> • Generate CA Halibut stock assessment 		PC Fall 2019
<ul style="list-style-type: none"> • Improve recreational catch estimate for CA Spiny Lobster 		TBD
Review Analytical Results and Develop Management Options		
<ul style="list-style-type: none"> • White Seabass and CA Spiny Lobster status as determined through process outlined in FMPs 		Annual
<ul style="list-style-type: none"> • Market Squid status as determined through egg escapement evaluation 		Dependent on sampling
<ul style="list-style-type: none"> • Cabezon, Greenlings, and CA Sheephead landings against TACs 		Annual
<ul style="list-style-type: none"> • Kellet's Whelk and Sheep Crab landings against TACs 		Annual
<ul style="list-style-type: none"> • Pacific Herring spawning biomass estimates 		Annual
<ul style="list-style-type: none"> • Northern CA Red Abalone status 	Various	Annual
<ul style="list-style-type: none"> • Dungeness Crab meat quality evaluation 	Fishermen, PSMFC, CDPH, OEHHA	Annual
<ul style="list-style-type: none"> • Dungeness Crab, Rock Crab, and CA Spiny Lobster domoic acid level evaluation 	Fishermen, CDPH, OEHHA	Ongoing
<ul style="list-style-type: none"> • Razor Clam domoic acid level evaluation 	Fishermen, CDPH, OEHHA	Ongoing
Identification of Management Measures and Development of Regulations		
<ul style="list-style-type: none"> • Hagfish traps permitted on single vessel 	FGC	June 2019

• Commercial kelp and algae harvest management: phase 2	FGC, InterTribal Sinkyone Wilderness Council	TBD
V. Outreach		
Tasks	Partners	Time Frame
Implement CA Fisheries Portal		
• Design CA Fisheries Portal, includes layout for ESR text	Fathom Consulting, Strategic Earth, Waterview Consulting, OPC, CA Tribes, Stakeholders	PC June 2019
• Build website for CA Fisheries Portal and add ESR text	To be determined	TBD
Provide regular updates at FGC Marine Resource Committee and Tribal Committee meetings		Ongoing
Assist with Dungeness Crab Task Force elections	OPC	Biennial
Outreach to fishermen through port discussions		Ongoing
Build partnerships to support implementation	Academics, Non-government entities, Fishermen and member groups, CA Tribes, Other constituents	Ongoing
VI. Implementing New Programs		
Tasks	Partners	Time Frame
Implement Experimental Fishing Permit Program: California Fisheries Innovation Act of 2018 (AB 1573)		
• Develop program and design and implement regulations governing program	Fishermen, TNC, FGC	PC Dec 2019
Implement Risk Assessment and Mitigation Program (RAMP): SB 1309		
• Develop program and design and implement regulations governing program	Dungeness Crab Task Force, Dungeness Crab Fishing Gear Working Group, FGC	PC Oct 2019
Implement Gear Retrieval Program for Dungeness Crab Traps: SB 1309		
• Develop program and design and implement regulations governing program	Dungeness Crab Task Force, Dungeness Crab Fishing Gear Working Group, FGC	PC July 2019
Implement Standardized Gear Marking Program: SB 1309		
• Develop program and design and implement regulations governing program	Fishermen, FGC	PC Nov 2019
Implement Disaster Relief Programs		
• Dungeness and Rock Crab 2015-2016 fishery disaster: mitigation plan	PSMFC, NOAA Fisheries	TBD
VII. Improving MLMA Fisheries (Ecological, Social, and Management Systems) Including Adaptive Capacity		
Tasks	Partners	Time Frame

Data modernization and review		
• Transition from paper commercial landing receipts to electronic receipts	PSMFC	PC July 2019
• Review and evaluate logbooks		TBD
Data-Limited Methods Toolkit (includes Management Strategy Evaluation for evaluating management options)		
• Test data-limited methods tool on eight state-managed species	NRDC, UBC, SeaChange Analytics, OPC	PC Jan 2020
Data collection methods		
• Assemble lessons learned from key observer/electronic monitoring programs	Conservation Strategy Fund	PC 2019
• Evaluate use of remote operating vehicles for collecting sea cucumber data inside and outside of MPAs	Marine Applied Research and Exploration	PC June 2019
• Evaluate use of electronic monitoring for vessels participating in box crab experimental fishing program		TBD
Improving Fisheries Management Responsiveness and Fishing Community Adaptability	Supplemental resources and/or partnerships could expand scope of this effort	
• Investigate ways to increase management responsiveness and fishing communities' resilience to changing ocean conditions	FGC, OPC, OST, PFMC	Ongoing
• Support development of port profile descriptions	NOAA Fisheries, FGC, CA Sea Grant	PC Sept 2019

Partner Acronyms

CDPH: California Department of Public Health

NOAA Fisheries: National Oceanographic and Atmospheric Administration, National Marine Fisheries Service

NRDC: Natural Resources Defense Council

OEHHA: Office of Environmental Health Hazard Assessment

OPC: Ocean Protection Council

OST: California Ocean Science Trust

PFMC: Pacific Fishery Management Council

PSMFC: Pacific States Marine Fisheries Commission

RLF: Resources Legacy Fund

SDSU: San Diego State University

SIO: Scripps Institution of Oceanography

TNC: The Nature Conservancy

UBC: University of British Columbia

STAFF SUMMARY FOR NOVEMBER 4, 2015

8. FISHING COMMUNITIES

Today's Item

Information Action

Explore the developing concerns about the sustainability and vitality of California's fishing communities and ports and what, if any, role FGC has in this issue.

Summary of Previous/Future Actions

- MRC initial discussion Mar 4, 2015; Marina
- **Today's scoping** **Nov 4, 2015; Ventura**

Background

Eleven public ports and numerous harbors dot the coast and waterways of California. Adjacent coastal communities that are reliant on certain fisheries and the fish harvesting industry are often referred to as "fishing communities," at various scales. Fishing communities depend on a number of conditions and players to sustain their vitality.

Over the past 15-plus years, many fishing communities have been confronted by challenges associated with changes in fishing or economic opportunity. Examples of challenges include fisheries management changes (e.g., management responses to address overfishing, overcapitalization and excess capacity in fisheries; loss of fish habitat, and fishery/area closures for species listed under the Endangered Species Act or federal rebuilding plans); environmental fluctuations in diversity, abundance, and distribution in fish assemblages, including those associated with climate change; and economic challenges related to increased competition in the global marketplace, and the recent economic downturn in general. The destabilizing effect of these challenges, and fishing/coastal community vitality and resilience, is a topic of active conversation along the Pacific coast, and nationwide (see exhibits 1-4).

FGC referred this agenda topic to MRC in 2014 following a petition from three northern California fishermen for new permits to fish for a more southerly species that had shown up in unusually high numbers due to warm water conditions. The petitioners, as well as supporters from northern California fish businesses and city representatives, made their case in support of the petitions based on the economic needs of local coastal communities reliant on fishing. While the specific request could not be granted without a lengthy regulatory and stakeholder process, FGC asked MRC to explore the issue of coastal community needs and the highlighted concerns.

Originally scheduled for discussion at the March 2015 MRC meeting, time constraints only allowed for an initial and very limited discussion. Today, staff will initiate further conversation with an overview of "fishing communities," guiding principles from the MLMA, and a report on current initiatives underway in California at the federal and local levels. One of the goals today is to hear from community members themselves, who are vital to clarifying the scope of the issues relevant to California fishing communities (see exhibits 5 and 6 for some perspectives originally submitted for the March 2015 MRC meeting).

STAFF SUMMARY FOR NOVEMBER 4, 2015**Significant Public Comments**

1. Assemblyman Jim Wood has expressed concerns about the needs of northern California coastal communities (Exhibit 5)
2. The California Wetfish Producers Association (CWPA) supports discussing the big big-picture issue of sustainable harbor communities (Exhibit 6)

Recommendation

Solicit public input on the scope of issues of concern regarding California's fishing community vitality and resilience, and evaluate if there are areas where FGC can play a role. What types of views, values, and concerns do different stakeholders, including coastal fishery participants, currently hold, and what can contribute to resilient fishing communities? What is the role that fishermen and local communities can play, that FGC and its policies can play, and how can stakeholders effectively engage and represent the concerns of their communities to help create more efficient and effective management?

Exhibits

1. California Sea Grant Extension Program webpage on fishing communities (<https://caseagrants.ucsd.edu/project/discover-california-commercial-fisheries/fishing-communities>), accessed Feb 26, 2015
2. Ocean Protection Council webpage on preserving California's fisheries (<http://www.opc.ca.gov/2010/01/preserving-californias-fisheries/>), accessed Oct 28, 2015
3. Maine Sea Grant, Best Practices for Working Waterfront Preservation: Lessons Learned from the Field, Mar 2013
4. National Working Waterfront Network webpage for Trinidad Harbor case study (http://www.wateraccessus.com/case_print.cfm?ID=31), accessed Oct 28, 2015
5. Letter from Assembly Member Jim Wood, received Jan 26, 2015
6. Email from Diane Pleschner-Steele, CWPA, received Feb 12, 2015

Committee Direction

Provide guidance on next steps to consider fishing community needs.

California Fish and Game Commission Marine Resources Committee

Staff Report on California Coastal Fishing Communities Meetings

July 2018

At the direction of the California Fish and Game Commission (Commission) and the Marine Resources Committee (MRC), Commission staff hosted a series of coastal fishing communities meetings to receive public input on issues of concern affecting the vitality and resilience of California's fishing communities, and the areas in which the Commission can play a role to foster greater stability and long-term vitality. This report provides a brief background on the impetus for this project, an overview of the coastal fishing meetings and questions posed to participants, a summary of key findings, and initial ideas generated from the meetings for MRC to consider preparing fishing communities for future resilience. The information is intended to support MRC discussion and guidance on potential options and approaches to prioritize for further development and public input.

Background

In 2014, the Commission received a petition from three commercial fishermen in northern California requesting new fishery access adjacent to their port. While the request was to obtain small-scale experimental access to a restricted access fishery for a species that had become more locally abundant due to climate-driven shifts in distribution, the expressed intent was to support north coast harbors and fishing communities. The Commission requested that MRC schedule a discussion about the request and the community needs behind it. Following exploratory discussions with MRC in 2015, FGC directed staff to hold a public meeting to more comprehensively explore the concerns and needs of fishing communities.

A statewide meeting was held in Petaluma in July 2016. Over 40 members of the public attended, including commercial and recreational fishermen, fish processors, city and county elected officials and staff, environmental non-governmental organizations (NGOs), social scientists, and California Sea Grant staff. Participants emphasized that there were many changes and needs in their communities that could not be met under current management and policy conditions, and urged the State to more directly recognize community goals and the impact of different options on those communities while pursuing conservation and utilization goals in its fisheries management decisions. The meeting revealed that there was value in continuing the discussion; the Commission subsequently approved an MRC recommendation to broaden the conversation coast-wide through a series of locally-focused coastal fishing community meetings across the California coast. The goal of these meetings was to identify challenges facing individual coastal fishing communities and discuss strategies for building more resilience in the face of external stressors that included changing climate, ocean and economic conditions.

Seven locally-focused coastal fishing community meetings were held along the coast from June 2017 through June 2018 in Smith River, Fort Bragg, Montara/Half Moon Bay, Monterey, Atascadero, Ventura and San Diego. Attendance at each meeting ranged from 15-35

members of the public. The meetings offered a venue to more thoroughly explore, from the perspective of specific fishing-dependent coastal communities, current conditions and changes being experienced in different ports, constraints on adaptation, and needs for creating future resilience. The meetings were not only intended to inform the Commission, but to draw directly from the experience and expertise of community members to help generate ideas and potential pathways forward to adapt fishing practices or permitting structures in the face of changing fisheries and ocean conditions.

Coastal Fishing Community Meeting Highlights

The coastal fishing community meetings were structured to include an introduction from Commission staff and participating commissioners. Each of the five commissioners was able to attend at least one meeting. Staff provided an overview of the Commission's role in implementing the State's vision for managing the State's commercial and recreational fisheries, the Commission's authority to set policies and regulations for fisheries in California's state waters (0-3 miles from shore), and answers to questions from the audience. For several of the meeting, port profiles were prepared and distributed to support the discussions (see Appendix B).

Group Discussion

At each fishing community meeting, staff overviews were followed by a full group discussion organized around a progression of exploratory questions to solicit input on:

- 1) The unique challenges faced within each fishing community;
- 2) How fishermen are adapting to these challenges;
- 3) The ideal vision for the future of each port; and
- 4) How the Commission can respond to help address challenges, facilitate adaptation, and support the future vision within the Commission's mandates and authorities.

Unique Challenges (Question 1)

The following is a synopsis of the perspectives shared by fishing community members about the unique challenges facing their communities. The answers to the questions were used to draw general themes as seen across the state; specific responses and regionally-specific perspectives regarding unique challenges to each port are found in Appendix A.

- **Fisheries Management Changes and Access**

A repeated theme was "lack of access", whether this referred to availability of fishing grounds, adequate harvest levels, permits, or cost of permits. While these themes are explored further below, many challenges were attributed to the State's policy on restricting access. The main challenge that was presented is limitations on access to existing fisheries due to current fishing access and permit structures and constraints under the Commission's restricted access policy. This policy created a limited entry structure of specific fisheries and fisheries management decisions that have eroded flexibility within communities. This has occurred by reducing participation, prioritizing large operations, and allowing privately owned permits for a public resource. Meeting participants understood that in 1999, when the restricted access policy was adopted,

many of California's fisheries were overcapitalized and both ecologically and economically unsustainable as vessels became larger and faster, greatly increased fishing power and hold capacity, and used a wide variety of electronic innovations to find and catch fish. Simultaneously, fishermen increased knowledge of the behavior of target species within their trade. The goal of the restricted access policy was to address a fishery management problem and implement an effective solution to restrict fishing effort so that the "race for fish" ended. However, conditions have changed substantially in the past 20 years and, as of a result of state policy, coupled with federal fisheries management responses, fishing fleets in many port areas have greatly decreased and subsequently port infrastructure has declined. A change in policy could lead to adaptation of current management strategies and thus coastal fishermen have prioritized fisheries access policy as the highest concern for sustaining fishing communities.

- **Changing Climate and Ocean Conditions, and Environmental Impacts on Fisheries**

Varying environmental conditions have had both individual and cumulative on fisheries and coastal communities, particularly associated with climate change and changing ocean conditions. Marine heat waves; species distribution shifts; increased interactions with protected species; increased frequency and severity of storms; kelp forest ecosystem imbalance resulting from multiple stressors; ocean acidification; sea level rise; reduced productivity of spawning and rearing waters and biogenic habitat; and biotoxins and harmful algal blooms, have been detrimental to several fisheries in different ways. Extreme ocean events have occurred at an unprecedented magnitude and frequency. Participants shared their experience about unique impacts fishing communities will endure as productivity, health, and distribution of target marine species change, affecting their economic livelihoods. These events and associated uncertainty have served to expose challenges in adapting under the current management structure.

- **Loss of Historic Fisheries**

Fishing communities are still experiencing the impact of the loss of historic fisheries that occurred due factors such as decreased fish stocks and constraints to fishing seasons (e.g., salmon), catch levels (nearshore), or available fishing grounds (rockfish conservation areas) to support stock rebuilding plans. Implementation of "fisheries rationalization" and capacity reduction plans such as federal groundfish trawl individual transferable quotas (ITQs), and implementing state restricted access programs in California with new qualification criteria for "initial permit issuance" met its goals but had some unintended consequences: loss of locally-held catch quota or previously-held permits, shrinking of fishing portfolios, loss of small scale open access options and other constrained opportunities for accessing existing fisheries or developing new fishery opportunities.

- **Flexibility to Tailor Fishing Opportunities to Port-Specific Conditions**

A clear message across the meetings was that communities are seeking opportunities to adapt fishing to current conditions in their ports. In some areas, the loss of infrastructure previously associated with large volume fisheries means that communities need to adapt to smaller volume-based fishing operations compatible

with remaining infrastructure, including storage and ice facilities. Small fishing communities reported that they have a difficult time advocating for their access needs and competing with higher-value fishing organizations that can pay for professional fishery advocates. With climate change, fishermen see opportunities for “pop-up fisheries” for potentially ephemeral but now-locally-available fish. Community members emphasized the importance of managers recognizing that fishing opportunities for a port can change markedly and advocated for collaborative development from the bottom up with fishermen, processors, agency representatives, and researchers to tailor fishing opportunities when different opportunities for new access arises.

- *Deteriorating Infrastructure*

Since variable catches are not consistent enough to retain infrastructure, port infrastructures are deteriorating. Many fishermen have expressed frustrations about the lack of resources or facilities to accomplish their work. Many ports are losing docks, ice machines, storage, and fuel facilities. There were overwhelming requests for actions that would enhance infrastructure to save fishing communities.

- *Retaining Local Markets*

Fishing communities are faced with the challenge of retaining local markets for fish products since they experience competition with non-California product importations. Sometimes after a fishery closure, markets may fill the product gap with imported product and they do not tolerate variable catch. There is an increased demand for buying local fish, yet fishermen have limited access and struggle to meet the demand.

- *Complex Regulations (both State and Federal)*

Many fishermen experience difficulty with the existing management structure complexity and in deciphering regulations. There are different regulations for nearshore versus offshore, it is challenging to interpolate legal boundaries, and party boats have to know and understand regulations for all species. Many fishermen have also expressed the lack of simple information clearing houses and the struggle of complying with demands of federal regulation.

- *Permit Availability and Costs*

Due to the restricted access policy, there are permit transferability constraints and/or high costs to purchase permits. If permits are available, most are sold on the open market and are significantly more expensive. Furthermore, permits are often designed for higher vessel capacity instead of small scale opportunities.

- *Recruitment of New/Young Fishermen*

Due to the high cost of entry into the fishery, there is a shrinking fleet and lack of young fishermen entrants. With a limited career trajectory for young fishermen, there may not be enough fishermen in the future to keep commercial fisheries running and jeopardize food security. Furthermore, cultural knowledge within fisheries will be lost with the retirement of older fishermen.

- *Data Gaps in Fishery Management*

There are currently data gaps in fishery management that prohibit new management decisions to be made. Fishermen are frustrated with the current stock assessment process. As a result of this issue, fishermen want to use their wealth of knowledge and engage in filling the research gap by collecting the necessary data to contribute to more effective management decisions.

- *Competing Uses*

Fishing communities are threatened by a variety of alternative competing uses. These include spatial uses in ocean waters overlapping with fishing grounds including potential aquaculture farms, alternative energy facilities such as offshore wind farms, and desalination plants. There is also competition for onshore space utilization associated with gentrification including repurposing commercial fishing docks for yachts and pleasure boats, conversion of storage warehouses into breweries or restaurants, etc. Competing uses often generate higher income than commercial fish landings; ports that have maintained commercial fishing facilities and docks have often done so through intentionally planning and prioritization of the non-monetary value of fishing to their community and maintaining its cultural heritage, while in other ports the fishing industry is seeking ways to champion that purpose.

Current Adaptation Strategies (Question 2)

A number of the key concerns highlighted during the group discussions associated with changing conditions and constraints on creative adaptation. Participants were specifically asked how they adapt when the key fisheries in which they engage are no viable or are closed. Responses included:

- Shifting geographic location from local communities based on seasons or resource availability (home port vs. away ports)
- Redirecting focus from primary fisheries to secondary or different fisheries (e.g., fishermen turned to squid and sablefish in Half Moon Bay during salmon crash)
- Seek jobs outside of fishing
- Charter sport fishing boats: Switch to ecotourism and whale watching expeditions

Future Vision (Question 3)

Participants were asked to describe not only what changes they have seen in and around their ports over the past 20 years, but also what they envision for their ports to be like 20 years from now. Responses included:

- Prioritization and support for fisheries from harbors and ports in the form of: offloading resources; local markets; reserved storage space for fishing boats and equipment; rebuilt waterfront infrastructure to support fishing activities
- Streamlined permitting process, with more regionally-focused permit structures
- Permit fishing for multiple species at different scales of operation

- Community co-ops, where fishermen agree to sell all landed catch to one place and profits are split amongst fishers who participate in the co-op
- Recreational and commercial fisherman participation in tagging/collecting data (sampling)
- Fishermen included in marine protected area collaboratives
- Increased education of commercial fishing
- Flexibility in fisheries management
- Lower license costs
- Electronic representations of the current fishing regulations at each port
- Modernization of facilities

Potential Commission Actions (Question 4)

Finally, participants were asked what policies or regulation changes they would like to see the Commission develop to help adapt to uncertain conditions and meet future goals for their ports. Responses included:

- Re-evaluate how FGC approaches restricting access to fisheries - open small-scale and community based fishing access
- Adopt a fisheries policy that states that the Commission supports a future with California commercial fisheries and will consider needs fishing communities in its decision-making
- Grant new fishing permits in existing fisheries (e.g., squid, pink shrimp) or open new fisheries opportunities (e.g., box crab, octopus) to expand long-term fishing opportunities
- Encourage young fishermen/new entrants to join fishing communities. Ideas shared included:
 - Adopt an apprenticeship program
 - Create incentives for participation
 - Establish a lower cost “apprentice” or “entry level” commercial fishing permit with a lower fee and opportunities to learn and leverage resources from experienced fishermen
 - Promote pier fishing to bring young fishermen into the industry
- Permit transferability. Ideas shared included:
 - Redistribute retired permits to other fishers, family members, and/or apprentices (young fishermen/new entrants)
 - Make permits more easily transferrable within an apprenticeship program (e.g., no fee, lower fees)
 - Create community permit banks to purchase permits
- Allow twelve-month sport fishing licences from the date of purchase
- Develop a fishing community sustainability plan at state level

- Recommend that the California Department of Fish and Wildlife (CDFW) conduct stock assessments for all fished species
- Re-examine historical policies and their impacts on coastal fishing communities
- Implement adaptive management in the Marine Life Protection Act (MLPA)
- Implement artificial reefs to provide more fish habitat and fishing opportunities
- Increase stability and local control by tying permits to ports or restricting permit transfers to in-state or regional area (re: groundfish trawl ITQ)
- Engage more directly in PFMC meetings either via coordination/input to CDFW representatives, or directly
- Employ fishermen to collect data to fill information gaps and enhance management and opportunity
- Adopt a principle on not importing seafood

Staff Recommendations: Initial Concepts for Potential Development

Input from fishing communities of potential supportive actions generally fell into fisheries management/regulatory actions (“Management”), changes to existing policies (“Policy”), or actions outside of Commission policy and regulation (i.e., “Other”). Staff recommends that MRC consider recommending to the Commission a broad range of options, both within the Commission’s policy and regulatory authority, as well as considering how to extend beyond these core functions into other areas of influence. The initial list of potential actions highlights possible areas of focus, which can be used to evaluate and prioritize what the Commission will choose to address following public input and feedback.

1. *Develop and adopt a policy on coastal fishing communities:* Consider developing a new policy related to coastal fishing communities for Commission adoption.
2. *Review the Commission’s policy on restricted access commercial fisheries:* Review how the policy has been applied since it was adopted in 1999 – where it was applied (or not) to specific fisheries, how the policy performed at meeting the fishery objectives, unintended consequences in fishing communities, and whether any objectives have changed that warrant possible changes to the policy. This complex policy includes 21 individual sub-policies across 9 unique topic areas.
3. *Identify specific projects to test new approaches:* Work with stakeholders and partners to develop small-scale projects to test new approaches or departures from the restricted access policy. Consider small-scale fishing opportunities in particular, designed to fill information gaps.
4. *Engage legislative staff to pursue adjustments to laws as ideas are refined, through vehicles such as the current fisheries omnibus bill.*
5. *Direct staff to increase engagement and coordination with sister agencies on management decisions affecting California:* Include PFMC, CDFW staff representing California interests at PFMC, California Coastal Commission, etc.
6. *Explore/research possible community-based adaptable fishery structures (e.g., community permit banks or risk pools):* Explore options for community-organized

structures that provide for adaptable responses within the community and could include co-management responsibilities. Consult with partner organizations and possibly convene an experts' workshop; this may require legislative or regulatory frameworks to accommodate such avenues.

7. *Explore filling data needs through collaborative research and data collection:* Work with CDFW on identifying data gaps and possible scientific information that could be gathered through collaborative research or experimental fishing between partner entities and fishermen.
8. *Survey communities, commercial and recreational fishers, and processors about their priorities for Commission focus.*

For all of these potential actions, and any others identified by MRC or the Commission, staff will need to develop a work plan to clarify goals/objectives and identify specific next steps. Staff recommends that a more detailed discussion about the initial concepts for potential development, and potential recommendations to the Commission, be held at MRC's November 14, 2018 meeting in Sacramento.

APPENDIX A: Common General and Port-Specific Challenges

Common General Challenges

- Loss of access to historical fishing grounds, beach, and piers
- Restricted access
 - Limited access to local resources
 - Existing permit structure within state managed fisheries (permits are often for large-scale operations)
 - Results in transient existence of fleets and fishermen
 - Fishery and area closures
 - No access to areas where species have recovered
 - Cannot compete with imported fish sold at lower prices
 - Limited market and economic value
 - Demand for buying local is high
 - Decreased profitability with increased fish taxes
 - Decreased food system viability
 - Seasonal closures limiting access to markets
 - Increased fishing fees reduces fishing opportunities
- Limited career trajectory for young fishermen
 - Shrinking fleet and lack of young fishermen entrants
 - High cost of entry
 - Cultural knowledge lost with the retirement of older fishermen
 - Not enough fishermen to feed people (food security)
- Deteriorating infrastructures
 - Loss of docks, ice machines, storage, and fuel facilities
 - Variable catches aren't consistent enough to retain infrastructure
- Environmental impacts
 - Climate change (e.g., species distribution shifts, marine heat waves, loss of biogenic habitat)
 - Coastal erosion
 - Diseases and human health risks (e.g., harmful algal blooms)
 - Drought
- Permit transferability constraints and/or costs to purchase
- Difficulty in deciphering regulations
 - Different regulations for nearshore versus offshore
 - Lack of simple information clearing houses
 - Difficult to interpolate legal boundaries
 - Conflicting regulations between federal and state laws (e.g., for shark fin ban)

- Data gaps in fisheries management
 - Stock assessment process needs revision for all fished species
 - Lack of data
- Competing uses
 - Marine spatial planning initiatives (e.g., aquaculture impacts on port dynamics, offshore wind energy)
 - Competition with onshore businesses (e.g., restaurants)

Port-Specific Challenges

North Coast

- General:
 - Problems related to reallocation of federal groundfish individual transferable quota (ITQs) to outside of California
 - Competition with Oregon for processing capabilities and market
 - Small communities have a difficult time advocating for their access needs
 - e.g., FGC denying requests that fishermen believe are available, such as issuance of experimental squid permits or new pink shrimp permits)
 - Restrictions on nearshore fishing due to Pacific Fishery Management Council (PFMC) limits
- Smith River:
 - No credit for closures of yelloweye rockfish (constrains all other groundfish catch)

Central Coast

- Half Moon Bay:
 - Fishing is concentrated in nearshore areas and no access to deep reef
 - Need regulation for tier allocation (e.g., crab and salmon)
 - Layout of rockfish conservation areas are arbitrary and difficult to decipher
 - Limited access to chilipepper rockfish since a special permit is required
- Monterey:
 - Over-regulation of groundfish and fishing grounds constrained by rockfish conservation areas
 - Loss of California halibut trawl grounds in Monterey Bay waters
- San Luis Obispo:
 - Trident Winds' proposal for offshore wind energy development project
 - Potential impact on fishable area
 - Fishing between windmills is a safety issue
 - Impact of wind energy cables on fishing

South Coast

- General:
 - Increase in marine mammal populations (e.g., sea lions, otters)
- Santa Barbara:
 - Moratorium on abalone fishing. Still being impacted by closure of commercial

abalone fishery.

- Ventura:
 - Redevelopment process that reduces commercial and recreational fishery access to the harbor
 - Difficulty in determining legal sheephead size when lengths shrink after being filleted
 - Sea cucumber trawl fishing needs a time limit
 - Increased harbor business costs
 - Lack of money to dredge harbor mouth
 - Lack of lingcod data for management decisions
- San Diego:
 - Lost fishing access due to Shelter Island ramp construction
 - Tijuana River sewage spills polluting fishery
 - Transboundary issue
 - Difficulty in importation process from Mexico due to recreational fishing possession regulation in California
 - Need to expand hatchery program to include halibut and yellowtail

Appendix B: Fishing Community Profiles for Select Ports

The following pages include profiles of commercial and some recreational fisheries for recent years in the following port areas:

- Fort Bragg
- Bodega Bay
- San Francisco
- Half Moon Bay
- Morro Bay Area
- Santa Barbara Channel Area

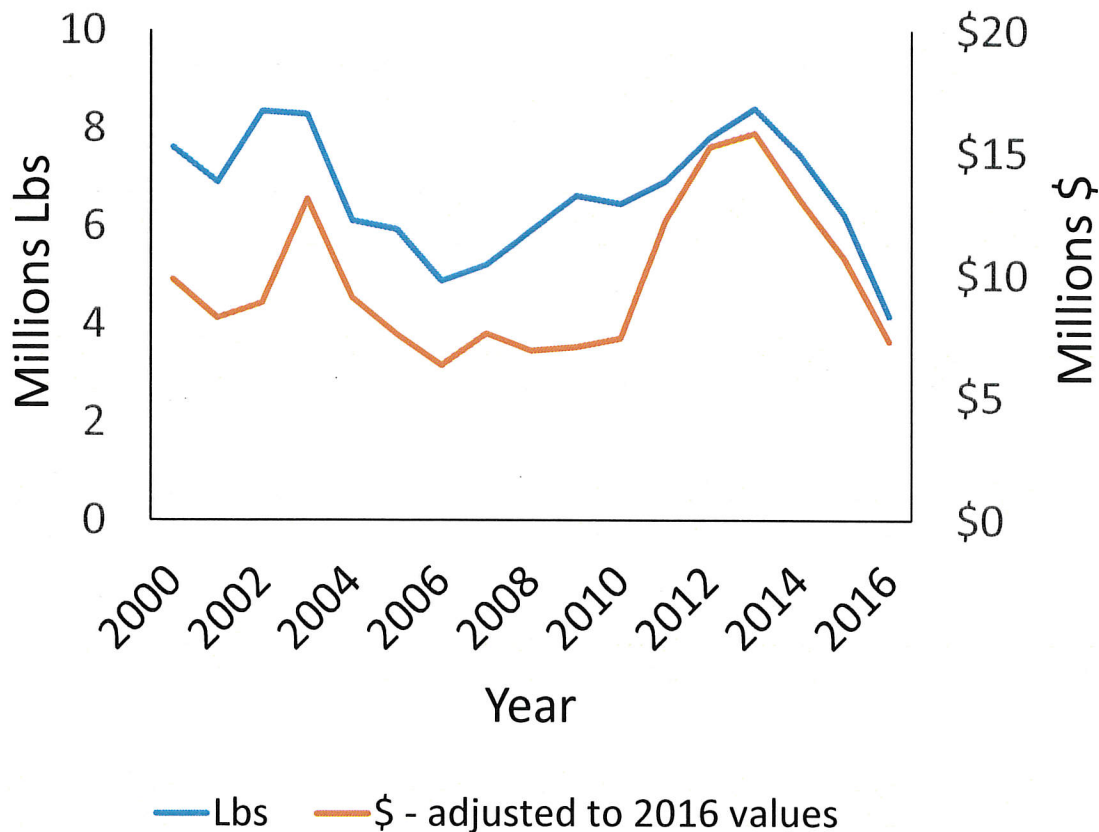
Fort Bragg FISHING COMMUNITY PROFILE

~7 million lbs
average
annual
landings

246
Commercial
Fishing
Vessels

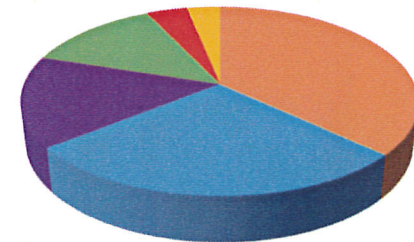
8 Commercial
Passenger
Fishing Vessels
(8 year average)

TOTAL COMMERCIAL LANDINGS AND VALUE: 2000-2016



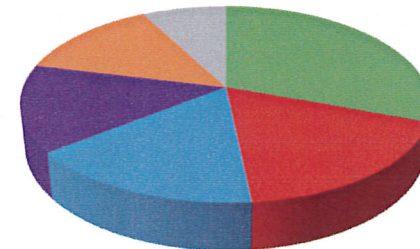
TOP 6 SPECIES BY VALUE (\$)

5 Year Average: 2012-2016



TOP 6 SPECIES BY WEIGHT (LBS)

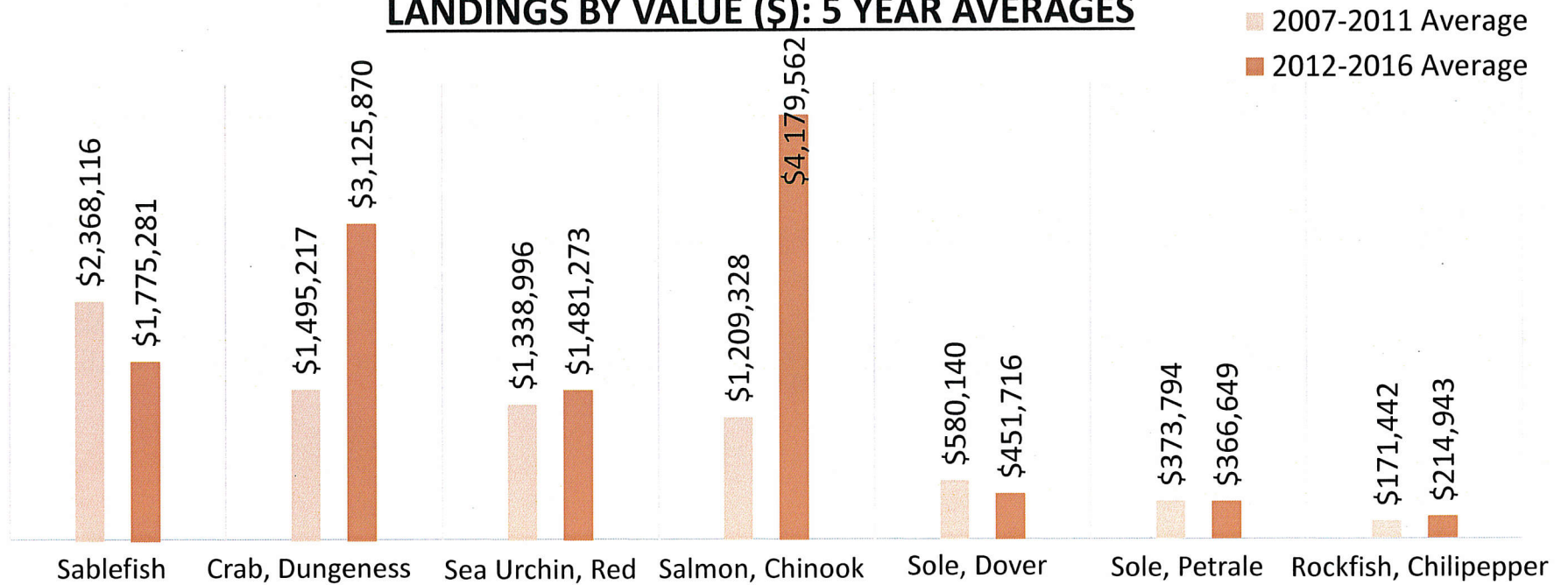
5 Year Average: 2012-2016



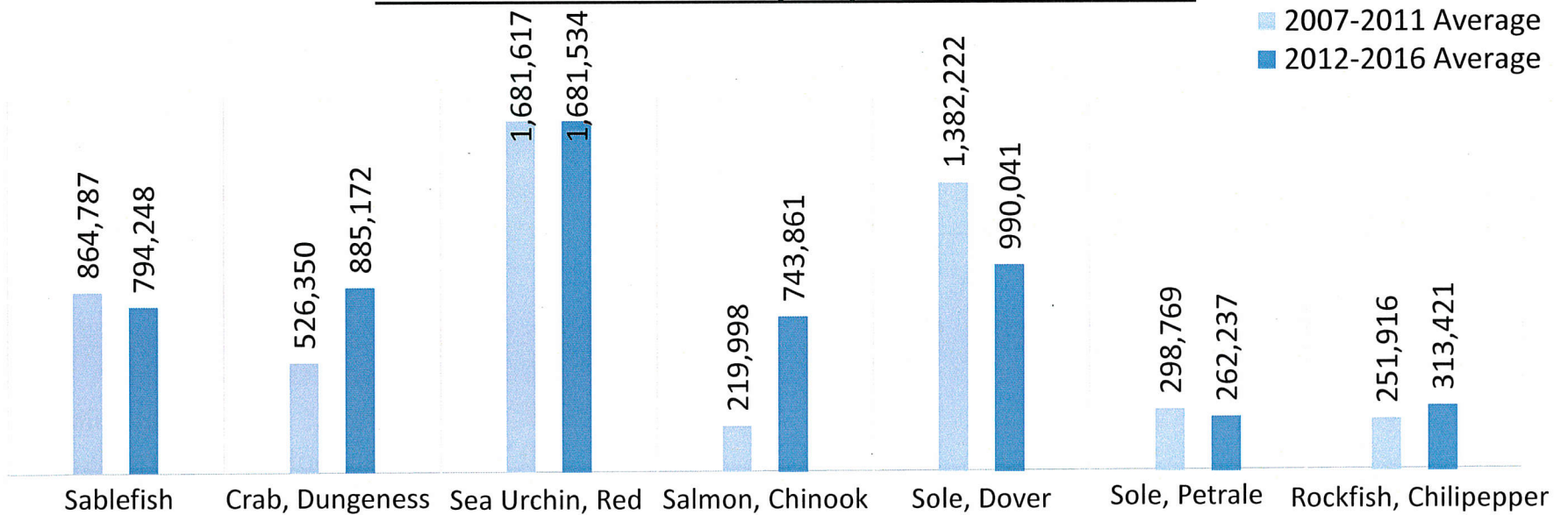
- | | |
|-----------------|-----------------------|
| Crab, Dungeness | Sablefish |
| Sole, Dover | Sea urchin, red |
| Salmon, Chinook | Thornyhead, longspine |
| Sole, Petrale | |

COMMERCIAL LANDINGS OF SELECT SPECIES IN 2007-2011 VS 2012-2016

LANDINGS BY VALUE (\$): 5 YEAR AVERAGES



LANDINGS BY WEIGHT (LBS): 5 YEAR AVERAGES



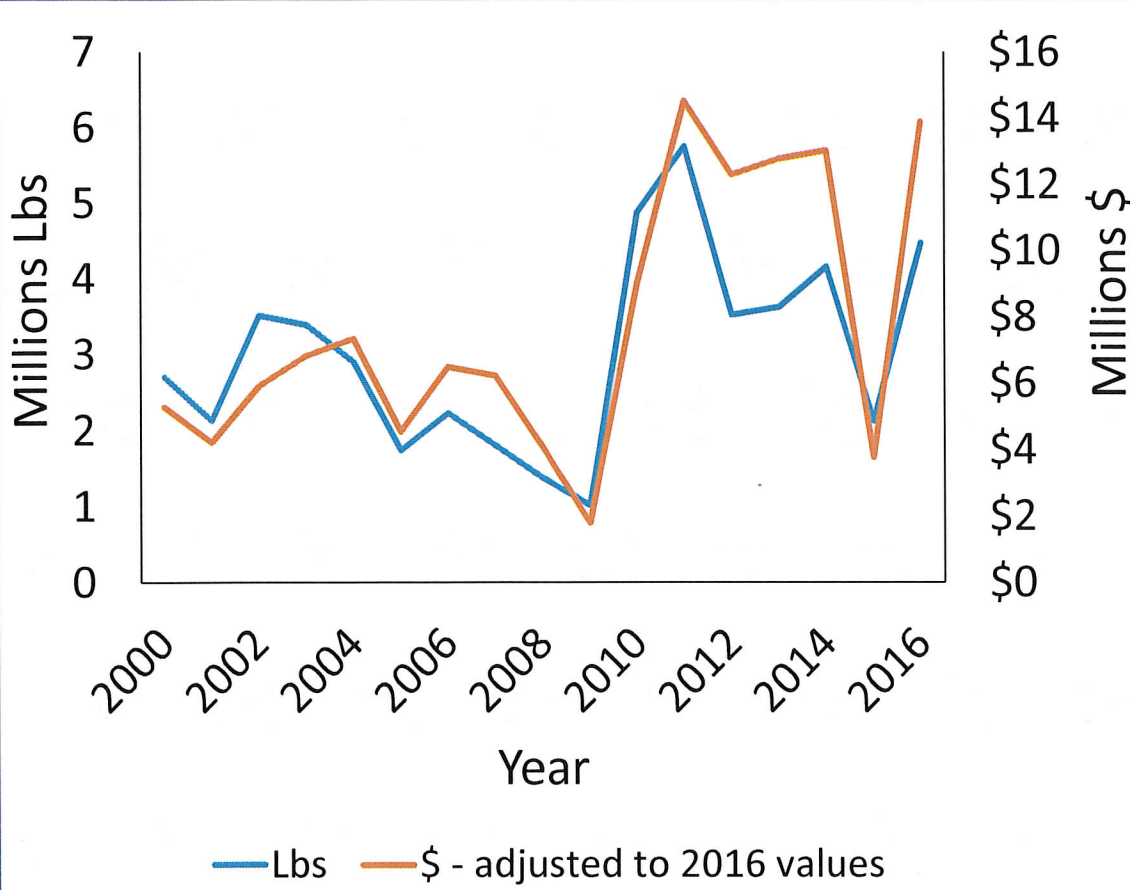
Bodega Bay FISHING COMMUNITY PROFILE

~3 million lbs
average
annual
landings

257
Commercial
Fishing
Vessels

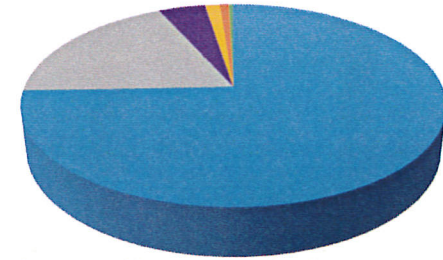
12 Commercial
Passenger
Fishing Vessels
(8 year average)

TOTAL COMMERCIAL LANDINGS AND VALUE: 2000-2016



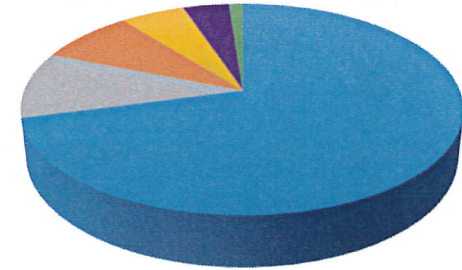
TOP 6 SPECIES BY VALUE (\$)

5 Year Average: 2012-2016



TOP 6 SPECIES BY WEIGHT (LBS)

5 Year Average: 2012-2016

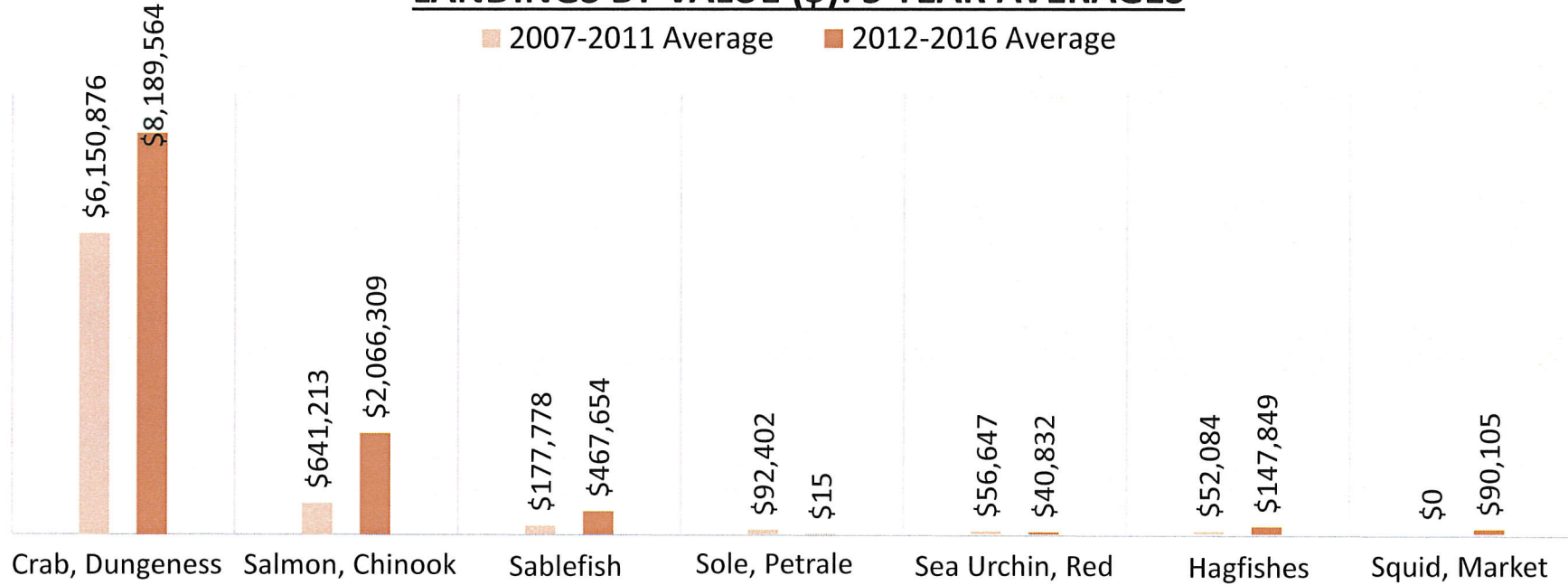


- Crab, Dungeness
- Squid, market
- Salmon, Chinook
- Hagfishes
- Sablefish
- Sea urchin, red

COMMERCIAL LANDINGS OF SELECT SPECIES IN 2007-2011 VS 2012-2016

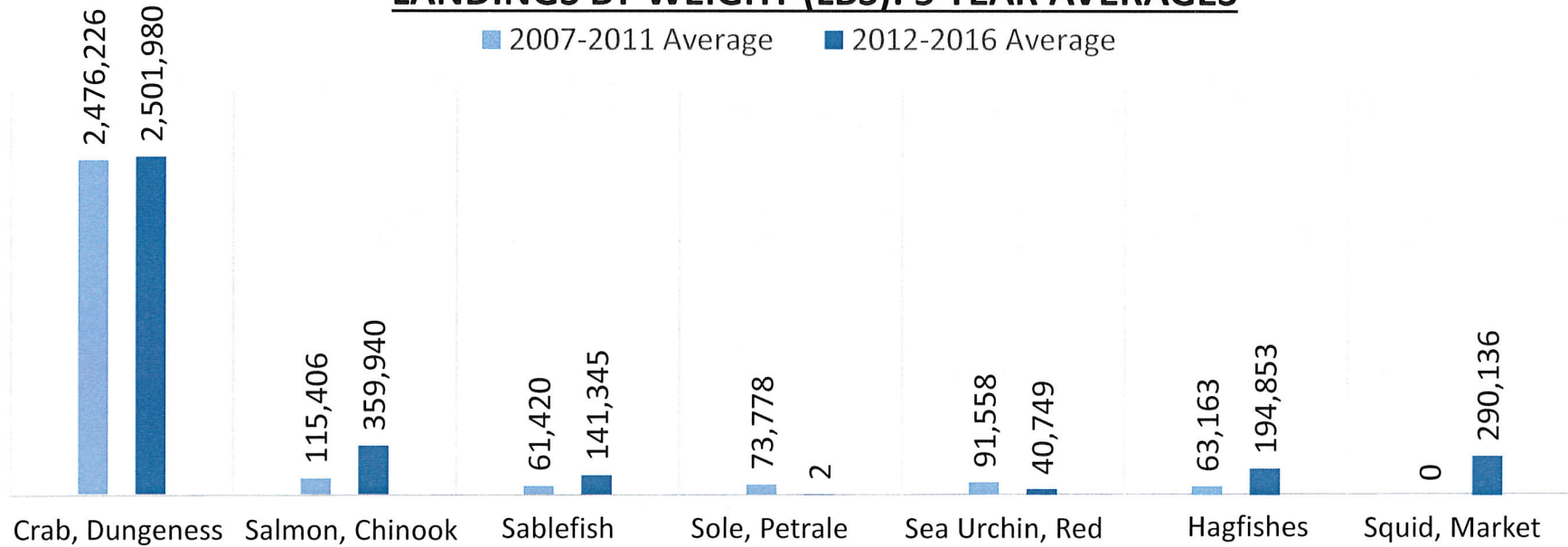
LANDINGS BY VALUE (\$): 5 YEAR AVERAGES

■ 2007-2011 Average ■ 2012-2016 Average



LANDINGS BY WEIGHT (LBS): 5 YEAR AVERAGES

■ 2007-2011 Average ■ 2012-2016 Average



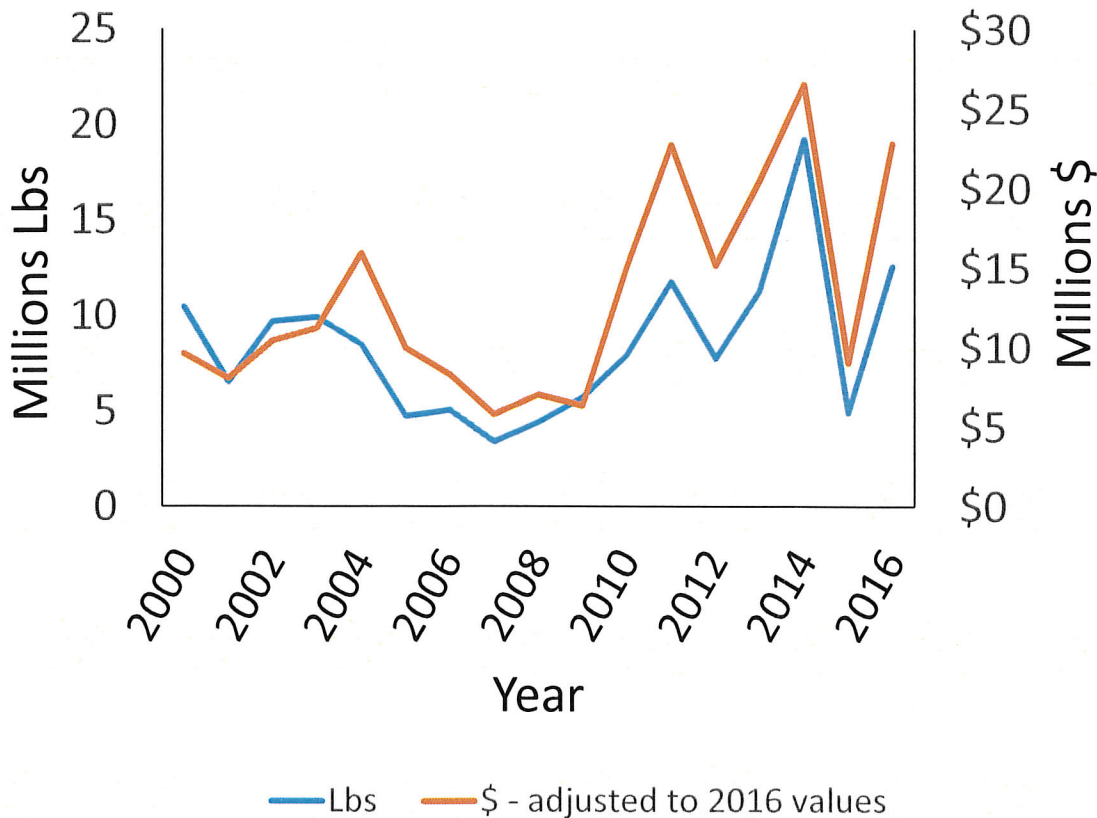
San Francisco FISHING COMMUNITY PROFILE

421 Commercial Fishing Vessels

15 Seafood Processors

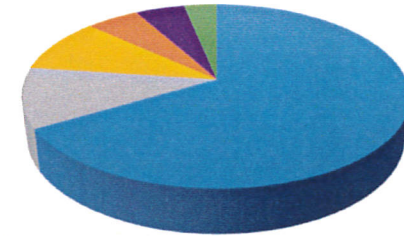
32 Commercial Passenger Fishing Vessels (8 year average)

TOTAL COMMERCIAL LANDINGS AND VALUE: 2000-2016



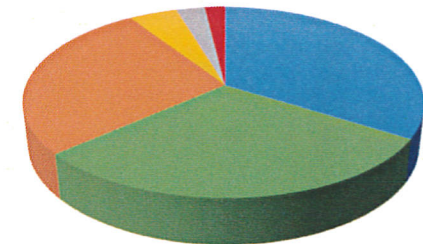
TOP 6 SPECIES BY VALUE (\$)

5 Year Average: 2012-2016



TOP 6 SPECIES BY WEIGHT (LBS)

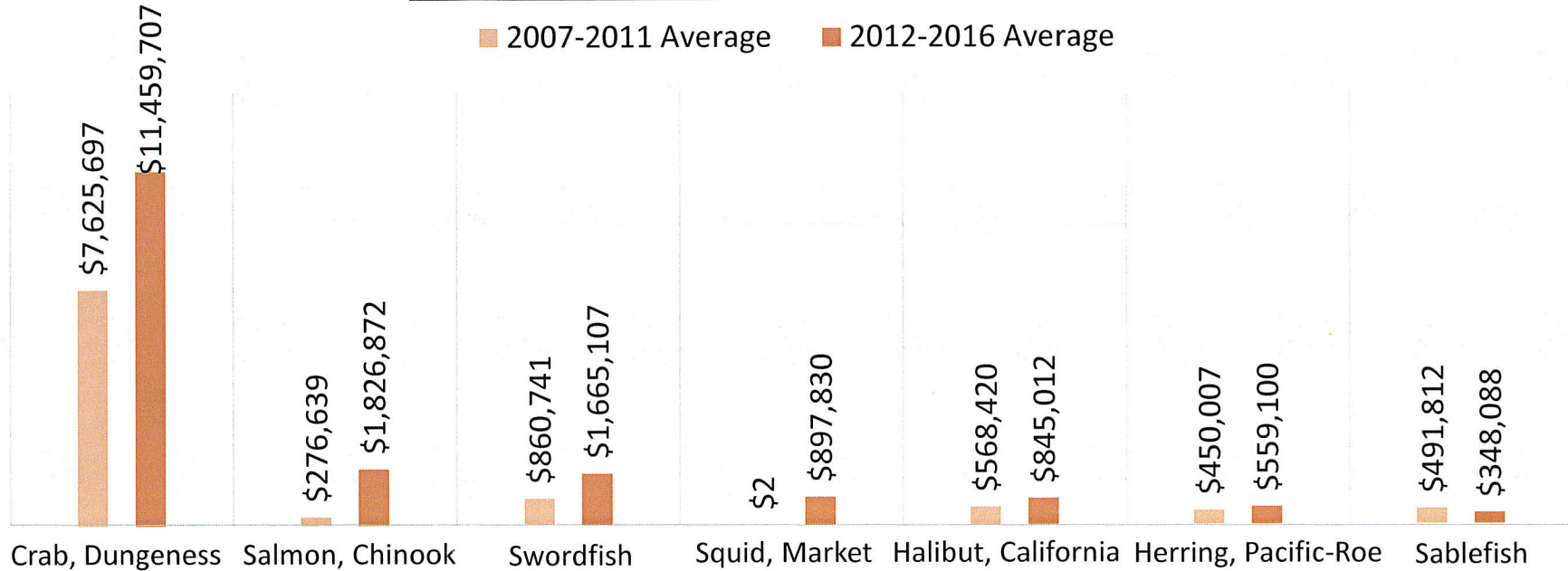
5 Year Average: 2012-2016



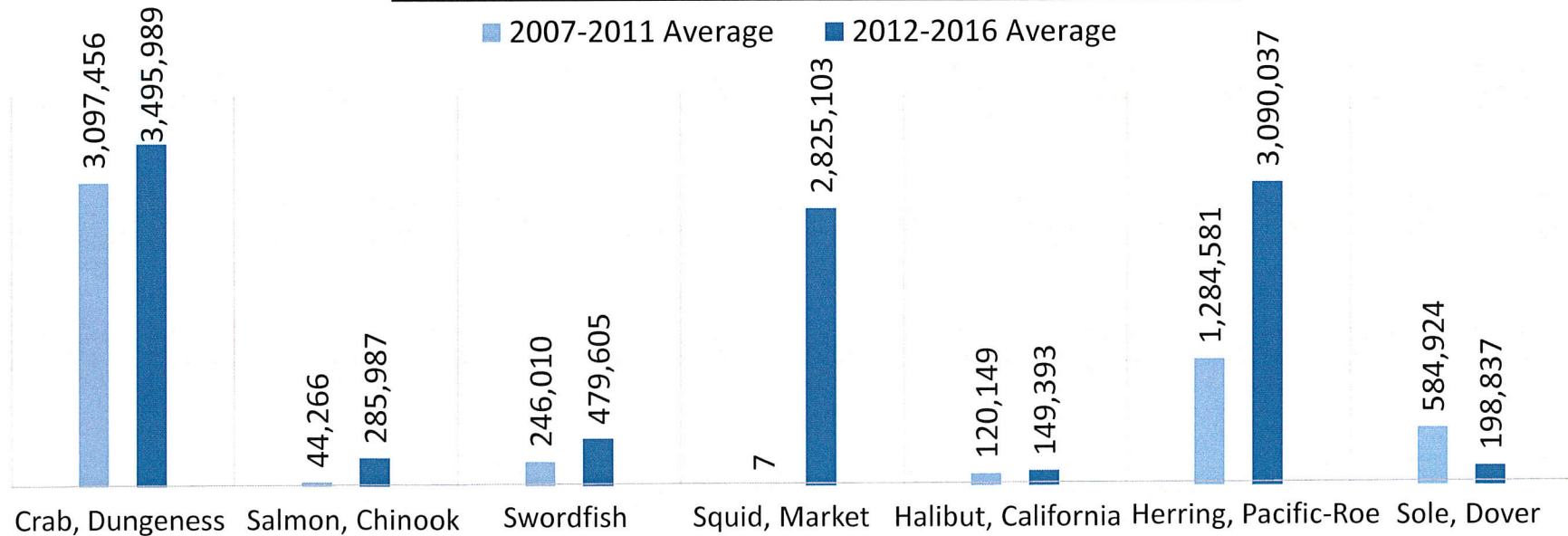
- | | |
|-----------------|----------------------|
| Crab, Dungeness | Halibut, California |
| Squid, market | Sole, Dover |
| Salmon, Chinook | Herring, Pacific-Roe |
| Swordfish | |

COMMERCIAL LANDINGS OF SELECT SPECIES IN 2007-2011 VS 2012-2016

LANDINGS BY VALUE (\$): 5 YEAR AVERAGES



LANDINGS BY WEIGHT (LBS): 5 YEAR AVERAGES



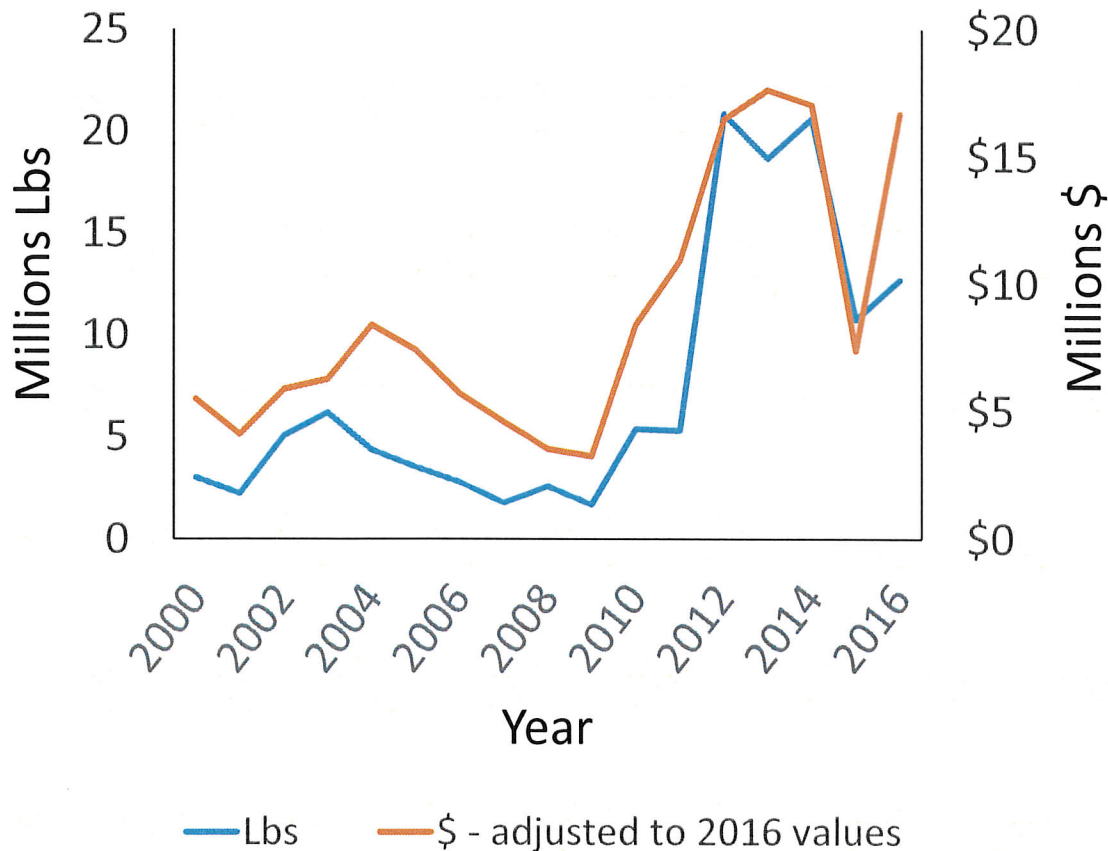
Half Moon Bay FISHING COMMUNITY PROFILE

~8 million lbs
average
annual
landings

162
Commercial
Fishing
Vessels

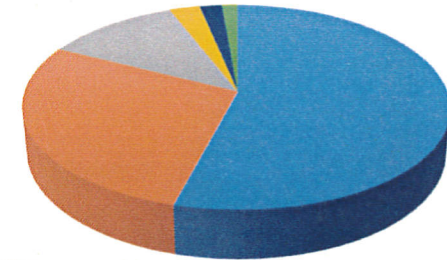
8 Commercial
Passenger
Fishing Vessels
(7 year average)

TOTAL COMMERCIAL LANDINGS AND VALUE: 2000-2016



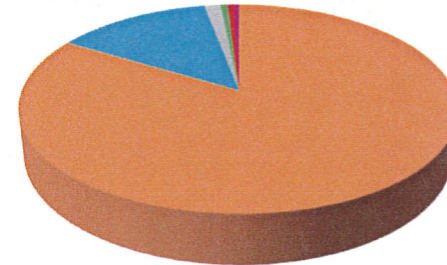
TOP 6 SPECIES BY VALUE (\$)

5 Year Average: 2012-2016



TOP 6 SPECIES BY WEIGHT (LBS)

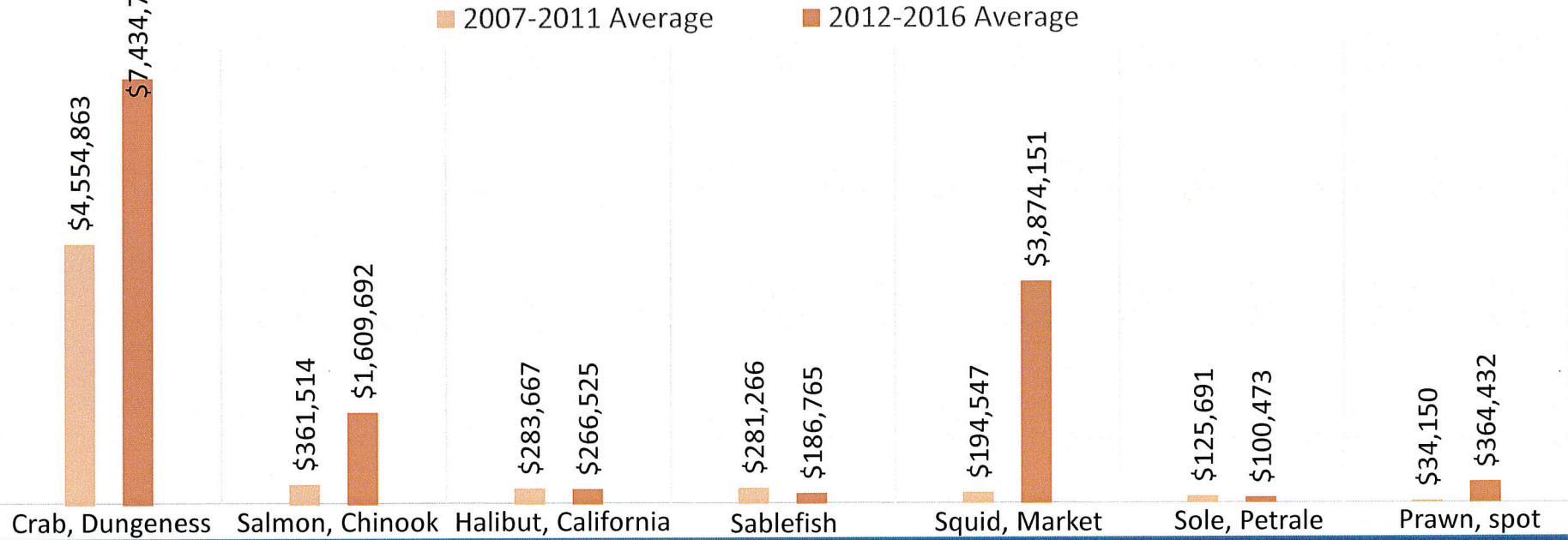
5 Year Average: 2012-2016



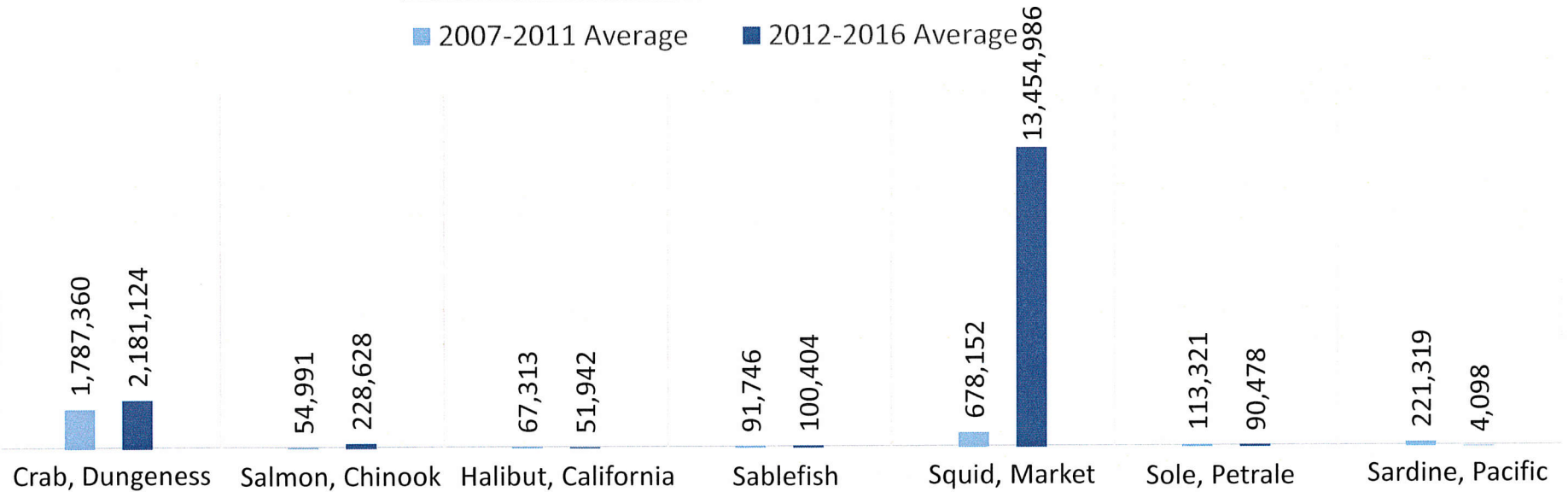
- | | |
|-----------------|---------------------|
| Crab, Dungeness | Halibut, California |
| Squid, market | Sanddab |
| Salmon, Chinook | Sole, petrale |
| Prawn, spot | Sablefish |

COMMERCIAL LANDINGS OF SELECT SPECIES IN 2007-2011 VS 2012-2016

LANDINGS BY VALUE (\$): 5 YEAR AVERAGES



LANDINGS BY WEIGHT (LBS): 5 YEAR AVERAGES



MORRO BAY AREA FISHING COMMUNITY PROFILE

Includes Morro Bay, Avila/Port San Luis,
and San Simeon

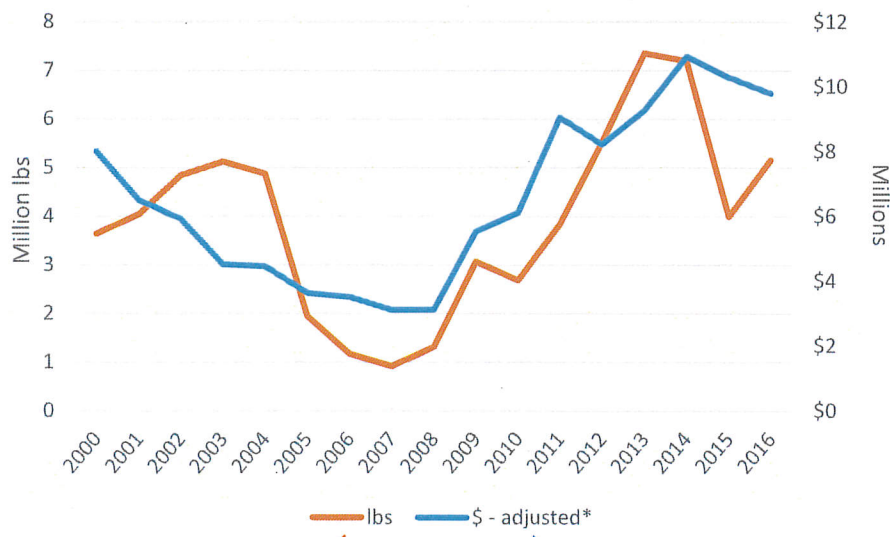
50-60
Commercial
Fishing
Vessels

8 Charter
Fishing
Vessels

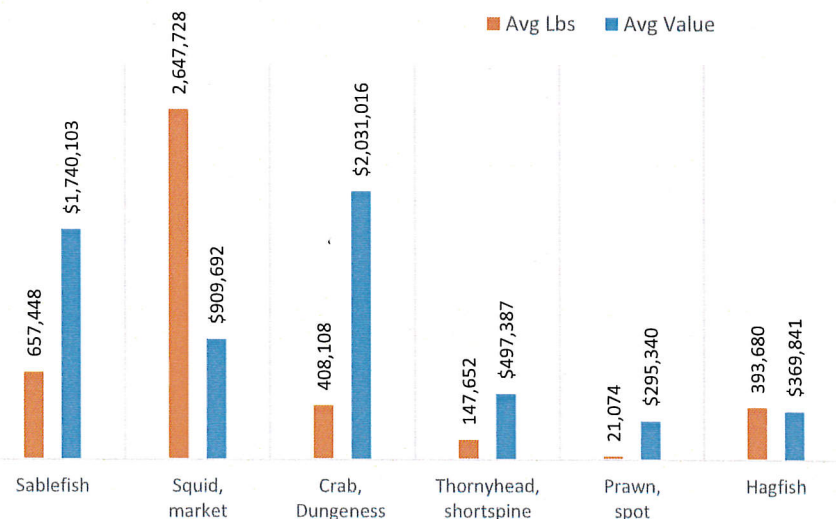
2 Seafood
Processors

~4.3 million
lbs landed
annually
(avg)

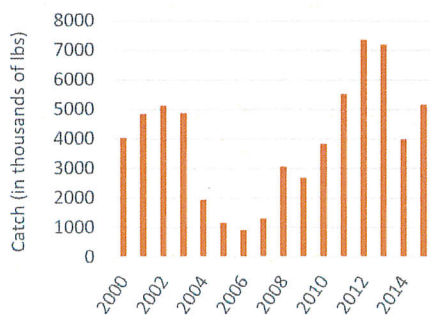
Morro Bay Area Total Catch and Value since 2000



Catch & Value of Top 6 Species (5 yr avg)



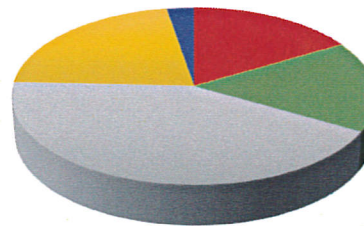
Catch Since 2000 (lbs)



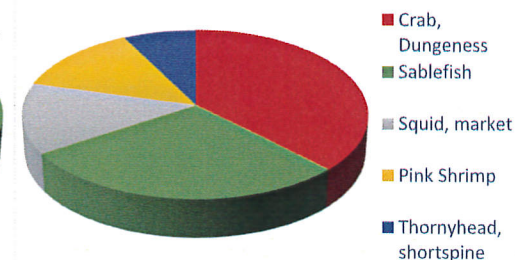
Value of Catch Since 2000 (\$)



2016 Top 5 Species - Lbs



2016 Top 5 Species - \$



*All dollar amounts adjusted to 2016 values

Santa Barbara Channel Area Fishing Community Profile

Includes Santa Barbara, Ventura, Channel Islands (Oxnard), Port Hueneme, Gaviota Beach, Guadalupe Beach ports

150-200 Commercial Fishing Vessels

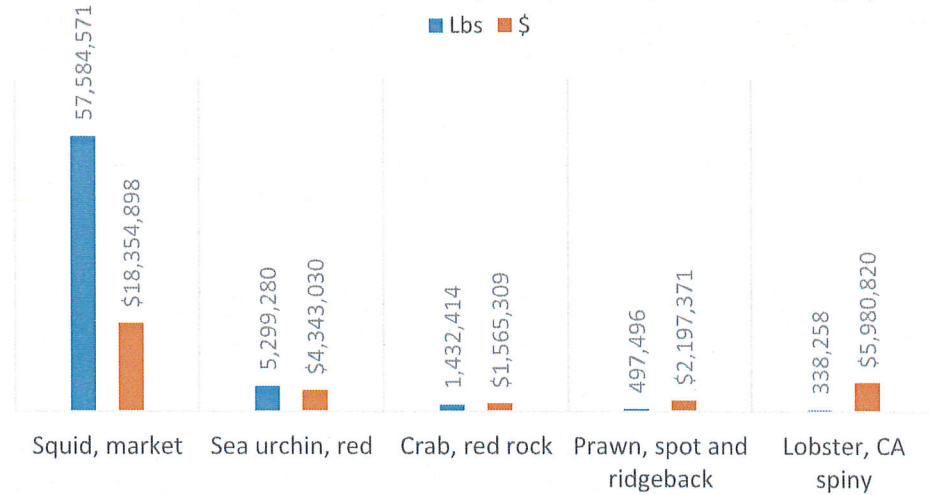
\$33 million average annual earnings

~90 million lbs average annual landings

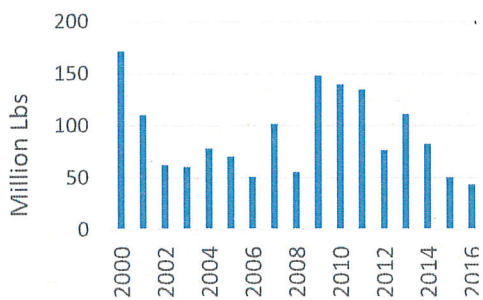
Santa Barbara Channel Area Total Catch and Value 2000-2016



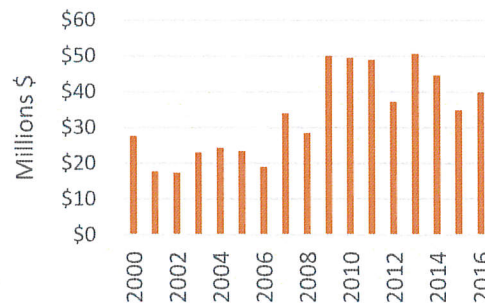
Catch and Value Of Top 6 Species (5 Year Average)



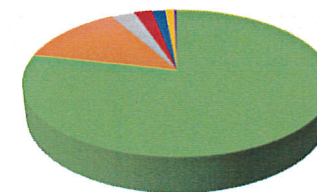
Catch Since 2000 (lbs)



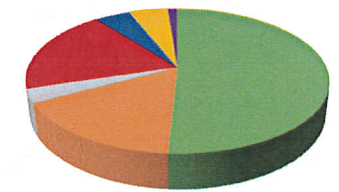
Value of Catch Since 2000 (\$)



2016 Top 7 by Weight



2016 Top 7 by Value



- Squid, market
- Crab, red rock
- Prawn, ridgeback
- Halibut

- Sea urchin, red
- Mackerel, Pacific
- Lobster, California spiny

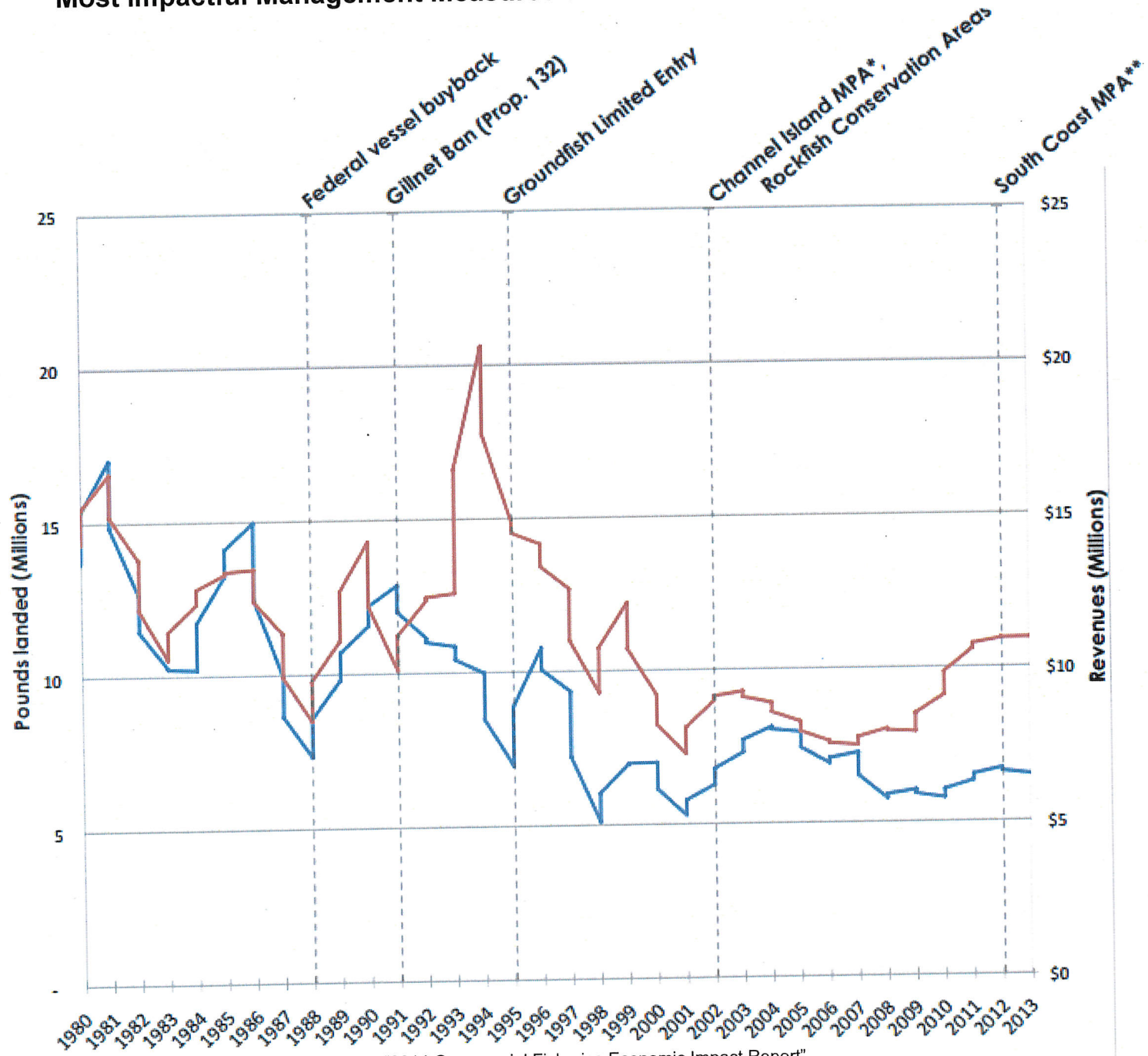
Management Context for Select Fisheries in the Santa Barbara Channel Port Area¹

Fishery	Management Authority		Management Measures				
	State	Federal	Limited entry	Quotas	Time/area closures	Species size/sex rules	Gear restrictions
Blackcod (sablefish) hook-and-line, trap	✓	✓	✓	✓	✓	✓	✓
Coastal pelagic finfish seine	✓	✓	✓	✓	✓		✓
Market squid seine	✓		✓	✓	✓		✓
Red sea urchin dive	✓		✓		✓	✓	✓
Rock crab trap	✓		✓			✓	✓
Sea cucumber dive, trawl	✓		✓		✓		✓
Spiny lobster trap	✓		✓		✓	✓	✓
Spot prawn trap	✓		✓		✓		✓

Note: Management authority and /or measures may vary for a given fishery depending on species and/or gear type.

¹ Credit: California Sea Grant (<https://caseagrants.ucsd.edu/project/discover-california-commercial-fisheries/regions/santa-barbara-channel>)

Most Impactful Management Measures and Their Effects on the Industry



Credit: Lisa Wise Consulting, CFSB "2014 Commercial Fisheries Economic Impact Report"

COMMITTEE STAFF SUMMARY FOR NOVEMBER 14, 2018**4. COASTAL FISHING COMMUNITIES PROJECT****Today's Item**Information Direction

Receive staff update and public comments on coastal fishing communities project staff report, and discuss next steps and possible recommendations.

Summary of Previous/Future Actions

- | | |
|--|--------------------------------------|
| • FGC refers topic to MRC | Feb 11, 2015; Sacramento |
| • MRC discussions, planning, and public meetings | 2015 - 2017; various |
| • Most recent MRC update | Jul 17, 2018; MRC, San Clemente |
| • Today's update and next steps | Nov 14, 2018; MRC, Sacramento |

Background

In early 2015, at the direction of FGC, an MRC discussion regarding fishing communities was initiated following a public request for new fishery access opportunities (see Exhibit 1 for background). Following exploratory discussions with MRC and the public in 2015 and 2016 regarding challenges and needs within California's coastal fishing communities, FGC approved an MRC recommendation to broaden the conversation coastwide through a series of locally-focused coastal fishing community meetings along the California coast.

A total of seven community meetings were held in 2017 and 2018 from Crescent City to San Diego. The meetings offered a venue to more thoroughly explore, from the perspective of specific fishing-dependent coastal communities, current conditions and changes being experienced in ports, constraints on adaptation, and needs for creating future resilience.

At the Jul 2018 MRC meeting, staff presented a staff report that summarized input from the various meetings to identify common themes, port-specific issues, and ideas. The staff report also identified a range of options for potential FGC focus and action in response to community concerns.

Update

Based on MRC recommendation, the staff report was opened for the public's feedback on the report and initial concepts from July 17 to September 24, 2018. There were 14 comment emails and letters with over 75 unique comments received during the public comment period (see "significant public comments" below).

In addition to written comments, staff has engaged in multiple conversations with fishing organizations, environmental non-governmental organizations, state and federal agencies, and academics, which are emerging as potential collaborators to support both the goals of FGC as well as those of fishing communities. Today, staff will provide an update on these project activities and opportunities, and discuss options for possible next steps.

COMMITTEE STAFF SUMMARY FOR NOVEMBER 14, 2018

Significant Public Comments

- Fourteen written comments on the staff report were received, providing over 75 individual comments. The comments provide valuable feedback on both the content of the report, by suggesting edits and additions, and the potential recommendations within the report. Comments are summarized in Exhibit 3 and linked to the individual comments.
- Several organizations have offered to support staff in an effort to help enhance and strengthen the report contents, through developing a more thorough report. Recommendations to strengthen content include providing an analysis of potential actions, assess which entities are appropriate to fill the action, identify what other organizations are already doing, and evaluate/recommend those actions in which FGC could invest its limited resources.
- A joint comment letter from five fishery associations and representatives urged MRC to hold off discussing “next steps and possible recommendations” until the Mar 2019 MRC meeting. The goal is to ensure that the extensive public comment, and additional input derived from ongoing discussion with FGC staff members, can progress and be integrated into a more detailed report that will help refine the next steps and possible recommendations (Exhibit 4).

Recommendation

FGC staff: Direct staff to: (1) continue to broaden conversations with state and federal agencies, non-governmental organizations, and fishing organizations, in a broader effort to explore how to best support fishing communities; (2) integrate input from public comments into a more in-depth report, including analysis of options and potential partnerships; and (3) schedule a discussion of the report, next steps and possible recommendations for the Mar 2019 MRC meeting.

Exhibits

1. Staff summary from Nov 4, 2015 MRC meeting (for background purposes only)
2. Staff report on 2017-2018 California coastal community meetings, dated Jul 2018
3. Public comments received on staff report, dated Nov 8, 2018
4. Joint letter from Pacific Coast Federation of Fishermens Associations, California Wetfish Producers Association, West Coast Fisheries Consultants, Alliance of Communities for Sustainable Fisheries, and Commercial Fishermen of Santa Barbara, received Oct 31, 2018

Committee Direction/Recommendation

The Marine Resources Committee recommends that staff take the following next steps based on outcomes and ideas generated through fishing community meetings and public comments on the staff report: _____.

COMMITTEE STAFF SUMMARY FOR NOVEMBER 14, 2018**7. OFFSHORE MARINE AQUACULTURE****Today's Item****Information** **Direction**

Receive DFW overview of a programmatic environmental impact report (PEIR) that will evaluate a proposed regulatory framework governing future offshore marine aquaculture in California.

Summary of Previous/Future Actions

- FGC referral to MRC Apr 18-19, 2018; Ventura
- **Today's overview of PEIR** **Nov 14, 2108; MRC, Sacramento**

Background

FGC has authority to lease state water bottoms for purposes of conducting aquaculture in marine waters of the state (Section 15400 and 15405, Fish and Game Code). Accordingly, shellfish aquaculture and seaweed culture are currently conducted on 17 active leases across the state; currently there is no commercial offshore marine finfish aquaculture practiced in California.

While FGC is authorized to issue leases for finfish aquaculture, the Fish and Game Code prescribes that FGC may not do so until it considers how it will address specific concerns, identified in statute, within a new regulatory framework using the analysis of a PEIR. The statute also directs DFW, in consultation with the Aquaculture Development Committee (established through Fish and Game Code Section 15700), to complete the PEIR for existing and potential commercial aquaculture operations if certain funding conditions are met.

The aquaculture PEIR has been envisioned and worked on periodically over the course of more than 10 years, but there is currently a renewed focus on bringing the analysis to completion. In light of the renewed focus, DFW will provide an update on activities, progress, and status of the PEIR for marine aquaculture; this will include a projected timeline that reflects work accomplished and milestones that lie ahead in the near future.

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

COMMITTEE STAFF SUMMARY FOR JULY 20, 2017

7. STATE WATER BOTTOM LEASES FOR AQUACULTURE

Today's Item

Information

Direction

- (A) Discuss best management practices (BMPs) planning for existing lease areas and scope of future rulemaking
- (B) Discuss planning for and consideration of applications for new leases

Summary of Previous/Future Actions

- (A)
 - Aquaculture leases/debris public meeting Aug 2015; public meeting, Marshall
 - Discussed possible BMPs Feb 10-11, 2016; FGC, Sacramento
 - FGC supported BMP rulemaking approach Jun 22-23, 2016; FGC, Bakersfield
 - MRC discussed aquaculture debris July 21, 2016; MRC, Petaluma
 - Aquaculture lease BMPs public meeting Jul 17, 2017; public meeting, Marshall
 - **Today's update on BMP development Jul 20, 2017; MRC, Santa Rosa**
- (B)
 - FGC referred topic to MRC Jun 21-22, 2017; Smith River
 - **Today's discussion on new leases Jul 20, 2017; MRC, Santa Rosa**

Background

FGC has the authority to lease state water bottoms to any person for the purpose of conducting aquaculture in marine waters of the state under terms agreed upon between FGC and the lessee pursuant to Sections 15400 and 15405, Fish and Game Code. While general regulations governing all aquaculture leases were established in Section 237, Title 14, California Code of Regulations, terms are established for individual state water bottom lease areas in a lease agreement. A lease template approved by FGC in 2011 provides a consistent set of lease terms and conditions, with a provision for special conditions to be established specific to an individual lease area. Currently, there are 15 active state water bottom leases for aquaculture in estuarine environments from Tomales Bay to Morro Bay, plus 2 open coast leases near Santa Barbara.

There has been an increase in public attention focused on (1) shellfish aquaculture practices and stewardship, particularly related to marine debris and certain other practices associated with aquaculture leases within state waters, and (2) siting considerations (e.g., environmental and other human uses) for potential new lease areas. Today provides an update on continuing efforts related to management practices on existing lease areas, and an initial discussion related to planning for possible new lease areas in the future, a topic referred to MRC by FGC in Jun.

- (A) **Existing leases and BMPs:** In early 2015, public comments to FGC requesting greater accountability from lease holders for aquaculture-related debris led DFW and FGC to host a public meeting to explore the topic with stakeholders, regulatory agencies, and shellfish

COMMITTEE STAFF SUMMARY FOR JULY 20, 2017

growers. At the Feb 2016 FGC meeting, staff proposed options to establish a requirement for BMPs unique to each state water bottom lease area (see Feb staff summary in Exhibit A1). FGC ultimately gave direction to pursue a regulatory approach and DFW staff agreed to work with FGC staff, growers, and the public to cooperatively develop categories for best management practices. Today DFW staff will report out on the first public meeting held on Jul 17, 2017 in Marshall, near Tomales Bay (see Exhibit A2), and describe next steps for public engagement.

- (B) **New leases:** Persons wishing to lease a state water bottom for aquaculture are required to make a written application to FGC (Fish and Game Code Section 15403). FGC has not approved a new lease in over 25 years. However, interest in further developing the industry continues to grow, and its value is recognized by the California State Legislature (Exhibit B1). In Feb 2017, FGC received an application for a new lease in Tomales Bay; in addition, an application for new aquaculture lease plots offshore Ventura is being developed. The public has requested to provide input on what information FGC may need to consider before making any determinations to approve new state water bottom lease applications; FGC has referred this topic to MRC for an initial discussion today.

Significant Public Comments

- Comments on item 7A supporting formal aquaculture BMPs that are mandatory, legally binding and adequately enforced, coupled with an inspection and monitoring program. Recommendation that BMPs be enacted before considering new aquaculture leases, and a list of ten proposed BMPs. See exhibits A3 and A4.

Recommendation (N/A)**Exhibits**

- A1. Staff summary from Feb 2016 FGC meeting
- A2. Agenda, location map, and DFW background document for BMP public meeting on Jul 17, 2017
- A3. Email from Ashley Eagle-Gibbs, Esq., Environmental Action Committee of West Marin, received Jul 7, 2017
- A4. Email from Richard James, received Jul 7, 2017
- B1. Bill text for Assembly Joint Resolution 43, adopted Aug 21, 2014

Committee Direction/Recommendation (N/A)

COMMITTEE STAFF SUMMARY FOR JULY 17, 2018

5. SHELLFISH AQUACULTURE BEST MANAGEMENT PRACTICES

Today's Item

Information Direction

Receive overview of public meeting outcomes and discuss next steps in developing a rulemaking to require best management practices (BMPs) plans for state water bottom leases issued by FGC for purposes of aquaculture.

Summary of Previous/Future Actions

- | | |
|--|--|
| • FGC discussed possible BMPs | Feb 10-11, 2016; FGC, Sacramento |
| • FGC supported BMPs rulemaking approach | Jun 22-23, 2016; FGC, Bakersfield |
| • MRC discussed aquaculture debris | Jul 21, 2016; MRC, Petaluma |
| • MRC update on BMPs development | Jul 20, 2017; MRC, Santa Rosa |
| • Last update on BMPs development | Mar 6, 2018; MRC, Santa Rosa |
| • Today's update on BMPs rulemaking | Jul 17, 2018; MRC, San Clemente |

Background

FGC has the authority to lease state water bottoms to any person for the purpose of conducting aquaculture in marine waters of the state, with the exception of Humboldt Bay, under terms agreed upon between FGC and the lessee (Sections 15400 and 15405, California Fish and Game Code). While general regulations in Section 237 govern all aquaculture leases, terms are established for individual state water bottom lease areas in a lease agreement.

Statewide there are currently 17 active FGC-issued state water bottom aquaculture leases with 10 companies. In recent years, public attention has focused on shellfish aquaculture practices and stewardship on certain aquaculture leases, particularly related to marine debris. In 2016, FGC approved a staff recommendation to address the concerns through a rulemaking that would require an FGC-approved shellfish aquaculture BMPs plan for each lease. The regulation would identify what must be addressed in a shellfish aquaculture BMPs plan in order to obtain FGC approval to engage in shellfish aquaculture activities on a state water bottom lease issued by FGC.

MRC had discussions in Jul 2016 and Jul 2017 (see Exhibit 1, part A, for more background), including a report of outcomes from a BMPs public meeting held near Tomales Bay in Jul 2017 (Exhibit 2). At that time, DFW anticipated holding a second public meeting in the southern portion of the state. In Mar 2018, MRC received a more detailed DFW presentation on the status of current State aquaculture leases, the broad scope of current management activities requiring focus in addition to BMPs planning—including compliance efforts and future planning—and a request for prioritization. Several public comments urged DFW to resume focus on developing BMPs requirements and holding the southern public meeting as soon as possible. MRC recommended, and FGC approved, that statewide information-gathering and public engagement efforts to define BMPs plan requirements be prioritized for completion, and requested an update at the next MRC meeting.

COMMITTEE STAFF SUMMARY FOR JULY 17, 2018

In response, DFW and FGC staff jointly held a second public meeting on May 29, 2018, in Santa Barbara (see meeting summary in Exhibit 3), which brought together a broad spectrum of aquaculture and fishing industry members, researchers, and agency representatives. Today, DFW and FGC staff will report on outcomes from the public meeting, present initial BMPs categories derived from public meetings and from research, and discuss next steps in developing draft regulation language for public and MRC review.

Significant Public Comments

One commenter recommends requiring copies of other agency aquaculture permits and requirements associated with the leased aquaculture site in BMPs plans for ease of reference (Exhibit 4).

One commenter expressed support for adopting BMPs identified on the “coastodian dot org” website (previously submitted to MRC), and supports enforcement of BMPs and laws governing aquaculture practices (Exhibit 5).

Recommendation

FGC staff: Support DFW and FGC staff drafting proposed requirements for issues to address in BMPs plans for state water bottom leases based on the concepts presented by staff, providing opportunity for public review of the draft proposal, and scheduling for MRC review and possible recommendation in Nov 2018.

Exhibits

1. Staff summary from Jul 20, 2017 MRC meeting (for background purposes)
2. Summary of BMPs public meeting held in Marshall on Jul 17, 2017
3. Summary of BMPs public meeting held in Santa Barbara on May 29, 2018
4. Email from Bob Johnson, received Apr 1, 2018
5. Email from Don S., received Mar 31, 2018

Committee Direction/Recommendation

MRC recommends that FGC support staff drafting proposed requirements for issues to address within BMPs plans for state water bottom leases based on the concepts presented by staff, providing opportunity for public review of the draft proposal, and scheduling for MRC review and possible recommendation in November 2018.

**California Fish and Game Commission and
California Department of Fish and Wildlife**

**Proposed Requirements for Shellfish Aquaculture Lease
Best Management Practices (BMP) Plans Regulation**

October 24, 2018

Background

The California Fish and Game Commission (Commission) has the authority to lease state water bottoms to any person for the purpose of conducting aquaculture in marine waters of the state, with the exception of Humboldt Bay, under terms agreed upon between the Commission and the lessee (Sections 15400 and 15405, California Fish and Game Code). General regulations in Section 237 of Title 14, California Code of Regulations, govern all aquaculture leases, while terms are established for individual state water bottom lease areas in a lease agreement.

Statewide there are currently 17 active, Commission-issued, state water bottom aquaculture leases with 10 companies. In recent years, public attention has focused on shellfish aquaculture practices and stewardship on certain aquaculture leases, particularly related to marine debris. Responding through Commission-approved best management practices (BMPs) by shellfish aquaculture leaseholders provides a promising approach to collaborative environmental stewardship, adaptive management, and administrative efficiency. In 2016, the Commission approved a staff recommendation to address concerns through a rulemaking that would require growers to develop, and Commission- to approve, a BMP plan for each shellfish aquaculture lease. The regulation would identify what objectives or outcomes must be addressed in the BMP plans in order to obtain Commission approval of that plan.

Stakeholder Outreach to Date

Over the course of two public stakeholder meetings (July 2017 in Marshall, near Tomales Bay, and May 2018 in Santa Barbara), and public briefings to the Commission and its Marine Resources Committee (MRC) over the past three years, staff from the Commission and the California Department of Fish and Wildlife (DFW) have collected input and heard concerns voiced by stakeholders, aquaculture leaseholders, and other responsible agencies on the concept of a shellfish aquaculture BMP rulemaking.

Themes for Possible BMP Categories

At the July 2018 MRC, DFW and Commission staff reported on the outcomes from the public meeting, presented initial BMPs categories derived from the public meetings and from research, and discussed next steps in developing draft regulation language for public and MRC review. DFW noted that many of the concerns voiced during the outreach process are fully or partially addressed by conditions imposed by leases, permits, codes, or regulations at both the state and federal levels (e.g., siting, water quality, navigational hazards, biosecurity, etc.), and recommended that these be excluded from BMP requirements. The remaining

concerns were grouped into several key concepts that could be addressed through BMP plans. Staff has organized these into the following categories:

- **Reduce ocean litter, marine debris, and plastic pollution**
 - Materials, gear design and installation
 - Maintenance and operational preparations, practices and responses
 - Clean-up participation
- **Minimize impacts to living marine resources and their habitats**
 - Wildlife interactions
 - Vessel and vehicle use (water, land, and air)
- **Commit to, train for, and demonstrate compliance with BMP plans**
 - Company standards and worker training

Following discussion, MRC developed a recommendation that the Commission “direct staff to apply the concepts presented during the [MRC] meeting to draft proposed requirements for best management practices plans for state water bottom leases, provide opportunity for public review of the draft proposed language, and schedule the draft proposed language for MRC review and possible recommendation in November 2018.” In August, the Commission adopted the MRC recommendation.

The purpose of this document is to invite public review and feedback on proposed requirements and other considerations for site-specific shellfish aquaculture BMP plans.

Draft Proposed Requirements for Site BMP Plans

Under the envisioned new regulation, current and prospective aquaculture leaseholders would be required to submit proposed BMPs and other required topics within a BMP Plan for each lease site for approval by the Commission before a lessee may engage in lease operations. Site-specific plans are intended to include BMPs that provide environmental stewardship while supporting viable commercial aquaculture production.

Lessees would have to identify in their proposed BMP Plans how they will achieve multiple objectives when engaging in aquaculture operations on their lease site:

- (a) **Reduce Litter, Marine Debris and Plastic Pollution**
 - (1) *Prevention*
 - i. Minimize waste generation through:
 - 1. Material selection.
 - 2. Avoid or phase out single-use materials (e.g., zip ties) that are easily lost, and replace with more durable materials that are re-usable with a long-life span (e.g., stainless steel clips).
 - 3. Avoid floats made of materials that are prone to degradation and decomposition by direct sunlight, especially for floats and buoys.

- ii. Design considerations and adaptation to avoid gear loss:
 1. Ensure that gear is secured to prevent loss (drifting or movement off lease area) under all local weather and sea conditions.
 2. Remove loose supplies prior to leaving lease area (tools, water bottles, etc.).
 3. Secure gear left on lease site, including staging areas.

(2) *Maintenance*

- i. Gear/materials must be maintained in a way to minimize failure, displacement or loss.
 1. All staff responsible to look for and remove, repair, or secure any loose culture gear on or near growing leases on a regular basis, and especially in the event of a storm.
- ii. Continually improve gear to minimize degradation and enhance structural integrity under varying sea conditions.
 1. Operators perform gear maintenance assessments on a _____ basis [*NOTE: frequency to be determined based on public input. Options might include "regular", monthly, quarterly, pre- and post-storm, and/or semi-annually.*]
 2. Operators participate in community-oriented clean-up efforts, and conduct clean-up efforts of their own.

(3) *Recovery*

- i. Lost gear must be recovered by growers where feasible upon recognition that gear is lost.
 1. Method to track gear inventory [*NOTE: What level of accountability for tracking gear inventory is acceptable?*]
- ii. Gear and vessels must be uniquely identifiable to determine the origin.

(1) Gear: Identify approach to uniquely marking gear [e.g., unique color or marking, labelling, or branding of gear and components].

- i. [*NOTE: Which gear types should require marking - all culture gear (grow-out bags, lines, floats) or excluding grow-out bags?*]

(2) Vessels: Uniquely and clearly identify company and/or lease number(s) on all boats and barges used in operations.

- iii. Within 90 days remove culture systems and gear that are not in current or upcoming productive use.

(b) ***Minimize Impacts to Living Marine Resources and Their Habitats***

(1) Measures to avoid or minimize harm to wildlife, including seabirds, marine mammals, turtles, and protected species:

- i. Avoid disturbance of roosting birds and marine mammal haul-outs
- ii. Avoid and minimize harm to sensitive biogenic habitat eelgrass and kelp within the lease area, including damage from vessel (e.g.,

propeller cuts), air (e.g., drones), gear placement (e.g., shading or direct contact), and foot traffic (i.e., trampling).

(c) ***Prevent Spread of Disease or Invasive Species for Biosecurity***

NOTE: DFW has identified that this category is partially addressed in existing regulations; however, there remain gaps that can be addressed by BMPs. DFW recommends adding this to the list of BMP categories, as follows:

- (1) Measures taken to prevent the movement or transfer between watersheds of livestock, wetted gear, and equipment to maintain biosecurity.
- (2) Source seed and broodstock from approved origins.
- (3) Responses to biofouling and employing other measures to prevent the spread of aquatic invasive species

(d) ***BMP Commitment, Compliance and Verification***

- (1) *Staff trainings* - Incorporate employee training program with focus on environmental stewardship, litter and marine debris reduction, and good-neighbor practices. *[NOTE: Growers may be able to partner with other local organizations and agencies regarding implementation of a training program.]*
- (2) *Elements to demonstrate compliance* - Describe process to certify compliance with BMP Plan through regular monitoring, reporting, and site-inspection program to ensure operations are in compliance with BMPs. Options:
 - i. Self-monitoring and documentation of compliance activities
[NOTE: consider mode of keeping and maintaining records and availability.]
 - ii. Inspections conducted by certified/approved third-party inspectors *[NOTE: Random, bi-annual, or annual basis.]*
 - iii. Option of demonstrated compliance:
 1. First year [or first and second years] after BMP plan approval: Maintain records, submit report quarterly, and inspection bi-annually for performance and effectiveness.
 2. Subsequent years (when performance and effectiveness is certified by inspector). Reduce frequency of reporting and inspection requirements [frequency?]. All records maintained and available on site.

Additional Considerations

Commission and DFW engagement

- Annual public discussions suggested
- The Commission and DFW will work with growers if concerns or potential non-compliance with BMPs are identified
- The Commission may suspend or terminate a lease if activities are found to not be in compliance with BMPs, and lessee has not remedied the situation within a reasonable, specified time

COMMITTEE STAFF SUMMARY FOR NOVEMBER 14, 2018**6. SHELLFISH AQUACULTURE BEST MANAGEMENT PRACTICES****Today's Item**Information Direction

Receive update on progress developing a proposed regulation to require BMP plans for state water bottom leases issued by FGC for aquaculture, and discuss next steps and possible recommendation.

Summary of Previous/Future Actions

- | | |
|--|--------------------------------------|
| • FGC discussed possible BMPs | Feb 10-11, 2016; Sacramento |
| • FGC supported BMPs rulemaking approach | Jun 22-23, 2016; Bakersfield |
| • MRC discussed aquaculture debris | Jul 21, 2016; MRC, Petaluma |
| • MRC update on BMPs development | Jul 20, 2017; MRC, Santa Rosa |
| • Update on management activities | Mar 6, 2018; MRC, Santa Rosa |
| • Draft BMP categories presented to MRC | Jul 17, 2018; MRC, San Clemente |
| • Today's update | Nov 14, 2018; MRC, Sacramento |

Background

FGC has the authority to lease state water bottoms to any person for the purpose of conducting aquaculture in marine waters of the state, with the exception of Humboldt Bay and San Diego Bay, under terms agreed upon between FGC and the lessee (sections 15400 and 15405, California Fish and Game Code). While general regulations in Section 237 govern all aquaculture leases, terms are established for individual state water bottom lease areas in a lease agreement.

Statewide there are currently 17 active FGC-issued aquaculture leases, of which 16 culture shellfish species and one cultures algae. In recent years, public attention has focused on shellfish aquaculture practices and stewardship on certain aquaculture leases, particularly related to marine debris. In 2016, FGC approved a staff recommendation to address the concerns through a rulemaking that would require an FGC-approved shellfish aquaculture BMPs plan for each lease site. The regulation would identify what must be addressed in a shellfish aquaculture BMPs plan in order to obtain FGC approval to engage in shellfish aquaculture activities on a state water bottom lease issued by FGC.

Since Jul 2016, MRC has received input and tracked progress on aquaculture BMPs project activities (see Exhibit 1 for more background). Regional public meetings to solicit input were jointly held by DFW and FGC staff in Jul 2017 near Tomales Bay, and in May 2018 in Santa Barbara, with broad public and industry engagement.

At the Jul 2018 MRC meeting, DFW and FGC staff presented initial BMP categories derived from public meetings, public comments, and staff research, and recommended the categories be used to draft requirements language for public and MRC review. Based on a resulting MRC recommendation, FGC directed staff in Aug 2018 to "draft proposed requirements for issues to address within BMPs plans for state water bottom leases based on the concepts presented by

COMMITTEE STAFF SUMMARY FOR NOVEMBER 14, 2018

staff, provide opportunity for public review of the draft proposal, and schedule for MRC review and possible recommendation in Nov 2018.

Following the Aug meeting, DFW and FGC staff developed proposed BMP requirements for all categories, and distributed them electronically on Oct 24, 2018 (Exhibit 2) for comment with a request for feedback by Nov 2. On Oct 25, 2018, staff held a public meeting in Santa Rosa to review the proposed requirements and options, and heard public discussion and input (Exhibit 3). Comments provided in writing through Nov 2, 2018 are provided in exhibits 4-7.

At this meeting, staff will present a summary of comments received at the Oct 25, 2018 meeting and in writing.

Significant Public Comments

- Approximately 25 public meeting attendees (aquaculturists, community members, academics, and agency staff) provided oral comments with different perspectives on the BMP requirements proposal developed by staff.
- An aquaculture lease holder offered written comments on the staff proposal: (1) supports the general categories; (2) recommends revising language to employ a non-prescriptive approach to regulatory language, which provides flexibility and adaptation of operational practices; (3) opposes mandatory marking of gear and boats, but offers alternatives for gear identification; (4) for compliance assessment, prefers DFW conduct inspections rather than more expensive third parties and suggests cost-sharing equitably amongst growers; and (5) asks for recognition of the good stewardship practices the growers have already put into place (Exhibit 4).
- A local advocate and an environmental non-profit offered written comments on the staff proposal: (1) requested an extension of time to review proposed requirements; (2) generally supports proposal; (3) supports marking of gear and boats; (4) supports regular assessments and data collection; (5) supports mandatory, unannounced inspections by DFW and FGC and/or a third party; and (6) proposed additions to the BMPs (exhibits 5 and 6).
- A local resident near Tomales Bay offers 11 BMPs, some of which are new or more stringent than those in the staff proposal (Exhibit 7).
- Many excellent suggestions are made for revisions within the proposed BMP requirements language. For example, feedback from growers and DFW field staff highlighted approaches to enhance feasibility for implementation and compliance.
- Several commenters at the public meeting, and in writing requested additional time to provide input on the staff-developed requirements language.

Recommendation

FGC staff:

Authorize staff to (1) integrate public input into the proposed BMP requirements; (2) provide additional opportunity for public input; (3) develop recommendations for areas of divergence

COMMITTEE STAFF SUMMARY FOR NOVEMBER 14, 2018

among stakeholders; and (4) provide a final proposal and options, if needed, for MRC review and possible recommendation in Mar 2019.

Exhibits

1. Staff summaries from Jul 20, 2017 and Jul 17, 2018 MRC meetings (for background purposes)
2. Agenda for BMPs public meeting in Santa Rosa, Oct 25, 2018
3. DFW and FGC staff-proposed requirements for shellfish aquaculture lease BMP plans, Oct 24, 2018
4. Email from Terry Sawyer, Hog Island Oyster Company, received Nov 2, 2018
5. Email from Ashley Eagle-Gibbs, Marin Environmental Action Committee, received Nov 2, 2018
6. Email from Richard James, received Nov 2, 2018
7. Email from Cynthia Harland, received Oct 18, 2018

Committee Direction/Recommendation

MRC recommends that FGC authorize staff to revise the proposed requirements for issues to address within BMPs plans for state water bottom leases based on public input; provide opportunity for public review of the revised draft proposal; develop options for areas of divergence among interest groups, if needed; and schedule for MRC review and possible recommendation in March 2019.



Dungeness Crab Fishing Gear Working Group

Working Collaboratively to Reduce the Risk of Whale Entanglement in the California Dungeness Crab Fishery

The California Dungeness Crab Fishing Gear Working Group is a collaboration among multiple diverse stakeholder groups who have come together to tackle the challenge of reducing the risk of whale entanglements in Dungeness crab fishing gear. This group strives to find solutions that support thriving whale populations along the West Coast and a thriving and profitable Dungeness crab fishery.

THE ISSUE OF WHALE ENTANGLEMENTS IN FISHING GEAR

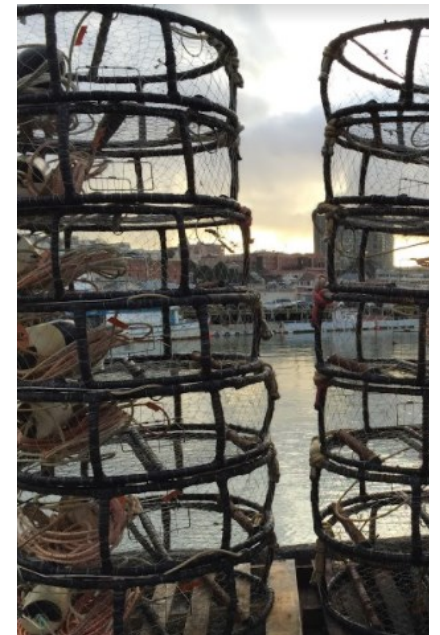
Variable, dynamic ocean conditions are impacting California's valuable natural resources, human populations, and marine life. Recently, oceanographic and biological changes due to warmer water off the West Coast have led to delays and closures of commercial and recreational fishing seasons, altering the dynamics of fishing activity. At the same time, growing whale populations and shifts in their feeding patterns have resulted in an increased risk of whales interacting with fishing gear. In recent years, reports of whales entangled in fishing gear off California have been higher as compared to the historical number of reports since NOAA Fisheries started keeping records in 1982. A variety of factors may contribute to the increase in the number of reported entanglements, including changes in the distribution and abundance of whales, changes in fishing effort, and an increase in public awareness and reporting. Although there are many unknowns, multiple fisheries have been identified as entangling whales, including the Dungeness crab fisheries on the California coast. This creates social, environmental and regulatory challenges. It also creates risk for marine mammals and threatens the stability and viability of an important fishery and coastal fishing communities dependent on this fishery. State and federal agencies, fishermen, environmental organizations and scientists have been responsive to this issue and are working collaboratively to identify and implement solutions.

THE FORMATION OF THE DUNGENESS CRAB FISHING GEAR WORKING GROUP

In response to the recent spike in whale entanglements, the California Department of Fish and Wildlife (CDFW), in partnership with National Marine Fisheries Service (NMFS) and the California Ocean Protection Council (OPC), convened the Dungeness Crab Fishing Gear Working Group (the Working Group) to tackle the challenge of reducing the risk of whale entanglements in the California Dungeness crab fishery.



Photo Courtesy of Jakara Hubbard



Established in September 2015, the 20-member Working Group is a unique coalition of diverse stakeholders, including commercial and recreational fishermen, environmental organization representatives, members of the whale entanglement response network, and state and federal agencies. All experts in their field, these individuals have voluntarily come to the Working Group with the common goal of supporting thriving whale populations along the West Coast and a thriving and profitable Dungeness crab fishery. Scientists, legislative staff, and gear manufacturers also participate in Working Group meetings to support and inform discussions. Since its creation, the Working Group has met seven times, and participants are committed to identifying solutions to this complex issue.

Members of the Working Group are committed to identifying solutions to the entanglement challenge. Participants have been responsive to the issue and have volunteered their time and expertise to work collaboratively towards feasible, tangible solutions. The Dungeness Crab Fishing Gear Working Group is a prime example of constituents with diverse expertise and interests uniting for a shared goal.

SUPPORTING COLLABORATIVE PROJECTS

The Working Group is currently working on the following activities: (1) supporting the implementation of collaborative projects to collect new information and synthesize existing information to enhance our understanding of whale distribution and fishing dynamics, and to test gear modifications; (2) developing effective communications materials and conducting outreach, such as the development and sharing of a Best Practices Guide. It is important to have the support of the Dungeness crab fleet, state legislators, and all stakeholders to advance these projects and to address the whale entanglement issue.

- **Whale forage distribution research:** Researchers from the UC Santa Cruz and the Southwest Fisheries Science Center are leading a project to: organize historical data, including existing ocean condition data, prey distribution patterns, and whale sightings; create maps of existing data relative to historical entanglement patterns; and evaluate capabilities to forecast whale distributions.



California Dungeness Crab Fishing
2017-18 Best Practices Guide to Minimize Whale Entanglement Risk

Support for Best Practices
 National Marine Fisheries Service (NMFS) has confirmed significant increases in large whale entanglements over the last few years, and specifically in California Dungeness crab fishing gear. This situation threatens the stability of the fishery and coastal fishing communities. In response, a Working Group has developed this Best Practices Guide to highlight voluntary actions believed to be an important step towards reducing whale entanglements.

BEST PRACTICES

- No excess lines should be floating at the surface. Floating line should only be between the main buoy and trailer.
- When changing set location across depths, adjust the length of trap lines by adjusting shots (i.e., measured length of line) to maintain taut vertical lines.
- Avoid setting gear in the vicinity of whales whenever possible.
- Maintain gear to ensure lines and buoys are in good working condition and will not break under natural conditions causing gear to become lost or irretrievable. Lost gear contributes to marine debris and increases risk of whale entanglements.
- All gear should be clearly marked consistent with applicable regulation. All gear should be maintained so markings are clearly legible to facilitate correct identification of the origins of the gear involved in entanglements.
- Use the minimum amount of scope required to compensate for tides, currents and weather. Whales are more likely to become entangled with slack lines, which can potentially create a "floating snare".
- Remove all fishing gear by the end of the season when gear is no longer allowed in the water.

BUOY SET-UP BEST PRACTICES

RECREATIONAL shortest as possible, max of 2 fathoms (12M)

COMMERCIAL

Inside 30 fathoms shortest as possible, max of 3 fathoms (18M)

30-50 fathoms shortest as possible, max of 4 fathoms (24M)

Outside 50 fathoms shortest as possible, max of 5 fathoms (30M)

Minimize # of buoys in set up—no more than 1 trailer buoy inside 30 fathoms. Keep line between trap and main buoy running vertical and taut.

1 fathom = 6 feet

- **Disentanglement Trainings:** NMFS, in partnership with California Whale Rescue, The Nature Conservancy (TNC), and the Working Group, are training commercial and recreational fishermen in whale entanglement response.
- **Gear modification:** A federally funded Bycatch Reduction Engineering Program project is underway where scientists, in collaboration with fishermen, evaluate the line profiles and load strengths of different types of fishing line, as well as the visual contrast of different line types/colors in the water column.
- **Whale and crab gear distribution surveys:** The Working Group has worked in partnership with the National Marine Sanctuaries, Point Blue Conservation Science, NMFS, Oceana, and LightHawk to conduct a series of aerial and cruise vessel surveys to document the distribution of whales and crab fishing gear.
- **Electronic reporting tool research:** Fishing participants are working with CDFW and TNC to conduct a series of pilot projects on different types of data loggers, with a focus on solar loggers and TNC’s eCatch, to gain a more comprehensive understanding of fishing dynamics.

LOOKING AHEAD: CONTINUED COLLABORATION

In addition to collaborative research projects and the Best Practices Guide, the Working Group also looks forward to piloting a draft voluntary risk assessment and mitigation program in the upcoming 2017-2018 Dungeness crab fishing season. Throughout 2017 and into 2018, the Working Group will continue to support implementation of collaborative projects and communications; provide guidance and recommendations to the California Dungeness crab fishing industry, the Dungeness Crab Task Force, and the state of California about how to reduce the risk of whale entanglements; and identify measures to address the entanglement issue.

Best Practices Guide to Minimize Whale Entanglement Risk

The Working Group developed several voluntary “best practices” focused on recommendations for surface gear set up for the 2017-18 fishing season, including improved buoy setup, reduced slack surface line, and limited number of trailer buoys. More than 2,250 copies of the resulting Best Practices Guide are being shared widely with fishing associations, local gear stores, fishing harbors, and by CDFW Enforcement, the US Coast Guard, and the California Recreational Fishing Survey surveyors, as well as online distribution via CDFW and recreational fishing clubs.

CALIFORNIA DUNGENESS CRAB FISHING GEAR WORKING GROUP

Guidelines for Research and Development Projects

Focus on Ropeless Gear Innovations

February 2019

The California Dungeness Crab Fishing Gear Working Group (Working Group) is committed to reducing the risk of whale entanglements in Dungeness crab fishing gear while supporting thriving whale populations and a thriving and profitable Dungeness crab fishery along the West Coast. Since 2017, the Working Group has developed the [Risk Assessment and Mitigation Program \(RAMP\)](#), which is designed to identify and assess elevated levels of entanglement risk of whales and other marine life and determine the need for management options to mitigate risk. The Working Group is interested in working with the agencies, fishermen, researchers, innovators, and others to develop management ideas and options to include in the RAMP's draft [Management Measures Toolbox \(MMT\)](#). This includes the research and development of fishing gear innovations and technologies.

In October 2018, the Working Group submitted a recommendation to the California Ocean Protection Council, California Department of Fish and Wildlife (CDFW), and the Pacific States Marine Fisheries Commission to establish a clear and transparent process to prioritize funding for research and development projects ([here](#)). The Working Group has developed the following guidelines to specify key benchmarks that are essential to consider during the development phase and prior to widespread use of any new gear innovation (low tech or high tech). The Working Group recommends that innovators and entrepreneurs consider the following when developing gear innovations to reduce entanglement risk. The Working Group also requests that agencies consider the following when developing criteria to review and evaluate gear innovation funding proposals at the research and development phase to ensure gear innovations are suitable for implementing at a broader scale.

Based on gear innovation discussions to date, this guidance is focused primarily on ropeless gear technologies. However, the Working Group envisions that these guidelines will be applicable to other gear innovations. For additional information about the Working Group's efforts regarding research and development projects, please contact info@cawhalesgroup.com or Paige Berube (Ocean Protection Council, paige.berube@resources.ca.gov), and visit <http://www.opc.ca.gov/whale-entanglement-working-group>.

Ropeless Gear Innovations Guidelines

The Working Group has identified the following priorities for successful gear innovation efforts. At-sea testing of technologies that meet these guidelines, or projects intended to develop or advance existing technologies to meet these guidelines should be prioritized.

- **Enforceable** - The location of gear must be available to CDFW's Law Enforcement Division (LED), either visually or virtually, to ensure fishermen are fishing within their trap limit allotment, aren't fishing in Marine Protected Areas or other restricted areas, etc. Gear innovations that fail to provide the location of gear will not be adopted or allowed for commercial use. Lost and abandoned gear should be easily traced to encourage responsible ownership and allow for enforcement actions.

- **Economical** - The cost to obtain the new gear innovation needs to be practical relative to the economics of the fishery. In addition, there is an average loss rate which adds additional annual costs for new gear. Conversely, some gear innovations may reduce gear loss relative to current operations. Gear innovation must consider how to reduce loss rates and/or keep additional costs to a minimum. Gear innovation may test ways to reconfigure gear to reduce costs.
- **Fishable** - Gear innovation must be configured and deployed in a manner compatible with the operation of the fleet, for both small and large boat operations. Deployment and retrieval must be practical, simple, and efficient with time. In addition, the location of the gear must be easily identified by other fishermen in the vicinity; it is an added bonus if gear design prevents theft.
- **Reliable** - The gear must have demonstrated a low failure rate in varied ocean conditions (i.e., gear was consistently and successfully deployed and retrieved) and must have a functioning prototype. Projects should consider testing gear to determine failure rates of actual equipment in varied ocean conditions.
- **Safe** - The gear must be proven to be safe for use in rough ocean conditions being mindful of the fishing vessel capabilities operating the gear.
- **Minimize adverse impacts to marine life** - Gear innovation must minimize potential negative impacts to whales or other species of concern, including the potential for acoustic release mechanisms to emit sounds that may disrupt the behavior or injure marine life, especially when the gear is in high concentrations.

Marine Resources Committee (MRC) 2018-2019 Work Plan
Scheduled Topics and Timeline for
Items Referred to MRC from California Fish and Game Commission
Updated February 11, 2019

Topic	Category	2018	2019		
		NOV	MAR	JUL	NOV
		Sacramento	Sacramento	San Clemente	Sacramento
Planning Documents					
MLMA Master Plan for Fisheries - Implementation Updates	Master Plan Implementation	X	X	X	X
Abalone FMP / ARMP Update	FMP	X	X	X	X
Herring Fishery and FMP Update	FMP		X		
Aquaculture Programmatic Environmental Impact Report (PEIR)	Programmatic Plan	X	X	X	
Regulations					
Aquaculture Lease Best Management Practices (BMP) Plan Requirements	DFW-FGC Project/ Rulemaking	X/R	X/R	X	
Kelp & Algae Commercial Harvest	DFW Project/ Rulemaking			X	
Emerging/Developing Management Issues					
Aquaculture State Water Bottom Leases: Existing and future lease considerations	Lease Management Review				
Special Projects					
California's Coastal Fishing Communities	MRC project	X	X/R	X	
Informational / External Topics of Interest					
Marine Debris and Plastic Pollution (updates upon request)	Informational				
BOEM Offshore Wind Energy Project (updates upon request)	Informational				
Lobster Advisory Committee lessons learned report - presentation by Heal the Bay	Informational	X			
Commercial trap fishing gear innovations to reduce risk of entanglements	Informational		X		

KEY: X Discussion scheduled X/R Recommendation developed and moved to FGC

California Fish and Game Commission – Perpetual Timetable for Anticipated Regulatory Actions
(dates shown reflect the date intended for the subject regulatory action)

Updated: 02/13/19

For FGC Staff Use				REGULATORY CHANGE CATEGORY	ACTION DATE, TYPE AND LOCATION	2019												2020							
QUARTERLY EFFECTIVE	DFW RU ANALYST	FGC ANALYST	LEAD			MAR 20	APR 17	MAY 16	MAY 16	JUN 11	JUN 12	JUN 13	JUL 11	AUG 7	AUG 8	SEP 5	OCT 8	OCT 9	OCT 10	NOV 5	DEC 11	DEC 12	JAN TBD	FEB	FEB
						MRC SACRAMENTO	FGC SANTA MONICA	WRC SACRAMENTO	TELECONFERENCE SACRAMENTO, FAIRFIELD, ARCATA, SAN DIEGO	TC REDDING	FGC REDDING	MRC SAN CLEMENTE	FGC SACRAMENTO	WRC SANTA ROSA	TC SAN DIEGO	FGC SAN DIEGO	MRC SACRAMENTO	FGC SACRAMENTO	WRC TBD	TC	FGC				
				File Notice w/OAL by Notice Published		02/19/19 03/01/19				04/16/19 04/26/19		06/11/19 06/21/19				08/15/19 08/23/19		10/15/19 10/25/19							
				Title 14 Section(s)																					
*	MR	ST	HCB	Coast Yellow Leptosiphon and Lassics Lupine	670.2							E 7/1													
	MS	ST	MR	Recreational Take of Red Abalone	29.15							E 4/1													
*	MR	ST	MR	Commercial Logbooks	107, 174 and 176							E 4/1													
	OA	JS	FB	Sport Fishing (Annual)	1.53, 1.74, 5.00							E 3/1													
	MR	DT	MR	Recreational Purple Sea Urchin (Regular Rulemaking)	29.06								E 5/1												
	TBD	TBD	WLB	Wildlife Areas/Public Lands and Ecological Reserves	550, 550.5, 551 AND 630												N			D				A	
	OA	SF/CC	MR	Sheephead Fillet	27.65(b)								E 7/1												
	MR	JS	WLB	Mammal Hunting, including deer/elk tag validation	362, 364, 364.1, 708.6							A	V								N			D	
	MR	JS	LED	Archery Equipment and Crossbow	354(f)							A													
	MR	JS	WLB	Waterfowl (Annual)	502, 509							A	V											D	
	OA	SF/CC	FB	Klamath River Basin Sport Fishing (Annual)	7.50(b)(91.1)							D	V	A										D	
	OA	SF/CC	FB	Central Valley Salmon Sport Fishing (Annual)	7.50(b)(5), (68), (124), (156.5)							D	V	A										D	
	TBD	CC	MR	Hagfish traps permitted on single vessel	180.6																				
*	MR	ST	MR	Recreational and Commercial Pacific Herring (fishery management plan implementation)	27.60, 28.60, 28.62, 163, 163.1, 163.5, 164							V												E 1/1	
	OA	JS	FB	Statewide Sport Fishing Revisions and Simplification for 2020	TBD																				

RULEMAKING SCHEDULE TO BE DETERMINED

*			MR	Commercial Kelp and Algae Harvest Management	165, 165.5, 704								V											
*				Possess Game / Process Into Food	TBD																			
*			OGC	American Zoological Association / Zoo and Aquarium Association	671.1																			
				Night Hunting in Gray Wolf Range	474																			
				Shellfish Aquaculture Best Management Practices	TBD						R												V	
*				Ban of Neonicotinoid Pesticides on Department Lands	TBD																			
*			MR	Commercial Pink Shrimp Trawl	120, 120.1, 120.2																			
*			MR	Ridgeback Prawn Incidental Take Allowance	120(e)																			

EM = Emergency, EE = Emergency Expires, E = Anticipated Effective Date (RED "X" = expeditious OAL review), N = Notice Hearing, D = Discussion Hearing, A = Adoption Hearing, V = Vetting, R = Committee Recommendation, WRC = Wildlife Resources Committee, MRC = Marine Resources Committee, TC = Tribal Committee