

**California Fish and Game Commission**  
**Marine Resources Committee**  
**Meeting Binder**

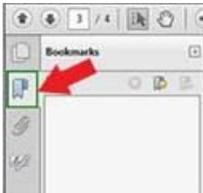


**November 5, 2019**  
**Sacramento**

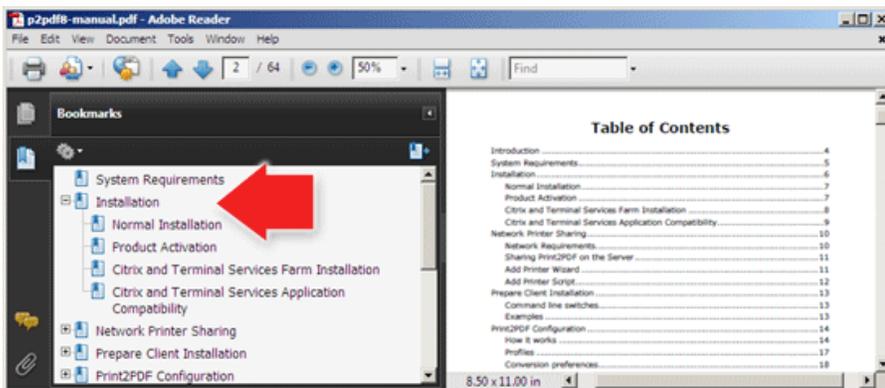
## EASY GUIDE TO USING THE BINDER

Note: We make every effort to ensure that documents we produce are compliant with Americans with Disabilities Act standards, pursuant to state and federal law; however, some materials included in our meeting binders that are produced by other organizations and members of the public may not be compliant.

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**

Peter Silva	Co-Chair (Jamul)
Samantha Murray	Co-Chair (Del Mar)

## **COMMISSION STAFF**

Melissa Miller-Henson	Executive Director
Elizabeth Pope	Acting Marine Advisor
Sergey Kinchak	Staff Services Analyst

## **DEPARTMENT OF FISH AND WILDLIFE**

Craig Shuman	Regional Manager, Marine Region
Bob Puccinelli	Captain, Law Enforcement Division

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

**Samantha Murray**, Member

Del Mar

STATE OF CALIFORNIA

Gavin Newsom, Governor

**Melissa Miller-Henson**

**Executive Director**

P.O. Box 944209

Sacramento, CA 94244-2090

(916) 653-4899

[fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)

[www.fgc.ca.gov](http://www.fgc.ca.gov)

## Fish and Game Commission



*Wildlife Heritage and Conservation*

*Since 1870*

### MARINE RESOURCES COMMITTEE

Committee Co-chairs: Commissioner Murray and Commissioner Silva

#### Meeting Agenda

**November 5, 2019; 9:00 a.m.**

**Natural Resources Building  
12<sup>th</sup> Floor Conference Room  
1416 Ninth Street, Room 1206  
Sacramento, CA 95814**

This meeting will be audio-recorded.

**NOTE: 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) Ocean Protection Council

(B) Department

I. Marine Region

a. Update on rulemaking to consider changes to commercial herring eggs on kelp regulations

II. Law Enforcement Division

(C) Commission staff

4. **Experimental Fishing Permit (EFP) Phase II**  
Receive Department overview and update on developing an EFP Program pursuant to Fish and Game Code Section 1022, including public outreach efforts.
5. **Marine Life Management Act (MLMA) master plan implementation**  
Receive Department update on implementing the 2018 master plan for fisheries, including a draft prioritized list of fisheries for more focused management, and consider possible recommendation.
6. **Kelp and algae commercial harvest regulations**  
Receive Department update on progress in developing proposed changes to commercial kelp and algae harvest regulations.
7. **Red Abalone Fishery Management Plan (FMP)**  
Receive Department update on collaborative progress in completing a Red Abalone FMP.
8. **Kelp restoration and recovery efforts**  
Receive Department overview and update on the development of kelp restoration strategies, including purple urchin removal experiments conducted in collaboration with stakeholders.
9. **Whale and turtle protections in the recreational Dungeness crab fishery**  
Discuss and consider possible recommendations for management strategies to provide additional whale and turtle protections in the recreational Dungeness crab fishery.
10. **Coastal Fishing Communities Project**  
Receive staff update on the Coastal Fishing Communities Project, potentially recommend adopting the draft final staff synthesis report, and discuss next steps.
11. **Future agenda items**
  - (A) Review work plan agenda topics and timeline
  - (B) Potential new agenda topics for FGC consideration

Adjourn

**CALIFORNIA FISH AND GAME COMMISSION  
2019 MEETING SCHEDULE**

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

<b>Meeting Date</b>	<b>Commission Meeting</b>	<b>Committee Meeting</b>	<b>Other Meetings</b>
December 11-12	Natural Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814		

<b>2020</b>			
<b>Meeting Date</b>	<b>Commission Meeting</b>	<b>Committee Meeting</b>	<b>Other Meetings</b>
January 16		<b>Wildlife Resources</b> Los Angeles area	
January 17		<b>Tribal</b> Los Angeles area	
February 5-6	Natural Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814		
March 17		<b>Marine Resources</b> Justice Joseph A. Rattigan Building Conference Room 410 (4 <sup>th</sup> Floor) 50 D Street Santa Rosa, CA 95404	
March 18			<b>Annual Tribal Planning</b>
April 15-16	Natural Resources Building Auditorium, First Floor 1416 Ninth Street Sacramento, CA 95814		
May 14	<b>Teleconference</b> Santa Rosa, Sacramento, Arcata, and San Diego		

2020			
Meeting Date	Commission Meeting	Committee Meeting	Other Meetings
May 14		<b>Wildlife Resources</b> Justice Joseph A. Rattigan Building Conference Room 410 (4 <sup>th</sup> Floor) 50 D Street Santa Rosa, CA 95404	
June 24-25	Santa Ana area		
July 21		<b>Marine Resources</b> San Clemente area	
August 18		<b>Tribal</b> Fortuna area	
August 19-20	Fortuna area		
September 17		<b>Wildlife Resources</b> Natural Resources Building Redwood Room, 14 <sup>th</sup> Floor 1416 Ninth Street Sacramento, CA 95814	
October 14-15	Elihu M Harris Building Auditorium 1515 Clay Street Oakland, CA 94612		
November 9		<b>Tribal</b> Monterey area	
November 10		<b>Marine Resources</b> Monterey area	
December 9-10	San Diego area		

### OTHER 2019 AND 2020 MEETINGS OF INTEREST

#### Association of Fish and Wildlife Agencies

- No additional 2019 meetings are scheduled at this time
- March 8-13, 2020, Omaha, NE
- September 13-16, 2020, Sacramento, CA

#### Pacific Fishery Management Council

- November 13-20, Costa Mesa, CA
- March 3-9, 2020, Rohnert Park, CA
- April 3-10, 2020, Vancouver, WA
- June 11-18, 2020, San Diego, CA
- September 10-17, 2020, Spokane, WA
- November 13-20, 2020, Garden Grove, CA

### **Pacific Flyway Council**

- No additional 2019 meetings are scheduled at this time
- March 2020 (date/location TBD)
- August/September 2020 (date/location TBD)

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

- No additional 2019 meetings are scheduled at this time
- January 9-12, 2020, Monterey, CA
- July 9-14, 2020, Park City, UT

### **Wildlife Conservation Board**

- November 21, Sacramento, CA
- No additional 2020 meetings scheduled at this time

## **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](mailto:fgc@fgc.ca.gov); **mail** to California Fish and Game Commission, P.O. Box 944209, Sacramento, CA 94244-2090; **deliver** to California Fish and Game Commission, 1416 Ninth

Street, Room 1320, Sacramento, CA 95814; or **hand-deliver to a Committee meeting.**

### **COMMENT DEADLINES**

The **Written Comment Deadline** for this meeting is **5:00 p.m. on October 23, 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 October 31, 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 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.
5. If speaking during general public comment, the subject matter you present should not be related to any item on the current agenda (public comment on agenda items will be taken at the time the Committee members discuss that item). As a general rule, general public comment is an opportunity to bring matters to the attention of the Committee, but you may also do so via email or standard mail. At the discretion of the Committee, staff may be requested to follow up on the subject you raise.

### **VISUAL PRESENTATIONS/MATERIALS**

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

1. Electronic presentations must be provided by email 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 NOVEMBER 5, 2019

**2. PUBLIC COMMENT****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**

1. A NOAA Fisheries representative sent a copy of the agency's latest comprehensive report on recovering threatened and endangered species; the cover email highlights its Species in the Spotlight Initiative and actions taken to recover nine species, notably including Central California Coast Coho Salmon (Exhibit 1).

**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 agenda items*.

**Exhibits**

1. [Email from Erin Seghesio, Recovery Coordinator, NOAA Fisheries, West Coast Region, with National Marine Fisheries Service report: Recovering Threatened and Endangered Species, FY 2017-2018 Report to Congress, received Oct 18, 2019](#)

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

## COMMITTEE STAFF SUMMARY FOR NOVEMBER 5, 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), DFW, and Commission staff.

**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:** Jenn Eckerle, Deputy Director

(B) **DFW:**

I. *Marine Region:* Regional Manager Craig Shuman

- i. Update on rulemaking to consider changes to commercial herring eggs on kelp regulations; as requested by FGC in Oct 2019 as clean-up to the Pacific Herring Fishery Management Plan (FMP) implementing regulations (Exhibit 1).

II. *Law Enforcement Division:* Captain Bob Puccinelli

(C) **FGC staff:** At its Sep 3 teleconference, FGC selected Melissa Miller-Henson as its new executive director, which officially left the deputy executive director position vacant. The recruitment process to fill the deputy executive director position has begun. FGC's marine advisor Susan Ashcraft is continuing as acting deputy executive director and Elizabeth Pope, on loan from DFW's Marine Region, continues as acting marine advisor.

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

1. [DFW presentation](#)

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

## STAFF SUMMARY FOR NOVEMBER 5, 2019

**4. EXPERIMENTAL FISHING PERMIT PROGRAM (PHASE II)****Today's Item****Information** **Action** 

Receive DFW overview and update on developing Phase II regulations to establish an Experimental Fishing Permit (EFP) Program, including public outreach efforts.

**Summary of Previous/Future Actions**

- FGC approved two-phase rulemaking approach Jun 12-13, 2019; Redding
- FGC adopted EFP Phase I regulations Oct 9-10, 2019; Valley Center
- **Today receive overview of EFP Phase II Nov 5, 2019; MRC; Sacramento**

**Background**

On Jan 1, 2019, Fish and Game Code Section 1022 was enacted as part of the Fisheries Innovation Act of 2018, providing FGC the authority to approve EFPs, to be issued by DFW, that authorize commercial or recreational marine fishing activities otherwise prohibited by code or regulation. Section 1022 requires that FGC establish by regulation "an expeditious process" for DFW review, public notice and comment, FGC approval, and prompt DFW issuance of EFPs. The new law repealed and replaced Section 8606, which authorized FGC to approve experimental gear permits (EGPs).

In Jun 2019, FGC approved a DFW recommendation to pursue implementing regulations for an EFP program through a two-phased approach:

- Phase I, to authorize FGC to approve EFPs specifically for continuing the experimental brown box crab fishery currently underway under EGPs previously approved by FGC (through Mar 2020), and
- Phase II, which focuses on developing a broader EFP program through regulations that define a clear application and participation process for future EFPs.

Phase 1 was completed in Oct 2019 with adoption of regulations and Phase 2 is currently under development. DFW and FGC staff, in partnership with The Nature Conservancy, are scheduled to host a public workshop on Jan 14, 2020; the workshop is a first step to initiate dialogue among stakeholders regarding how to best design a state EFP program that meets requirements of Fish and Game Code Section 1022 while accounting for stakeholder needs. Workshop information, including its purpose and objectives, are included as Exhibit 1.

Today, DFW will provide an overview of Phase II EFP program development; this is also an opportunity to discuss and solicit feedback on the Jan 2020 workshop and a potential timeline for program development.

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

1. [Stakeholder workshop public flyer, Implementing the California Fisheries Innovation Act of 2018: Experimental Fishing Permit Program](#)

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

## STAFF SUMMARY FOR NOVEMBER 5, 2019

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

Receive DFW update on implementing the 2018 master plan for fisheries, including a draft prioritized list of fisheries for more focused management, and consider a possible recommendation.

**Summary of Previous/Future Actions**

- |  |                                     |
|--|-------------------------------------|
| • FGC adopted 2018 master plan         | Jun 20-21, 2018; Sacramento         |
| • Implementation update                | Mar 20, 2019; MRC, Sacramento       |
| • Implementation update                | Jul 11, 2019; MRC, San Clemente     |
| • <b>Today's update and discussion</b> | <b>Nov 5, 2019; MRC, Sacramento</b> |

**Background**

This is a standing agenda item for MRC to receive DFW updates on and discuss steps, priorities, and opportunities related to implementing the *2018 Master Plan for Fisheries: A Guide for Implementation of the Marine Life Management Act (2018 Master Plan)*. Adopted by FGC, the 2018 Master Plan serves as a framework for Marine Life Management Act (MLMA) based management. Exhibit 1 provides additional background.

A key implementation step, consistent with the MLMA in Fish and Game Code Section 7073(b)(2) and the 2018 Master Plan, is developing a prioritized list of species for more focused management. Species prioritization is intended to focus scaled-management efforts, including fishery management plans (FMPs), on fisheries that DFW determines have the greatest need for changes in conservation and management measures, and to maximize resources and ecosystem benefits.

For the prioritization process laid out in the 2018 Master Plan, all fisheries go through two risk assessments to identify and evaluate ecological and/or biological risks posed by fishing: a productivity susceptibility analysis (PSA), which assesses the risks to a particular stock, and an ecological risk assessment (ERA), which assesses the risk a fishery poses to the ecosystem.

DFW drafted an interim priority list in 2018 for 45 state-managed fisheries based on the results of the PSA. The priority list was identified as interim until a refined ERA tool was developed and could also be applied to further prioritize management attention (Exhibit 2).

Today DFW staff will give a presentation on the prioritization process for key California fisheries, including the status of conducting ERAs, and discuss how this prioritization may inform scaled management measures, including FMP development (Exhibit 3).

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

Following public discussion, develop a recommendation for FGC related to completing ERAs for the remaining 13 species in the interim priority list, and on MLMA prioritization results.

STAFF SUMMARY FOR NOVEMBER 5, 2019

**Exhibits**

1. [Staff summary for Agenda Item 5, Jul 11, 2019 MRC meeting \(for background only\)](#)
2. [2018 Master Plan, Chapter 2 - Prioritizing Management Efforts](#)
3. [DFW presentation](#)

**Committee Direction/Recommendation**

The Marine Resources Committee recommends that the Department continue efforts to complete ERA assessments for the 13 remaining species and to complete the draft prioritization list for further discussion.

## COMMITTEE STAFF SUMMARY FOR NOVEMBER 5, 2019

**6. KELP AND ALGAE COMMERCIAL HARVEST REGULATIONS****Today's Item**Information Direction 

Receive DFW update on progress in developing proposed changes to commercial kelp and marine algae harvest regulations.

**Summary of Previous/Future Actions**

- |   |                                     |
|---|-------------------------------------|
| • FGC approved 3-phase approach for kelp review   | Jun 20, 2012; Mammoth Lakes         |
| • FGC adopted Phase 1 kelp regulations            | Nov 6, 2013; La Quinta              |
| • MRC reviewed approach to next regulation phases | Nov 4, 2015; MRC, Ventura           |
| • FGC approved revised 3-phase approach           | Dec 9, 2015; San Diego              |
| • MRC update on new Phase 2 regulation review     | Nov 15, 2016; MRC, Los Alamitos     |
| • Update on regulation review                     | Mar 6, 2018; MRC, Santa Rosa        |
| • Update on regulation review                     | Jul 11, 2019; MRC, San Clemente     |
| • <b>Today's update on regulation review</b>      | <b>Nov 5, 2019; MRC, Sacramento</b> |

**Background**

Kelp, an important biogenic habitat, is managed along with other marine algae through DFW's kelp management program. In Jun 2012, FGC and DFW agreed to a three-phase approach to revise antiquated commercial kelp regulations over several years, to improve management and enforceability. Phase 1 was completed in 2013 and implemented in 2014. As part of Phase 2, DFW has focused on both regulatory clean-up and broader management and regulation overhaul. Most recently, DFW gave process updates in Mar 2018 and Jul 2019. (See exhibit 1 for additional background.)

Today, DFW will present an overview of the types of regulatory changes proposed for the Phase 2 rulemaking and highlight a potential rulemaking timeline for consideration (Exhibit 2).

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

Provide feedback on a potential rulemaking timeline that allows for FGC's Tribal Committee (Jan 2020) and MRC (Mar 2020) to review a more detailed regulation change proposal and make recommendations to FGC in advance of rulemaking documents being completed for FGC consideration.

**Exhibits**

1. [Staff summary for Jul 11, 2019 MRC meeting, Agenda Item 6 \(for background purposes only\)](#)
2. [DFW presentation, Oct 22, 2019](#)

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

## COMMITTEE STAFF SUMMARY FOR NOVEMBER 5, 2019 MRC

**7. RED ABALONE FISHERY MANAGEMENT PLAN (FMP)**

<b>Today's Item</b>	<b>Information</b> <input checked="" type="checkbox"/>	<b>Action</b> <input type="checkbox"/>
---------------------	--	--

Receive update on collaborative progress to complete a red abalone FMP.

**Summary of Previous/Future Actions**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• FGC supported red abalone FMP development per MRC recommendation</li> </ul>  | <p>Oct 8, 2014; Mt. Shasta</p>             |
| <ul style="list-style-type: none"> <li>• DFW updates to MRC on FMP process</li> </ul>                                 | <p>2015-2017; MRC meetings</p>             |
| <ul style="list-style-type: none"> <li>• FGC discussed FMP scope and content</li> </ul>                               | <p>Dec 2017-2018; various</p>              |
| <ul style="list-style-type: none"> <li>• Received peer review results for draft FMP and re-referred to MRC</li> </ul> | <p>Oct 17, 2018; Fresno</p>                |
| <ul style="list-style-type: none"> <li>• MRC discussed revised FMP process</li> </ul>                                 | <p>Nov 14, 2018; MRC, Sacramento</p>       |
| <ul style="list-style-type: none"> <li>• FGC supported revised process per MRC recommendation</li> </ul>              | <p>Dec 11-12, 2018; Oceanside</p>          |
| <ul style="list-style-type: none"> <li>• DFW update to MRC on FMP process</li> </ul>                                  | <p>Jul 11, 2019; MRC, San Clemente</p>     |
| <ul style="list-style-type: none"> <li>• <b>Today's update</b></li> </ul>   | <p><b>Nov 5, 2019; MRC, Sacramento</b></p> |

**Background**

A red abalone FMP has been under development by DFW since 2014, with regular updates to MRC and FGC. Since late 2018, following MRC recommendation and FGC support, attention has focused on a revised FMP development structure. The intent is to (1) support integrating aspects of two draft management strategies using a simulation modeling approach co-developed by DFW and The Nature Conservancy (TNC)-led stakeholder team, (2) develop a *de minimis* fishery option with defined triggers, and (3) integrate increased stakeholder involvement. For a more detailed background on the process, see exhibits 1-3.

In Mar 2019, DFW introduced a collaborative structure designed to support management strategy integration and public involvement as requested by FGC. The structure includes three collaborative teams: an administrative team, a modeling team, and a project team; using this structure, an integrated draft management strategy was developed.

Four project team meetings (two webinars and two in-person) designed to generate ideas and solicit feedback took place from May through Oct 2019. Based on feedback from these meetings, the modeling team revised the integrated draft management strategy and solicited a second round of feedback. The administrative team continues to support the collaborative process structure and work with both the project and modeling teams to ensure collaboration. The final project team meeting will occur in Nov or Dec of 2019.

Today, MRC will receive a presentation from DFW and TNC staff on the updated project timeline, an overview of modeling team discussions to date, and a summary of comments on proposals received through the project team process.

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

COMMITTEE STAFF SUMMARY FOR NOVEMBER 5, 2019 MRC

**Recommendation (N/A)**

**Exhibits**

1. [Staff summary for Oct 17, 2018 FGC meeting, Agenda Item 11 \(for background purposes only\)](#)
2. [Staff summary for Nov 14, 2018 MRC meeting, Agenda Item 5 \(for background purposes only\)](#)
3. [Staff summary for Jul 11, 2019 MRC meeting, Agenda Item 4 \(for background purposes only\)](#)

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

## STAFF SUMMARY FOR NOVEMBER 5, 2019

**8. KELP RESTORATION AND RECOVERY EFFORTS****Today's Item**Information Action 

Update on the development of kelp restoration strategies, including purple urchin removal experiments conducted in collaboration with interested stakeholders.

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

At its Oct 2019 meeting, following public comment and discussion regarding observed declines in kelp forest canopy and the notable increase in purple urchin populations, FGC referred to MRC a discussion on kelp recovery and restoration efforts, including purple urchin management strategies.

Kelp is an ecologically and economically important biogenic habitat managed by DFW. Significant declines in the statewide kelp forest canopy have been observed by managers since 2014. The declines have largely been driven by changing oceanographic conditions, such as warmer temperatures, and ecological stressors, including a decline in sea star populations and significant increases in purple urchin populations. Losses in kelp have also contributed to declining abalone populations weakened by the same changing oceanographic conditions and outcompeted by purple urchins for its food source (kelp).

In an effort to increase overall kelp canopy coverage and health, stakeholders and managers have been exploring avenues to reduce purple urchin populations. In May 2018, FGC took emergency action to increase the daily bag limit for the recreational take of purple urchin to 20 gallons by hand while diving; in Oct 2018, FGC adopted a regular rulemaking that authorizes up to 40 gallons per day. Many stakeholders requested to smash urchins in place rather than harvesting them; however, FGC and DFW have emphasized that under Fish and Game Code Section 7704, take may not be wasted and, therefore, smashing purple urchins rather than harvesting for utilization is in violation of code. DFW has been working with partners to permit and monitor controlled purple urchin removal experiments and to identify ways that harvested purple urchin can be effectively utilized.

For today's discussion, DFW will provide a presentation on kelp restoration and recovery efforts that have been undertaken or are planned by a wide range of partners and DFW; efforts include possible additional purple urchin removal experiments in collaboration with interested stakeholders, and the development of a statewide kelp restoration toolkit (Exhibit 1).

**Significant Public Comments**

1. An update from Reef Check California on results of an urchin removal experiment conducted in the Monterey area under a DFW-approved scientific collecting permit, and will present its update during the meeting (Exhibit 2).
2. Comment and link from a commercial diver representing a California State University at Chico diving organization, discussing a modified air lift developed to remove purple urchins and seeking assistance with securing funding to continue the work (Exhibit 3).

STAFF SUMMARY FOR NOVEMBER 5, 2019

**Recommendation (N/A)**

**Exhibits**

1. [DFW presentation](#)
2. [Email and presentation from Reef Check on urchin removal experiments along the central coast, received Oct 23, 2019](#)
3. [Email from Jon Holcomb with link to video, received Oct 8, 2019](#)

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

## STAFF SUMMARY FOR NOVEMBER 5, 2019

**9. WHALE AND TURTLE PROTECTIONS – RECREATIONAL DUNGENESS CRAB FISHERY****Today's Item**Information Action 

Discuss and consider possible recommendations for management strategies to provide additional whale and turtle protections in the recreational Dungeness crab fishery.

**Summary of Previous/Future Actions**

- FGC discussed entanglement settlement and referral to MRC Apr 17, 2019; Santa Monica
- MRC discussed possible management measures for the recreational fishery Jul 11, 2019; MRC, San Clemente
- FGC supported considering recreational measures per MRC recommendation Aug 7-8, 2019; Sacramento
- **Today's discussion** Nov 5, 2019; MRC, Sacramento

**Background**

FGC has authority to regulate the recreational Dungeness crab fishery; however, authority over the commercial Dungeness crab fishery is held by DFW and the California State Legislature. In recent years, whale populations in California's waters have increased, leading to greater presence in Dungeness crab fishing grounds and an increased risk of entanglement in deployed fishing gear.

In 2017, the Center for Biological Diversity sued DFW, challenging DFW authorization of the commercial Dungeness crab fishery as a violation of Section 9 of the federal Endangered Species Act for take of blue and humpback whales and leatherback sea turtles. In Mar 2019 a settlement was reached that defines a series of interim measures to protect listed whales and turtles in the commercial Dungeness crab fishery while DFW pursues a habitat conservation plan (HCP) for federal government approval Exhibits 1 and 2 provide additional background.

At the Apr 2019 FGC meeting, a discussion was held to recap the provisions of the commercial fishery settlement agreement and explore its potential application to the recreational Dungeness crab fishery. After hearing differing public comment and multiple stakeholder requests, FGC referred the topic to the Jul 2019 MRC meeting for further discussion and to explore the potential need for provisions in the recreational Dungeness crab fishery.

In Jul 2019, MRC received a DFW update on management strategies and the HCP application process, and initiated a discussion on the risk of and potential response to entanglements from the recreational fishery. As a result of the discussion, MRC recommended, and in Aug 2019 FGC approved, a request that DFW explore inclusion of the recreational crab fishery in DFW's commercial crab fishery HCP application, including a suite of common-sense management measures.

At this meeting, DFW will present management strategies that provide additional whale and turtle protection in the recreational Dungeness crab fishery, including six measures for possible application to the recreational crab fishery for MRC discussion and consideration (Exhibit 3).

## STAFF SUMMARY FOR NOVEMBER 5, 2019

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

Support development of a rulemaking for management measures in the recreational Dungeness crab fishery, considering recommendations provided by DFW and through public comments during the meeting.

**Exhibits**

1. [Staff summary for July 11, 2019 MRC meeting, Agenda Item 9 \(for background purpose only\)](#)
2. [Staff summary for Apr 10-11, 2019 FGC meeting, Agenda Item 25 \(for background purposes only\)](#)
3. [DFW presentation](#)

**Motion/Direction**

The Marine Resources Committee recommends that the Commission support six proposed management measures for the recreational Dungeness crab fishery as recommended by the Department to minimize the risk of whale and turtle entanglements.

OR

The Marine Resources Committee recommends that the Commission support six proposed management measures for the recreational Dungeness crab fishery as recommended by the Department to minimize the risk of whale and turtle entanglements, except \_\_\_\_\_.

## COMMITTEE STAFF SUMMARY FOR NOVEMBER 5, 2019 MRC

**10. COASTAL FISHING COMMUNITIES PROJECT****Today's Item**Information Action 

Receive staff update on FGC's Coastal Fishing Communities Project, potentially recommend adopting the draft final staff synthesis report as final, and discuss next steps.

**Summary of Previous/Future Actions**

- |   |                                     |
|---|-------------------------------------|
| • FGC referred 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                                      | Jul 11, 2019; MRC, San Clemente     |
| • <b>Today's update and adoption of report and definition</b> | <b>Nov 5, 2019; MRC, Sacramento</b> |

**Background**

An MRC project under FGC direction, the Coastal Fishing Communities Project has been underway since 2015. FGC 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 coastal fishing communities (visit <https://fgc.ca.gov/Committees/Marine/Coastal-Fishing-Communities-Project> for details.).

FGC staff synthesized input from the community meetings into key themes and provided its *Staff Report on California Coastal Fishing Communities* to MRC in Jul 2018. Following a public comment period and additional discussion with MRC in Nov 2018, FGC approved an MRC recommendation for staff to incorporate stakeholder comments into a revised staff report. Exhibits 1-3 provide additional background information on the project.

In Jul 2019, FGC staff submitted a revised staff report to MRC (Exhibit 4). After in-meeting discussion, MRC requested staff to (1) post the final revised synthesis report online to allow for stakeholder review; and (2) work with stakeholders to develop a working draft definition for the term "coastal fishing community" for use within the project. The draft final revised report was posted to the FGC website and no additional comments have been received.

For the coastal fishing community definition, staff scheduled a work session with interested stakeholders on Oct 18 to develop a draft definition. Over a dozen stakeholders participated and worked together to develop a draft "coastal fishing community" definition.

Today, staff will present an overview of the Oct 18 work session, the draft coastal fishing community definition developed during the work session, and proposed revisions to the draft definition submitted by a sub-group of stakeholders for MRC discussion and possible recommendation (Exhibit 5). Staff will also highlight additional updates and possible next steps.

## COMMITTEE STAFF SUMMARY FOR NOVEMBER 5, 2019 MRC

**Significant Public Comments**

1. A sub-group of five work session participants representing harbor and commercial fishing interests (Mike Conroy, Peter Flournoy, Steve Scheiblaue, Diane Pleschner-Steele and Bob Bertelli) proposed a revised version of the draft definition developed during the work session, and include rationale for the proposed changes (in Exhibit 5).
2. The Congressional Sportsmen's Foundation expressed opposition to the term "harvesters" as a defining term for "coastal fishing community" as it may exclude some recreational anglers (Exhibit 6).
3. Representatives of Heal the Bay, Ocean Conservancy, American Sportfishing Association, and a harbor representative sent emails to FGC staff expressing support for the definition developed in the work session and expressing concerns that the revised version submitted by a sub-group (in Exhibit 5) was overly exclusionary.
4. Seven people, including fishermen and representatives of organizations advocating for fishermen, sent emails to FGC staff in support of the revised definition submitted by a sub-group on Oct 23, 2019 (in Exhibit 5).

**Recommendation**

- (A) Recommend FGC adopt the *Staff Synthesis Report on California Coastal Fishing Communities Meetings* (Jul 2019) as complete and final.
- (B) Discuss draft definition(s) of coastal fishing community and make a recommendation to FGC regarding possible adoption.
- (C) Discuss prioritizing the recommendations outlined in the final staff report and provide input on where to focus staff efforts as a more in-depth analysis and reporting ensues with stakeholders and other partners.

**Exhibits**

1. [Staff summary from Nov 4, 2015 MRC meeting \(for background purposes only\)](#)
2. [Staff summary from Nov 11, 2018 MRC meeting \(for background purposes only\)](#)
3. [Staff summary from Jul 11, 2019 MRC meeting \(for background purposes only\)](#)
4. Draft final staff synthesis report on 2017-2018 California coastal community meetings, Jul 2019 (available at: <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=174088&inline>)
5. [Draft definition of "coastal fishing community" from a stakeholder work session held Oct 18, 2019, and proposed edits submitted by a stakeholder sub-group on Oct 23, 2019 and a revised version submitted on Oct 28, 2019](#)
6. [Email and attached letter from Aoibheann Cline, Western States Coordinator, Congressional Sportsmen's Foundation, received Oct 23, 2019](#)

**Committee Direction/Recommendation**

Develop a committee recommendation based on the staff recommendations and discussion during the meeting.

## COMMITTEE STAFF SUMMARY FOR NOVEMBER 5, 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 Oct 9-10, 2019; Valley Center
- **Today's discussion** **Nov 5, 2019; MRC, Sacramento**
- Next meeting Mar 17, 2020; MRC, Monterey Area

**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 Mar 2020 MRC meeting include:

1. Update on MLMA master plan for fisheries implementation
2. Update and possible recommendation on red abalone fishery management plan
3. Update on Experimental Fishing Permit Phase II rulemaking
4. Update and possible recommendation on kelp and marine algae commercial harvest rulemaking
5. Update on state water bottom leases issued for aquaculture: existing and future lease considerations
6. Update on whale and turtle protections in managing the Dungeness crab fisheries
7. Stakeholder informational presentation on aspects of state commercial fisheries management not under FGC regulatory authority (deferred from Nov MRC meeting)
8. Update on cowcod rockfish recovery (added by FGC in Oct)

***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)**

COMMITTEE STAFF SUMMARY FOR NOVEMBER 5, 2019

**Recommendation**

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

**Exhibits**

1. [MRC work plan, dated Oct 23, 2019](#)
2. [FGC perpetual timetable for regulatory actions, dated Oct 10, 2019](#)

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

---

**From:** Erin Seghesio - NOAA Federal <erin.seghesio@noaa.gov>  
**Sent:** Friday, October 18, 2019 8:00 AM  
**To:** Erin Seghesio  
**Subject:** Recovering Threatened and Endangered Species FY 2017-2018  
**Attachments:** Recovering\_threatened-and-endangered-species-web.pdf

Hello,

NOAA Fisheries announced the availability of the latest comprehensive report on *Recovering Threatened and Endangered Species FY 2017-2018* <https://www.fisheries.noaa.gov/feature-story/recovering-threatened-and-endangered-species-report-congress-2017-2018>. The Endangered Species Act provides a critical safety net. We are beginning to see the success of our efforts, with a number of species recently found to be recovered, but more work needs to be done.

All of our species listed under the ESA are valuable and vulnerable. We are seeing results from the Species in the Spotlight initiative, which was initiated by the agency in 2015. In this year's report, we added the North Atlantic Right Whale to the Species in the Spotlight. The species is extremely endangered and fisheries gear entanglements and vessel strikes are among the leading causes of mortalities in both the U.S. and Canada.

Central California Coast (CCC) Coho Salmon is one of the nine species in the Species in the Spotlight Initiative. In the report, you will find an update on some of the most critical actions that are being taken towards their recovery.

We are recognizing our *Species in the Spotlight Partners* for their incredible conservation efforts. The CCC coho salmon Spotlight Partner is the *Russian River Coho Salmon Hatchery Team, formed of the U.S. Army Corps of Engineers and California Department of Fish and Wildlife*. They have played a critical role in coho salmon recovery. Since 2001, the Team has been committed to coho recovery by rescuing stranded salmon and expanding operations to meet recovery needs. As a result, the Russian River coho salmon populations were saved from local extinction and abundance has grown from the 10s to over 100s of fish.

Thank you,

Erin Seghesio

-please forward to anyone who may interested

--

**Erin Seghesio**  
*Recovery Coordinator/Fishery Biologist*  
NOAA Fisheries  
West Coast Region

tel: 707-578-8515

[Erin.Seghesio@noaa.gov](mailto:Erin.Seghesio@noaa.gov)

web: <http://www.westcoast.fisheries.noaa.gov>



**NOAA**  
**FISHERIES**

# Recovering Threatened and Endangered Species

## FY 2017 - 2018 Report to Congress



# Recovering Threatened and Endangered Species

## FY 2017-2018 Report to Congress

**U.S. DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Office of Protected Resources**



**NOAA  
FISHERIES**

**Recommended Citation:**

National Marine Fisheries Service. 2019. Recovering Threatened and Endangered Species, FY 2017 - 2018 Report to Congress. National Marine Fisheries Service. Silver Spring, MD.

**Copies of this report may be obtained from:**

Office of Protected Resources – F/PR3  
National Marine Fisheries Service  
1315 East-West Highway  
Silver Spring, MD 20910-3226

**Or online at:**

<https://www.fisheries.noaa.gov/national/endangered-species-conservation/recovery-species-under-endangered-species-act#how-do-we-know-if-we're-making-progress>

**Cover Photo Credits:**

Leatherback turtle: Scott Benson, NMFS  
Monk Seal: NOAA  
Abalone: Cabrillo Marine Aquarium  
CCC Coho: Ben White, Army Corps of Engineers



Photo Credit: Ben White Army Corps of Engineers

## Contents

List of Acronyms	6
Letter from the Assistant Administrator	8
Background	10
Overview	12
Table 1: ESA-Listed Species Under NMFS Jurisdiction	22
Atlantic Salmon Gulf of Maine	24
Central California Coast Coho Salmon ESU	32
Cook Inlet Beluga Whale DPS	42
Hawaiian Monk Seal	52
North Atlantic Right Whale	62
Pacific Leatherback Sea Turtles	70
Sacramento River Winter-Run Chinook Salmon ESU	78
Southern Resident Killer Whale	88
White Abalone	98

# LIST OF ACRONYMS

<b>ADF&amp;G</b>	Alaska Department of Fish & Game
<b>AFR</b>	Age at First Reproduction
<b>ASF</b>	Atlantic Salmon Federation
<b>BOEM</b>	Bureau of Ocean Energy Management
<b>BOR</b>	U.S. Bureau of Reclamation
<b>CDFW</b>	California Department of Fish and Wildlife
<b>CDWR</b>	California Department of Water Resources
<b>COE</b>	U.S. Army Corps of Engineers
<b>DLNR</b>	Hawaii Department of Land and Natural Resources
<b>DPS</b>	Distinct Population Segment
<b>ESA</b>	Endangered Species Act of 1973
<b>ESU</b>	Evolutionarily Significant Unit
<b>FWS</b>	U.S. Fish and Wildlife Service
<b>HGMP</b>	Hatchery Genetic Management Plan
<b>IAC</b>	Inter-American Convention for the Protection and Conservation of Sea Turtles
<b>IATTC</b>	InterAmerican Tropical Tuna Convention
<b>NARWC</b>	North Atlantic Right Whale Consortium
<b>NASCO</b>	North Atlantic Salmon Conservation Organization
<b>NFWF</b>	National Fish and Wildlife Foundation
<b>NGO</b>	Non-Governmental Organizations
<b>NMFS</b>	National Marine Fisheries Service

<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NOAA RC</b>	NOAA Restoration Center
<b>PCSRF</b>	Pacific Coastal Salmon Recovery Fund
<b>PIFSC</b>	Pacific Islands Fisheries Science Center
<b>ROV</b>	Remotely Operated Vehicle
<b>SCUBA</b>	Self-Contained Underwater Breathing Apparatuses
<b>SWFSC</b>	NMFS Southwest Fisheries Science Center
<b>TLC</b>	Time-Lapse Cameras
<b>TNC</b>	The Nature Conservancy
<b>WCPF</b>	Western Central Pacific Fisheries Commission
<b>WDFW</b>	Washington Department of Fish and Wildlife
<b>WWF</b>	World Wildlife Fund for Nature



Photo Credit: Robert Frankovich



**NOAA  
FISHERIES**

## Letter from the Assistant Administrator

Almost a half-century has passed since the enactment of the Endangered Species Act (ESA), which President Nixon signed into law on December 28, 1973. Congress passed the legislation recognizing that the natural heritage of the United States was of “esthetic, ecological, educational, recreational, and scientific value to our Nation and its people.” They understood that, without protection from human actions, many of our nation’s living resources would become extinct. In implementing the ESA, we continue to assess its regulatory framework and clarify procedures as appropriate. NOAA Fisheries and the US Fish and Wildlife Service recently revised joint ESA implementing regulations pertaining to the classification of species and the designation of critical habitat for listed species (Title 50 Part 424 of the Code of Federal Regulations). The revision was a part of our efforts to achieve the goals of Executive Order 13777, “Enforcing the Regulatory Reform Agenda,” which directs federal agencies to review existing regulations, identify those that meet specific review criteria and make recommendations regarding leaving regulations as they are, or recommending their repeal, replacement or modification. These regulatory revisions are meant to clarify and interpret the procedures and criteria used for listing or removing species from the Lists of Endangered and Threatened Wildlife and Plants and designating critical habitat.



This biennial report to Congress highlights the important work of recovering marine species so that they no longer need the protections of the ESA and can be delisted. In this biennial report, we also continue to highlight the Species in the Spotlight initiative created in 2015. NOAA Fisheries launched the initiative to focus our resources on our most imperiled marine species and expand partnerships to help recover these species. Through an organized outreach strategy, we have expanded the support of the American public to address immediate needs to help stabilize the declining populations of eight endangered species identified as the most at risk of extinction in the near future. Since the initiative’s inception, we have seen remarkable progress toward recovering these eight species through focused research initiatives and management actions. The Species in the Spotlight stories are contained in this report and capture noteworthy accomplishments over the past two years. For example, we highlight the successful production of viable white abalone broodstock that has increased by several orders of magnitude—from thousands to millions over the past two years—and the partners who have made it happen, including the University of California Davis Bodega Marine Laboratory and Amanda Bird from the Paua Marine Research Group.

In the last biennial report, I raised the question about considering the North Atlantic right whale as a Species in the Spotlight. The North Atlantic right whale is one of the world’s most endangered large whale species, with only an estimated 411 individuals remaining at the end of 2017. In the late 1990s and early 2000s, there were positive signs that this species was recovering. Since 2010, however, the best scientific information indicates the species has been declining. Additionally, in 2017, nearly four percent of the species died, with most of the deaths observed in Canadian waters. The species faces the continued threat of human-caused mortality primarily due to lethal interactions with commercial fisheries and shipping traffic. We are still uncertain what the

long-term effect entanglements and other environmental stressors may have in limiting right whale calving and recovery. Because of these developments in the North Atlantic right whale status and threats, I am announcing its inclusion as the 9th Species in the Spotlight. We are developing a five-year priority actions plan with input from an expanded coast-wide U.S. Right Whale Recovery Plan Implementation Team. The Team will be convened in 2019 to focus on priority cross-regional recovery actions for this species. Key actions that build off the recovery plan for the North Atlantic Right Whale will be identified in the five-year priority actions plan, and we will report on progress on those actions in the next Biennial report. A story on the North Atlantic right whale is included in this biennial report.

The Species in the Spotlight initiative is an excellent example of how focused efforts around a common cause can advance recovery. However, we acknowledge and continue to advance the recovery of all the marine species under our purview. These species are of great interest to the public and represent a vital part of a healthy marine ecosystem. The ESA is designed to protect both species and their habitat and aspires to create a world of intact ecosystems. Many communities rely on marine ecosystems for their livelihoods, such as fishing and tourism. We are dedicated to all of the species and the ecosystems upon which they depend that Congress bestowed to us the honor of protecting and conserving.

**Chris Oliver**  
Assistant Administrator for Fisheries



Photo Credit: NMFS



**NOAA**  
**FISHERIES**

## Background

Primary purposes of the ESA, as amended (16 United States Code sections 1531–1544) are the conservation of endangered and threatened species and the ecosystems on which they depend. Conservation is defined as “...the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary.” As one means of achieving recovery, the ESA requires the development of recovery plans for listed endangered or threatened species (except those species for which it is determined that such a plan will not promote the conservation of the species). Recovery plans organize and guide the recovery process.

We monitor recovery progress by conducting a review of the species status at least once every five years (five-year review) to determine, on the basis of such review, whether the species should be reclassified or removed from the list (ESA section 4(c)(2)).

The ESA amendments of 1988 added a requirement that the Secretaries of Commerce and the Interior report to Congress every two years on the status of efforts to develop and implement recovery plans, and on the status of all species for which recovery plans have been developed (ESA section 4(f)(3)). The Secretary of Commerce has delegated responsibility for endangered and threatened species recovery to the National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA). This is the 15th Report to Congress on the status of the recovery program for these species.

Photo Credit: Autumn Sutherland



## Overview



Photo Credit: Azores B. Skerry

Recovery is the process of restoring listed species to the point they no longer require the protections of the ESA. A recovery plan serves as a road map for species recovery—it lays out where to go and how to get there. Without a plan to organize, coordinate, and prioritize recovery actions, the efforts by so many agencies, non-profit organizations, tribal entities, stakeholders, and citizens may be inefficient, ineffective, or misdirected. Recovery plans are guidance documents, not regulatory, and the ESA clearly envisions recovery plans as the central organizing tool guiding each species' progress toward recovery.

This report summarizes efforts to recover all domestic and transnational species under NMFS' jurisdiction from October 1, 2016, through September 30, 2018. It includes a summary table (Table 1) outlining the status of each species, the status of the recovery plan, and the date the last five-year review was completed.

With this report, NMFS is updating progress made on the Species in the Spotlight initiative launched in 2015. The initiative is a strategic approach to endangered species recovery that focuses agency resources on species for which immediate, targeted efforts are needed to stabilize their populations and prevent extinction. This report highlights progress made on recovery efforts for the eight species originally identified in the Species in the Spotlight and the North Atlantic right whale, which was added to the initiative in 2019. These species are notable because the best available information points to their extinction in the near future because of rapid population decline or habitat destruction. They need focused human intervention to stabilize their population declines and prevent their extinction.

During the two years covered in this report (October 1, 2016 – September 30, 2018), the number of listed species under NMFS jurisdiction increased 10 percent. During that period, we managed 97 domestic (includes some transnational) species of salmon, sturgeon, sawfish, seagrass, mollusks, sea turtles, corals, and marine mammals, and 66 foreign species. In January 2017, NMFS delisted the distinct population segment (DPS) of the canary rockfish (*Sebastes pinniger*) due to new genetic analysis indicating the population did not meet the DPS criteria; thus, the listing was in error. In this report, we address the 90 species for which recovery plans have been or will be developed, including two newly listed transnational species<sup>1</sup>:

- Giant Manta Ray (*Manta birostris*) listed as threatened on January 22, 2018 (83 FR 2916)
- Oceanic Whitetip Shark (*Carcharhinus longimanus*) listed as threatened on January 30, 2018 (83 FR 4153).

Between October 1, 2016, and September 30, 2018, of the 90 domestic or transnational listed species for which a recovery plan would promote their conservation, 54 had final recovery plans, 2 had a draft recovery plan, 25 plans were in development, and 9 species recovery plans had not been started.

Between October 1, 2016, and September 30, 2018, the status of the 90 endangered or threatened species for which recovery plans have been or will be developed was:

- 27 (30%) were stabilized or increasing.
- 18 (20%) were declining.
- 9 (10%) were mixed, with their status varying by population location.
- 36 (40%) were unknown, because we lacked sufficient trend data to make a determination.

A list of the domestic and transnational species managed by NMFS for which recovery plans have been or will be developed (90 species) is provided in Table 1. For each species, subspecies, evolutionarily significant unit (ESU), or DPS, the table lists the population trend (unknown, decreasing, mixed, stable, or increasing), the status of the recovery plan, and the date the last five-year review was completed. Table 1 also includes the recovery priority number, which indicates NMFS' priorities for recovery plan preparation and implementation (April 30, 2019; 84 FR 18243). Additional information on these species is available online at <http://www.fisheries.noaa.gov/species-directory/threatened-endangered>.

Recovery plans are available online at [https://www.fisheries.noaa.gov/resources/documents?title=&field\\_category\\_document\\_value%5B%5D=recovery\\_plan%5D=recovery\\_plan&sort\\_by=created](https://www.fisheries.noaa.gov/resources/documents?title=&field_category_document_value%5B%5D=recovery_plan%5D=recovery_plan&sort_by=created)

Recovery plans may also be requested by writing to:

Endangered Species Division – Recovery Plans  
Office of Protected Resources – F/PR3  
National Marine Fisheries Service  
1315 East-West Highway  
Silver Spring, MD 20910-3226

This report is available online via the NMFS Office of Protected Resources website at <https://www.fisheries.noaa.gov/feature-story/endangered-species-biennial-report-2017-2018>

---

<sup>1</sup> The ESA defines a species to include any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.

## Table 1: ESA Listed Species Under NMFS Jurisdiction

ESA-listed species under NMFS jurisdiction through September 30, 2018, where recovery plans are either complete, in progress, or planned. Information includes the listing status, population trend, recovery priority number, recovery plan status, and 5-year review completion.

Species Subspecies ESU/DPS	Date Listed Reclassified	ESA Status	Trend	Recovery Priority Number <sup>1</sup>	Status of Recovery Plan	Date 5-Year Status Review Completed <sup>2</sup>
<b>SEA TURTLES</b>						
<b>Hawksbill Sea Turtle</b>	06/1970	E	Mixed	3C	Completed 01/1998 (Pacific); 12/1993 (Atlantic)	06/2015
<b>Kemp's Ridley Sea Turtle</b>	12/1970	E	Unknown	1C	Completed 08/1992: Revision Completed 09/2011	07/2015
<b>Leatherback Sea Turtle</b>	06/1970	E	Mixed	3C	Completed 01/1998 (Pacific); 04/1992 (Atlantic)	11/2013; Full status review Initiated 12/2017
<b>GREEN SEA TURTLE</b>						
Central North Pacific DPS	07/1978: 04/2016	T	Unknown	3C	1978 Listing: Completed 01/1998 (Pacific); 10/1991 (Atlantic); 2016 Listing: Not Started	03/2015
Central West Pacific DPS	07/1978: 04/2016	E	Unknown	3C	1978 Listing: Completed 01/1998 (Pacific); 10/1991 (Atlantic); 2016 Listing: Not Started	03/2015
Central South Pacific DPS	07/1978: 04/2016	E	Unknown	3C	1978 Listing: Completed 01/1998 (Pacific); 10/1991 (Atlantic); 2016 Listing: Not Started	03/2015
South Atlantic DPS	07/1978: 04/2016	T	Mixed	5C	1978 Listing: Completed 01/1998 (Pacific); 10/1991 (Atlantic); 2016 Listing: Not Started	03/2015

Species Subspecies ESU/DPS	Date Listed Reclassified	ESA Status	Trend	Recovery Priority Number <sup>1</sup>	Status of Recovery Plan	Date 5-Year Status Review Completed <sup>2</sup>
East Pacific DPS	07/1978; 04/2016	T	Mixed	5C	1978 Listing: Completed 01/1998 (Pacific); 10/1991 (Atlantic); 2016 Listing: Not Started	03/2015
North Atlantic DPS	07/1978; 04/2016	T	Increasing	5C	1978 Listing: Completed 01/1998 (Pacific); 10/1991 (Atlantic); 2016 Listing: Not Started	03/2015
<b>LOGGERHEAD SEA TURTLE</b>						
Northwest Atlantic Ocean DPS	07/1978; 09/2011	T	Stable	3C	Completed 12/1991; Revision Completed 01/2009	08/2009 (Full status review); 5-Year Review Initi- ated 10/2016
North Pacific Ocean DPS	07/1978; 09/2011	E	Stable	5C	Completed 01/1998; Revision Under Development	08/2009 (Full status review); 5-Year Review Initi- ated 10/2016
<b>OLIVE RIDLEY SEA TURTLE</b>						
Breeding colony populations of Pacific coast Mexico	07/1978	E	Stable	5C	Completed 01/1998	06/2014
Rangewide	07/1978	T	Mixed	5C	Completed 01/1998	06/2014

Species Subspecies ESU/DPS	Date Listed Reclassified	ESA Status	Trend	Recovery Priority Number <sup>1</sup>	Status of Recovery Plan	Date 5-Year Status Review Completed <sup>3</sup>
<b>PACIFIC SALMON</b>						
<b>CHINOOK</b>						
Chinook, Puget Sound ESU	03/1999; 06/2005 <sup>3</sup>	T	Stable	3C	Completed 01/2007	05/2016
Chinook, Lower Columbia River ESU	06/2005 <sup>3</sup>	T	Stable	3C	Completed 07/2013	05/2016
Chinook, Upper Columbia River, Spring-run ESU	03/1999; 06/2005 <sup>3</sup>	E	Stable	1C	Completed 10/2007	05/2016
Chinook, Snake River Fall-run ESU	04/1992; 06/2005 <sup>3</sup>	T	Increasing	5C	Completed 12/2017	05/2016
Chinook, Snake River Spring/Summer-run ESU	04/1992; 06/2005 <sup>3</sup>	T	Stable	3C	Completed 12/2017	05/2016
Chinook, Upper Willamette River ESU	03/1999; 06/2005 <sup>3</sup>	T	Decreasing	3C	Completed 08/2011	05/2016
Chinook, California Coastal ESU	09/1999; 06/2005 <sup>3</sup>	T	Unknown	3C	Completed 10/2016	05/2016
Chinook, Central Valley Spring-run ESU	09/1999; 06/2005 <sup>3</sup>	T	Stable	3C	Completed 07/2014	05/2016
Chinook, Sacramento River Winter-run ESU	11/1990; 1/1994 <sup>4</sup> ; 06/2005 <sup>3</sup>	E	Stable	1C	Completed 07/2014	12/2016
<b>CHUM</b>						
Chum, Hood Canal Summer-run ESU	03/1999; 06/2005 <sup>3</sup>	T	Increasing	5C	Completed 05/2007	05/2016
Chum, Columbia River ESU	03/1999; 06/2005 <sup>3</sup>	T	Stable	3C	Completed 07/2013	05/2016
<b>COHO</b>						
Coho, Lower Columbia River ESU	03/1999; 06/2005 <sup>3</sup>	T	Stable	4C	Completed 07/2013	05/2016

Species Subspecies ESU/DPS	Date Listed Reclassified	ESA Status	Trend	Recovery Priority Number <sup>1</sup>	Status of Recovery Plan	Date 5-Year Status Review Completed <sup>3</sup>
Coho, Oregon Coast ESU	08/1998 <sup>3</sup> ; 02/2008	T	Increasing	5C	Completed 12/2016	05/2016
Coho, Southern Oregon/ Northern California Coast ESU	05/1997; 06/2005 <sup>3</sup>	T	Unknown	3C	Completed 09/2014	05/2016
Coho, Central California Coast ESU	10/1996; 06/2005 <sup>3</sup>	E	Unknown	1C	Completed 09/2012	05/2016
<b>SOCKEYE</b>						
Sockeye, Ozette Lake ESU	03/1999; 06/2005 <sup>3</sup>	T	Stable	7C	Completed 05/2009	05/2016
Sockeye, Snake River ESU	11/1991; 06/2005 <sup>3</sup>	E	Increasing	1C	Completed 06/2015	05/2016
<b>STEELHEAD</b>						
Steelhead, Puget Sound DPS	05/2007	T	Stable	7C	Draft Completed 12/2018	05/2016
Steelhead, Lower Columbia River DPS	03/1998; 01/2006 <sup>3</sup>	T	Stable	3C	Completed 07/2013	05/2016
Steelhead, Upper Columbia River DPS	08/1997; 01/2006 <sup>3</sup>	T	Increasing	3C	Completed 10/2007	05/2016
Steelhead, Middle Columbia River DPS	03/1999; 01/2006 <sup>3</sup>	T	Stable	5C	Completed 09/2009	05/2016
Steelhead, Upper Willamette River DPS	03/1999; 01/2006 <sup>3</sup>	T	Decreasing	3C	Completed 08/2011	05/2016

Species Subspecies ESU/DPS	Date Listed Reclassified	ESA Status	Trend	Recovery Priority Number <sup>1</sup>	Status of Recovery Plan	Date 5-Year Status Review Completed <sup>3</sup>
<b>PACIFIC SALMON (CONTINUED)</b>						
<b>STEELHEAD</b>						
Steelhead, Snake River Basin DPS	08/1997; 01/2006 <sup>3</sup>	T	Stable	3C	Completed 12/2017	05/2016
Steelhead, Northern California DPS	06/2000; 01/2006 <sup>3</sup>	T	Unknown	3C	Completed 10/2016	05/2016
Steelhead, Central California Coast DPS	08/1997; 01/2006 <sup>3</sup>	T	Unknown	3C	Completed 10/2016	05/2016
Steelhead, South- Central California Coast DPS	08/1997; 01/2006 <sup>3</sup>	T	Unknown	3C	Completed 12/2013	05/2016
Steelhead, South- ern California Coast DPS	08/1997; 05/2002 <sup>6</sup> ; 01/2006 <sup>3</sup>	E	Unknown	1C	Completed 01/2012	05/2016
Steelhead, California Central Valley DPS	03/1998; 01/2006 <sup>3</sup>	T	Unknown	3C	Completed 07/2014	05/2016
<b>ATLANTIC SALMON</b>						
Gulf of Maine DPS	11/2000; 06/2009 <sup>7</sup>	E	Decreasing	1C	Completed 02/2019	Review Initiated 06/2017
<b>NON-SALMONID FISH</b>						
<b>Bocaccio - Puget Sound/Georgia Basin DPS</b>	04/2010; 01/2017 <sup>5</sup>	E	Decreasing	7C	Completed 10/2017	05/2016
<b>Eulachon, Southern DPS</b>	03/2010	T	Stable	9C	Completed 09/2017	05/2016
<b>Giant Manta Ray</b>	01/2018	T	Decreasing	6C	Under Development	N/A

Species Subspecies ESU/DPS	Date Listed Reclassified	ESA Status	Trend	Recovery Priority Number <sup>1</sup>	Status of Recovery Plan	Date 5-Year Status Review Completed <sup>3</sup>
<b>Green Sturgeon, Southern DPS</b>	04/2006	T	Unknown	6C	Completed 08/2018	08/2015
<b>Gulf Sturgeon</b>	09/1991	T	Mixed	7C	Completed 09/1995	Review Initiated 04/2019
<b>Nassau Grouper</b>	06/2016	T	Decreasing	3C	Under Development	N/A
<b>Oceanic Whitetip Shark</b>	01/2018	T	Decreasing	6C	Under Development	N/A
<b>Shortnose Sturgeon</b>	03/1967	E	Mixed	1C	Completed 12/1998	Not Started
<b>Smalltooth Saw- fish—U.S. DPS</b>	04/2003	E	Increasing	1C	Completed 01/2009	09/2018
<b>Yelloweye rockfish – Puget Sound/ Georgia Basin DPS</b>	04/2010; 01/2017 <sup>5</sup>	T	Decreasing	9C	Completed 10/2017	05/2016
<b>ATLANTIC STURGEON</b>						
Gulf of Maine DPS	02/2012	T	Unknown	3C	Under Development	Review Initiated 03/2018
New York Bight DPS	02/2012	E	Unknown	1C	Under Development	Review Initiated 03/2018
Chesapeake Bay DPS	02/2012	E	Unknown	1C	Under Development	Review Initiated 03/2018
Carolina DPS	02/2012	E	Increasing	1C	Under Development	Review Initiated 03/2018
South Atlantic DPS	02/2012	E	Mixed	1C	Under Development	Review Initiated 03/2018

Species Subspecies ESU/DPS	Date Listed Reclassified	ESA Status	Trend	Recovery Priority Number <sup>1</sup>	Status of Recovery Plan	Date 5-Year Status Review Completed <sup>3</sup>
<b>PLANTS</b>						
<b>Johnson's Sea-grass</b>	09/1998	T	Unknown	4C	Completed 09/2002	11/2007
<b>INVERTEBRATES</b>						
<b>Black Abalone</b>	01/2009	E	Unknown	5C	Under Development	07/2018
<b>White Abalone</b>	05/2001	E	Unknown	1C	Completed 10/2008	07/2018
<b>Lobed Star Coral</b>	09/2014	T	Decreasing	3C	Under Development	N/A
<b>Mountainous Star Coral</b>	09/2014	T	Decreasing	3C	Under Development	N/A
<b>Boulder Star Coral</b>	09/2014	T	Decreasing	3C	Under Development	N/A
<b>Pillar Coral</b>	09/2014	T	Decreasing	3C	Under Development	N/A
<b>Rough Cactus Coral</b>	09/2014	T	Decreasing	3C	Under Development	N/A
<b>7 Indo-Pacific Corals</b>	09/2014	T	Unknown	5C	Under Development	N/A
<b>Elkhorn Coral</b>	05/2006	T	Decreasing	3C	Completed 03/2015	08/2014
<b>Staghorn Coral</b>	05/2006	T	Decreasing	3C	Completed 03/2015	08/2014

Species Subspecies ESU/DPS	Date Listed Reclassified	ESA Status	Trend	Recovery Priority Number <sup>1</sup>	Status of Recovery Plan	Date 5-Year Status Review Completed <sup>3</sup>
<b>SEALS AND SEA LIONS</b>						
<b>Bearded Seal — Beringia DPS</b>	12/2012	T	Unknown	9C	Under Development	12/2010
<b>Ringed Seal—Arctic Subspecies</b>	12/2012	T	Unknown	9C	Under Development	12/2010
<b>Hawaiian Monk Seal</b>	11/1976	E	Increasing	1C	Completed 03/1983; Revision Completed 08/2007; Amended with Main Hawai- ian Island Management Plan 01/2016	08/2007
<b>Steller Sea Lion— Western DPS</b>	04/1990; 11/1990; 5/1997	E	Mixed	5C	Completed 12/1992; Revision Completed 03/2008	Review Initiated 12/2017
<b>WHALES</b>						
<b>Beluga Whale— Cook Inlet DPS</b>	10/2008	E	Decreasing	2C	Completed 01/2017	02/2017
<b>Blue Whale</b>	06/1970	E	Stable	8C	Completed 07/1998; Draft Revision 10/2018	Review Initiated 10/2018
<b>False Killer Whale— Main Hawai- ian Islands Insular DPS</b>	11/2012	E	Unknown	1C	Under Development	08/2010
<b>Fin Whale</b>	06/1970	E	Unknown	8C	Completed 07/2010	02/2019

Species Subspecies ESU/DPS	Date Listed Reclassified	ESA Status	Trend	Recovery Priority Number <sup>1</sup>	Status of Recovery Plan	Date 5-Year Status Review Completed <sup>2</sup>
<b>WHALES</b>						
<b>Killer Whale— Southern Resident DPS</b>	11/2005	E	Decreasing	1C	Completed 01/2008	12/2016
<b>North Atlantic Right Whale</b>	03/2008	E	Decreasing	1C	Completed 05/2005	10/2017
<b>North Pacific Right Whale</b>	03/2008	E	Unknown	4C	Completed 06/2013	12/2017
<b>Sei Whale</b>	06/1970	E	Unknown	6C	Completed 12/2011	Review Initiated 01/2018
<b>Sperm Whale</b>	06/1970	E	Unknown	7C	Completed 12/2010	06/2015
<b>HUMPBACK WHALE</b>						
Central America DPS	06/1970; 09/2016	E	Unknown	2C	1970 Listing Completed 11/1991; 2016 Listing Not Started	N/A
Mexico DPS	06/1970; 09/2016	T	Unknown	4C	1970 Listing Completed 11/1991; 2016 Listing Not Started	N/A
Western North Pacific DPS	06/1970; 09/2016	E	Unknown	7C	1970 Listing Completed 11/1991; 2016 Listing Not Started	N/A

<sup>1</sup> For explanation of the recovery priority numbers, see the Recovery Priority Guidelines (April 30, 2019; 84 FR 18243).

<sup>2</sup> For species listed within 5 years, a N/A (Not Applicable) is applied to the status of the 5-Year Review.

<sup>3</sup> In *Alesea Valley Alliance v. Evans*, 161 F. Supp. 2d 1154 (D. Or. 2001) (*Alesea*), the U.S. District Court for the District of Oregon ruled that NMFS could not exclude hatchery fish within the ESU when making a listing decision. Although the *Alesea* ruling affected only one ESU, subsequent to the ruling, NMFS initiated new status reviews for 27 ESUs and, in 2005, re-listed 15 ESUs of salmon with revised definitions of the populations to be included in the ESU, delisted one ESU (Oregon Coast coho) and listed one ESU (Lower Columbia River coho); and in 2006, re-listed 10 ESUs of steelhead (and identified them as DPSs).

<sup>4</sup> This ESU was first emergency-listed as threatened on 8/4/1989, then fully listed as threatened on 11/5/1990, then reclassified as endangered on 1/4/1994.

<sup>5</sup> The species listing was amended based on a geographic description and to include fish within specified boundaries (January 23, 2017; 82 FR 7711).

<sup>6</sup> This ESU was first listed on 8/18/1997; the southern range extension to the U.S.-Mexico border was added to the listing for this ESU on 5/1/2002 (57 FR 21586).

<sup>7</sup> The Gulf of Maine Atlantic Salmon DPS was originally listed on November 17, 2000 (65 FR 69469) and was revised to include the Androscoggin, Kennebec, and Penobscot River basins in 2009 (74 FR 29344, June 19, 2009).



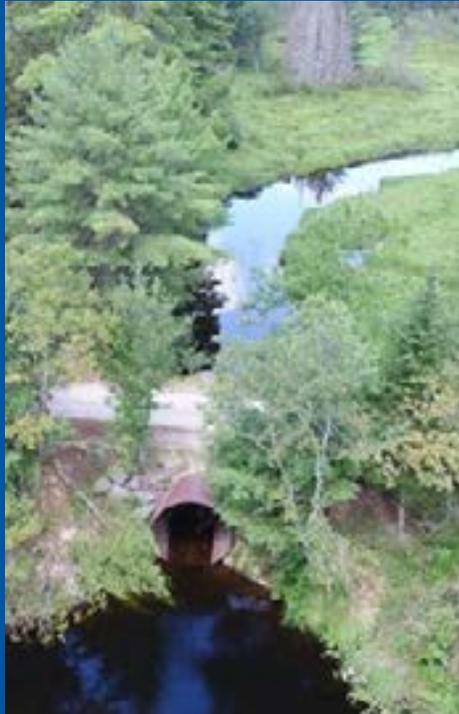


Photo Credit: NOAA (above left and section cover), Project SHARE (above middle), NOAA (above right)

# SPECIES *in the* SPOTLIGHT



Atlantic Salmon Gulf of Maine  
Distinct Population Segment





Photo Credit: NOAA

The Gulf of Maine DPS of Atlantic salmon (*Salmo salar*) is endangered and is one of three salmon Species in the Spotlight. They meet the criteria for being a spotlight species because of their dangerously low abundance and continuing declining population trend. Atlantic salmon are anadromous fish that spend the first half of their life in freshwater rivers and streams and then mature in the seas between Northeastern Canada and Greenland before returning to their natal rivers to spawn. In the United States, Atlantic salmon populations historically extended as far south as Long Island Sound. However, all southern populations have been extirpated. Today, the only remaining population of Atlantic salmon in U.S. waters exists in a few rivers and streams in central and eastern Maine.

### Recovery Progress

Since the launch of the Species in the Spotlight initiative in May 2015, NMFS and its partners have been working to implement four key actions identified in the five-year (2016–2020) priority actions plan designed to contribute significantly to Atlantic salmon recovery: (1) reconnect the Gulf of Maine with headwater streams, (2) increase the number of fish successfully entering the marine environment, (3) reduce international fishery

mortality in West Greenland, and (4) increase our understanding and ability to improve survival in the marine environment. These actions represent a critical subset of recovery actions identified in the new recovery plan for the species, which was published in February 2019 by the U.S. Fish and Wildlife Service (FWS)<sup>2</sup> and NMFS.

### Reconnect the Gulf of Maine with Headwater Streams

In 2017 and 2018, 39 aquatic connectivity projects were completed within the freshwater range of endangered salmon in Maine, opening access to approximately 145 miles of streams and rivers. By helping to restore connectivity and ecological stream processes, these projects enhance adult access to spawning grounds and help to increase the number of fish that are successfully entering the marine environment. The major hydroelectric developer in Maine, Brookfield Renewable Energy, is continuing to work with us to implement structural and operational changes at their dams. These project changes are designed to minimize impacts on Atlantic salmon in compliance with the ESA, while still enabling the company to generate power. Brookfield Energy has also implemented operational changes at dams on the Kennebec,

Androscoggin, and Union Rivers with a goal of improving downstream passage survival for Atlantic salmon smolts.

**Increase the Number of Fish Successfully Entering the Marine Environment**

Critical to increasing the number of fish entering the marine environment is addressing downstream survival of smolts through hydroelectric dams. Our population modeling efforts have revealed that if we provide upstream passage without adequate downstream passage we may be doing more harm than good to the population. We have made substantial headway in our negotiations with Brookfield Renewable Energy such that they have nearly met their downstream performance standards for all Mainstem dams on the Penobscot River. These standards require that all smolts must pass over a dam within 24 hours of their first approach at a survival rate of 96 percent or greater. There are also a number of other threats that affect the number of smolts entering the marine environment. These include reduced habitat quality resulting from current and historic land use practices; climate change; and predator prey dynamics. We have made investments into each of these threats but over the last two years, we have paid particularly close attention to issues associated with climate change. A recent climate vulnerability assessment of 82 species of fish and invertebrates in the Northeast Continental Shelf concluded that Atlantic salmon are particularly vulnerable to climate change as a product of their life history in relationship to climate exposure. In 2017, NMFS implemented a climate scenario planning exercise to identify science and management actions that under a range of plausible, alternative future climate scenarios would provide a conservation benefit to Atlantic salmon. As a result of this exercise, a number of climate related actions were incorporated into the final Atlantic salmon recovery plan (2019). Efforts are currently underway to implement two priority actions that originated



**Atlantic salmon Gulf of Maine**

*(Salmo salar)*

**Status:** Endangered

**Highlight:** Dangerously low abundance and continuing declining population trend.

**Recovery Efforts**



Reconnect the Gulf of Maine with headwater streams — **Completed 39 aquatic connectivity projects, opening access to approx. 145 miles of streams and rivers**



Increase the number of fish successfully entering the marine environment — **Smolt survival rate over Penobscot River dams near 96 percent or greater**



Reduce international fishery mortality in West Greenland — **Reduced catch by 15 metric tons**



Increase our understanding and ability to improve survival in the marine environment — **Deployed satellite tags on Atlantic salmon captured in Greenland to map migration patterns**

from the scenario planning exercise. These include conducting a range-wide habitat analysis to describe key habitat attributes that are important for Atlantic salmon persistence



Photo Credit: Project SHARE culvert replacement

and productivity, and mapping climate resilient and climate vulnerable habitats to identify where Atlantic salmon populations are most likely to succeed under warming conditions.

Removing dams, installing fishways, and infrastructure improvements at road crossings are critical to the recovery of Atlantic salmon because they allow passage to headwaters and ensure passage to the marine environment. These recovery actions not only benefit Atlantic salmon, but are also essential for the conservation of commercially valuable species like river herring and American eel, and recreationally important species such as American shad. Boosting river herring populations in Maine may also benefit the American lobster industry, as river herring are an important source of bait, particularly in the spring. Additionally, river herring also serve as a source of food for cod, haddock, and other commercially valuable species in the Gulf of Maine. Lastly, infrastructure improvements at road crossings that ensure fish passage for Atlantic salmon and other fish also afford substantial societal and economic benefits by significantly increasing structural resilience to storm events.

### **Reduce International Fishery Mortality in West Greenland**

The mixed stock fishery operating in West Greenland captures ESA-listed Atlantic salmon. At the 2018 annual meeting of the North Atlantic Salmon Conservation Organization (NASCO), the United States worked cooperatively with the other Parties of the West Greenland Commission (Canada, Denmark (in respect to the Faroe Islands and Greenland), and the European Union) to successfully negotiate new regulatory measures that reduce the catch of salmon by 15 metric tons in the mixed stock fishery at West Greenland for 2018, 2019, and 2020. The new regulatory measure caps the total catch of salmon for all components of the fishery at 30 metric tons, a substantial reduction from the 45 metric tons agreed upon in previous measures. The new regulatory measure also includes a number of elements that, if implemented, will significantly improve the management and control of the fishery. For example, licenses are now required for anyone who fishes for Atlantic salmon, including recreational and commercial fishermen. Accurate and detailed reports of fishing activities and landings, including no fishing effort and zero landings, are also required prior to receiving a license

to fish the following year. These requirements should improve the accuracy of the reported landings and support more informed fisheries management while also reducing the number of U.S. origin Atlantic salmon captured in this fishery.

### **Increase Our Understanding and Ability to Improve Survival in the Marine Environment**

In 2018, NMFS partnered with the Atlantic Salmon Federation (ASF, Canada), Canada's Department of Fisheries and Oceans, and the Association of Fishers and Hunters (Greenland) to increase knowledge of habitat use by satellite tagging and releasing Atlantic salmon captured at Greenland. This study will increase our understanding of Atlantic salmon migrations by providing detailed migration maps of habitat preferences and predators of Atlantic salmon as they migrate from Greenland to natal rivers to spawn. NMFS is also working to increase the information received from these tags by collaborating with the U.S. Woods Hole Oceanographic Institute, ASF, and private tag manufacturing companies to develop ways to share information and improve approaches to monitoring the marine migration of a wide variety of animals.

### **Other Recovery Progress**

2019 marks the focal year of the International Year of the Salmon, an initiative aimed at raising global awareness and enhancing knowledge about salmon conservation needs in a changing environment. Many of our species listed under the ESA are salmonids, including the Atlantic salmon. Along with partners across the northern hemisphere we are celebrating the International Year of the Salmon to share and develop knowledge, raise awareness, and take action for salmon conservation. While salmon conservation issues are tied closely to the West, Northeast, and Alaska coasts of the United States, these fish make epic migrations into international waters and the health of their populations raise

concerns about environmental change and human factors affecting salmon distribution and abundance well beyond these regional borders. Throughout the International Year of the Salmon initiative, we are working collaboratively with our partners to enhance outreach efforts to protect salmon and their habitat against the backdrop of increasing environmental variability. We are also working to increase investments in research that will assist us in building resilience for these populations.

In February 2019, NMFS, in collaboration with the FWS, published a final recovery plan to guide the recovery of the Gulf of Maine Atlantic salmon DPS. Threats to survival are significant in both the marine environment and in Maine's river systems. The plan prioritizes international and local actions that can realistically make a difference as our environment changes. The recovery plan provides a roadmap with detailed, site-specific approaches to reduce threats to the species, identifies specific timetables for action, and estimates costs to achieve recovery goals. Other benefits of implementing recovery actions include improvements in water quality and flow in salmon rivers, enhanced understanding of sustainable management for numerous freshwater and marine resources that are part of the salmon's ecosystem, and reductions in environmental stressors affecting salmon and the ecosystem upon which they depend.

### **Summary**

Access to freshwater spawning grounds has increased Atlantic salmon productivity. Downstream passage has been improved with achieving standards for smolt passage over dams. New regulatory measures were established that reduce the catch of Atlantic salmon by 15 metric tons (capped at 30 metric tons) in the mixed stock fishery in West Greenland for 2018, 2019, and 2020.



We have increased our knowledge of habitat use and Atlantic salmon migrations from Greenland to natal U.S. rivers. We are raising public awareness and increasing collaboration with our partners to enhance Atlantic salmon conservation through the International Year of the Salmon initiative. We, in collaboration with the FWS, recently finalized a recovery plan to efficiently and effectively guide recovery efforts.

All efforts this report highlights were made possible due to strong partnerships

involving the U.S. Department of Agriculture Natural Resource Conservation Service, Penobscot Indian Nation, Project SHARE (<https://salmonhabitat.org/>), Maine Department of Inland Fisheries and Wildlife, Maine Department of Marine Resources, Maine Department of Conservation, Maine Forest Service, NMFS, ASF, FWS, The Nature Conservancy (TNC), Downeast Lakes Land Trust, municipalities, lake associations, towns, and numerous private landowners.



Photo Credit: NOAA

## PARTNER in the SPOTLIGHT: John Banks, Penobscot Indian Nation

---

John Banks has served as the director of the Penobscot Indian Nation's Department of Natural Resources since 1980. John developed and administers a comprehensive natural resources management program for the Tribe. His program advances an integrated management approach that recognizes the inter-connectedness of all things in the natural world. He has served on numerous boards, commissions and delegations including the U.S. Delegation to the NASCO and the board of directors for the Penobscot River Restoration Trust. Thanks to John's tenacity, leadership, and support, the Penobscot River Restoration Trust (a consortium of non-governmental organizations (NGOs), the Penobscot Nation, state agencies, communities, and federal partners) led the successful removal of Veazie Dam and Great Works Dam and the de-commissioning of Howland Dam. This project referred to as the Penobscot River Restoration Project, improved access to thousands of kilometers of habitat in the Penobscot River and improves the chances that Atlantic salmon can recover in Maine.

As a member of the U.S. delegation to NASCO, John assisted the negotiation of the regulatory measure that substantially improved the monitoring and control of the fishery off Greenland from 2015 to 2017. Atlantic salmon are a culturally foundational species to the Penobscot Nation and are central to the tribe's history, ceremony, and sustenance. John carried the message of the importance of salmon to the Penobscot Nation, which was integral to the successful negotiation of that regulatory measure in 2015. John has been an influential voice in the salmon community for almost 40 years, and has been integral in the implementation of programs that have afforded significant conservation benefits to Atlantic salmon and sea run fish in the Penobscot River, one of the last strongholds for Atlantic salmon in the United States.

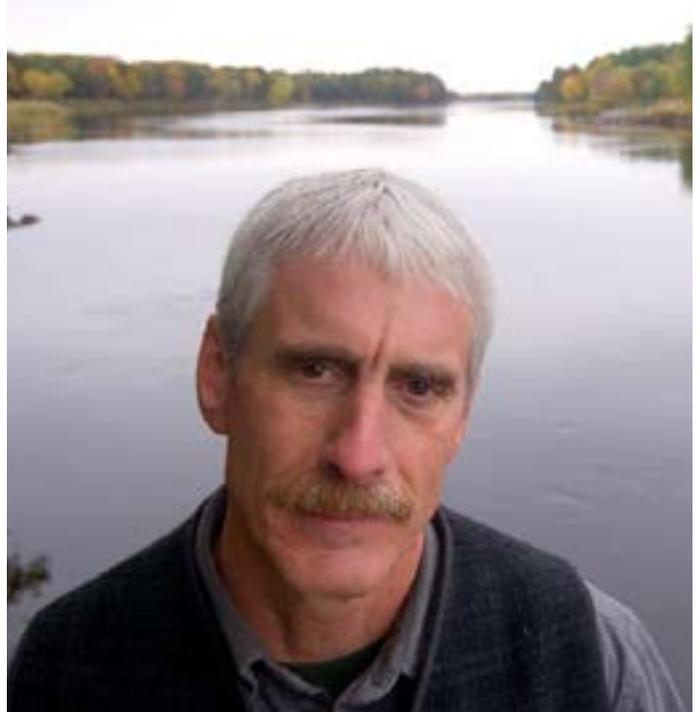


Photo Credit: Bridget Besaw

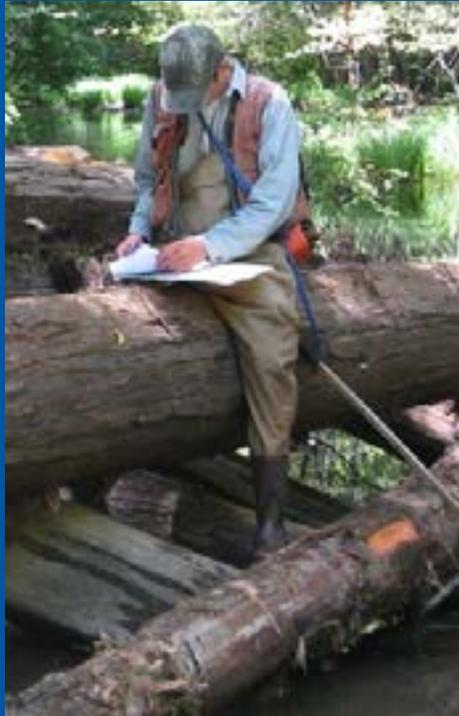
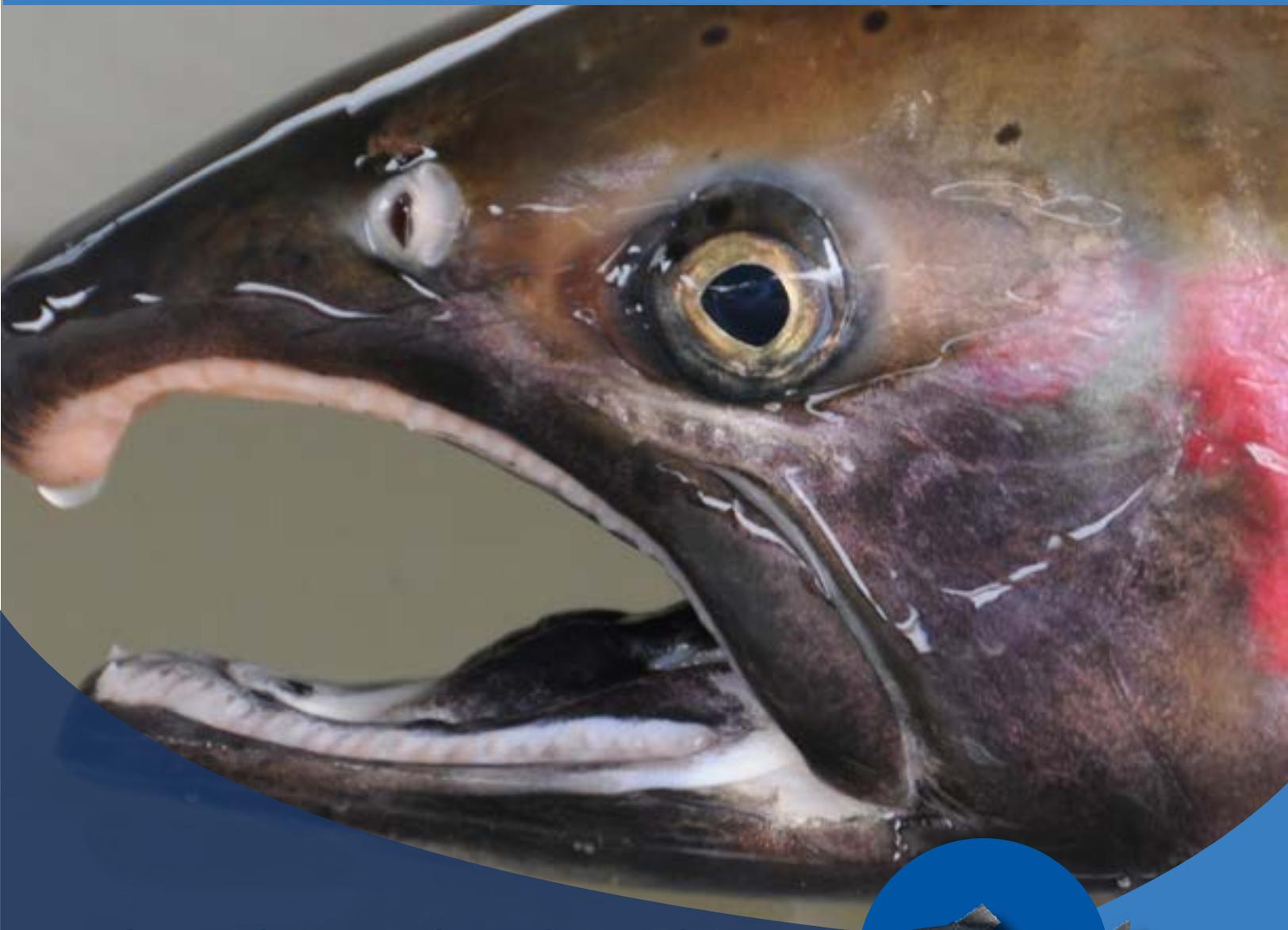


Photo Credit: mttamalpaisphotos.com (above left), Jennifer Carah, TNC (above middle), Eric Ettlinger (above right), Ben White, COE (section cover)

# SPECIES *in the* SPOTLIGHT



Central California Coast Coho ESU



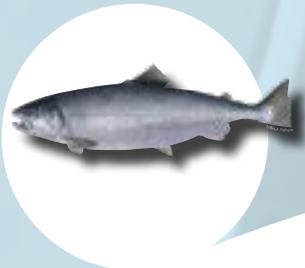


Photo Credit: Eric Ettlinger

Coho salmon (*Oncorhynchus kisutch*), commonly known as silver salmon, are an iconic part of California's natural heritage, and integral to the region's ecology. Recovering coho salmon will also provide social and economic benefits for future generations. Their recovery depends on many short and long-term actions, especially habitat restoration that is one of NMFS West Coast Region's highest priorities. Our work with partners is essential and is delivering on recovery goals, but there is much more to do and challenges remain. Recent and expected future droughts, for instance, underscore the importance of increasing the population throughout more of its historic range to improve the species' resilience.

Central California Coast (CCC) coho salmon were first listed under the ESA as a threatened species in 1996 and subsequently reclassified as endangered in 2005. CCC coho salmon became a state-listed endangered species under the California Endangered Species Act in 2002. The CCC coho salmon ESU

represents the southern extent of the species' larger range, and recent assessments of the ESU status indicate that it remains at high risk of extinction. Since 2011, California Department of Fish and Wildlife (CDFW) and NMFS have been leading the implementation of the California Coastal Monitoring Program. The program has continued to monitor CCC coho salmon, and NMFS uses this data to inform the species' five-year reviews. Over time, these data will expand our knowledge on the status and trends of CCC coho salmon and improve our understanding of the species' viability.

### Recovery Progress

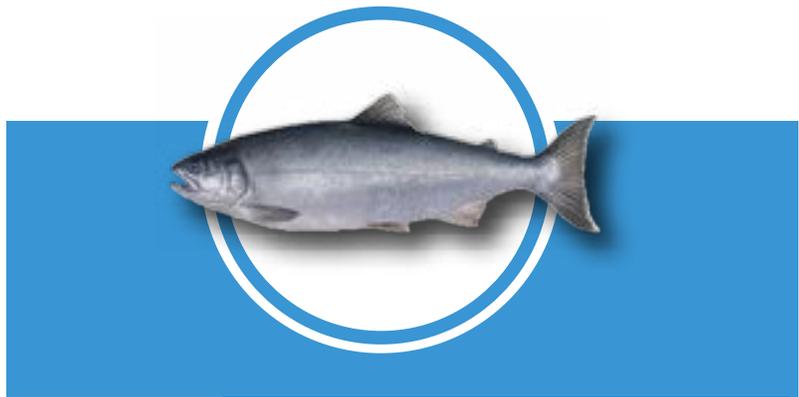
Since the Species in the Spotlight initiative was launched, NMFS has made substantial progress on CCC coho salmon recovery efforts, advancing each of the four key actions in the five-year priority actions plan: (1) continue and expand conservation hatchery programs to prevent extinction, (2) continue and expand restoration and funding partnerships through implementation of

priority recovery actions in targeted locations, (3) restore key habitats for conservation hatchery outplanting and improve freshwater survival of coho salmon, and (4) ensure adaptive management for conservation hatchery programs and restoration is informed by monitoring and research.

**Continue and Expand Conservation Hatchery Programs to Prevent Extinction**

Conservation hatchery efforts are intended to prevent extinction and improve distribution, abundance, and genetic diversity of populations while other efforts build our capacity for long-term recovery. The two conservation hatchery programs are the Russian River Coho Salmon Conservation Program operated from the recently named Michael Dillabough Russian River Salmon Conservation Hatchery in Sonoma County, California, and the smaller Kingfisher Flat Hatchery on Scott Creek in Santa Cruz County, California. While differing in size and funding, both programs began in 2001 in response to abundance levels of coho salmon that were severely depressed. CCC coho salmon are collected from the wild, brought into the hatcheries, genetically tested, and spawned to maximize diversity and avoid inbreeding. The hatchery raises coho salmon to various ages, feeds them krill, and tags them. From April through May, biologists conduct phased releases of these fish into streams to coincide with offshore ocean conditions. This release strategy allows the fish to imprint on the creek so they will return to these streams as adults and spawn naturally.

The multiagency/stakeholder Russian River Coho Salmon Conservation Program is effectively increasing coho salmon in the Russian River population, rescuing and rearing coho salmon from Redwood Creek, and reintroducing coho salmon to Walker and Salmon Creeks. Through habitat restoration and advancements in conservation hatchery practices and monitoring, today we see the



**Coho salmon** (*Oncorhynchus kisutch*)

**Status:** Endangered

**Highlight:** Extreme Drought and Catastrophic Wildfires

**Recovery Efforts**



Continue and expand conservation hatchery programs to prevent extinction— **Although well below the recovery target, spawning in the Russian River is the highest recorded over the last two decades**



Continue and expand restoration and funding partnerships through implementation of priority actions in targeted locations—**Restoration completed or ongoing in key locations critical to recovery**



Restore key habitats for conservation hatchery outplanting and improve freshwater survival of coho salmon—**Restored estuary and floodplain functions in several key watersheds**



Ensure adaptive management for conservation hatchery programs and restoration is informed by monitoring and research—**Collaborated with California to ensure long-term monitoring**

most adult coho salmon spawning in the Russian River in two decades. The approved CDFW and U.S. Army Corps of Engineers (COE) Hatchery Genetic Management Plan (HGMP) facilitates a regional expansion of the



coho salmon broodstock program to support reintroduction in streams within the northern portion of the CCC coho salmon ESU.

The HGMP includes expanded geographic and production potential and identifies groundbreaking monitoring techniques, research, and tools, such as Remote Salmon Incubators, to increase program capacity.

In 2018, NMFS, the COE, CDFW, and North Coast Regional Water Quality Control Board partnered with TNC, The Conservation Fund, and the Mendocino Redwood Company to capture Mendocino Coast coho salmon following several years of drought. Despite extensive efforts to restore and improve aquatic habitat, coho salmon populations in the Navarro and Garcia River have not increased. Once tens of thousands of adults returned to spawn each year, but numbers now trend at about a few hundred. Researchers believe these northern ESU coho salmon populations are not responding to the restored habitat because of the ecological and genetic effects caused by critically small populations over the last decade. The decision to bring coho salmon into the hatchery was guided by ten years of coho salmon monitoring by the partnership. To keep these salmon populations from going extinct, the partnership captured approximately 200 juvenile coho salmon from the Navarro and Garcia Rivers, transported them to the hatchery, and then tagged and genotyped them for analysis. The TNC and The Conservation fund have provided funding to raise juvenile fish to adulthood. A Technical Advisory Committee comprised of federal, state, and NGO scientists will develop a strategy to guide this new program.

In the southern portion of the ESU, a team of NMFS and CDFW technical staff are developing plans for relocating the Southern Coho Salmon Captive Broodstock Program for endangered CCC coho salmon from the Kingfisher Flat Genetic Conservation Fish

Hatchery to a new hatchery facility south of San Francisco. Although the Kingfisher Flat hatchery has been critical in saving the region's coho salmon from extinction, the size of the facility and available water cannot support expansion of the conservation program to a level needed for species recovery. The technical team has developed hatchery production goals needed for species recovery and identified the necessary water resources to achieve those production goals. The team is currently seeking funding for a feasibility study and meeting with local landowners and partners to review and evaluate alternative locations for the new facility. In the near future, the technical group will focus on securing funding for construction, equipment, and operations.

#### **Continue and Expand Restoration and Funding Partnerships through Implementation of Priority Recovery Actions in Targeted Locations**

Partnerships are essential for restoring coho salmon habitat throughout northern California. The state's Fisheries Restoration Grant Program, funded in part by the Pacific Coastal Salmon Recovery Fund (PCSRF) administered by NMFS, supports restoration projects that align with actions identified in the state and federal ESA recovery plans. In accordance with the PCSRF Federal Funding Opportunity, these funds are focused on projects and activities benefiting ESA-listed populations and addressing the limiting factors and priority actions specified in these recovery plans. Below are updates to three restoration projects named in the 5-year priority actions plan and three additional restoration projects that are large-scale and have multiple habitat benefits for coho salmon.

The Scott Creek Lagoon Restoration and Highway 1 Bridge Replacement project is moving forward with the South Embankment Study. About 60 percent of the replacement designs will be completed in 2019. This



Photo Credit: Derek Acomb

project will allow the river to return to its historical meander and restore the marsh/lagoon habitat for improved juvenile rearing. The Santa Cruz Resource Conservation District and California Department of Transportation continue to work on strategies for funding the new bridge and causeway. Replacement of the bridge, and included restoration of the marsh-lagoon complex of Scott Creek, is the highest recovery priority in the Santa Cruz area.

The Garcia River Estuary Enhancement Plan was completed in early 2018 and is under review. This high-priority recovery action will restore the estuarine and floodplain habitats. These habitats influence the survival and fitness of salmon at population-level scales. The NOAA Restoration Center (NOAA RC) staff have been working with TNC on permitting and funding strategies to implement restoration actions detailed in the plan.

TNC implemented phase 1 of a restoration project at five sites in the lower South Fork Ten Mile River including multiple engineered

log jams and a sizeable wetland pond that will provide refuge and rearing habitat for coho salmon. Partial funding and permits have been secured for phase 2 of this project, which will implement similar projects on the South Fork Ten Mile River. The NOAA RC is currently working with TNC to advance the rest of the Ten Mile River watershed conceptual plans. TNC is submitting grant applications to CDFW's Fisheries Restoration Grant Program. If grant applications are successful, implementation will resume in 2020. NOAA RC staff are also working with Trout Unlimited on multiple large wood projects in upstream Ten Mile River's Core and Phase I priority tributaries as identified in the recovery plan.

In 2017 and 2018, 597 instream habitat structures consisting of over 1,464 pieces of large woody debris (including whole trees and rootwads) were added to coho salmon core habitat throughout the Albion River, Big River, Garcia River, Navarro River, Noyo River, and Ten Mile River systems. In 2018, the James Creek Fish Passage Project was completed. The improvement of fish passage in James



Creek, a tributary of the upper Big River in Mendocino County, opened more than four miles of high quality habitat, and coho salmon were documented upstream of the barrier the first winter after removal.

The Salmon Protection and Watershed Network (SPAWN) enhanced a 0.5-mile floodplain in Lagunitas Creek, Marin County. In 2016 and 2018, over 10,000 cubic yards of fill and numerous abandoned and dilapidated buildings were removed from the floodplain, creating side channels with refuge habitat for juvenile coho salmon and steelhead. SPAWN installed large woody debris, removed invasive plants, and reforested the riparian corridor with over 9,000 native plants from SPAWN's Native Plant Nursery. Phase two of the project is planned for 2019. Hundreds of volunteers assisted in transplanting and nurturing native plants to support the restoration project.

### **Restore Key Habitats for Conservation Hatchery Outplanting and Improve Freshwater Survival of Coho Salmon**

Conservation hatchery broodstock outplanting requires strategically focused habitat restoration. Since many outplanting sites are located on private land (e.g., agriculture, timber operations, etc.), outreach to these landowners and assistance with project design and permitting has improved our ability to restore key habitats in strategic locations. The NOAA RC provided approximately \$1.4 million in funding for the Butano Creek Channel Hydrologic Reconnection Project located in the Pescadero Creek watershed. This project aims to reconnect Butano Creek to the Pescadero Creek estuary by dredging approximately 1.5 miles of channel and providing fish access to over 10 miles of upstream spawning habitat that is currently impeded by sedimentation. This project will also alleviate the regular steelhead fish kills



Photo Credit: Jennifer Carah

Examples of restoration projects in the Russian River watershed to support hatchery coho salmon.

- NMFS has an ongoing partnership with Sonoma Water and the COE in the pilot implementation of the Forecast Informed Reservoir Operations concept, intended to improve water storage capability for municipal supplies and fisheries flows.

- Additionally, estuarine habitat modelling via Habitat Blueprint funding is ongoing with Sonoma Water, Bodega Bay Marine Laboratory, University of California and other partners to guide estuary management and restoration.

- Trout Unlimited constructed the Yellowjacket Creek Fish Passage Project in partnership with Jackson Family Wines (JFW). The passage project opens up 1.9 miles of spawning and rearing habitat on JFW property, a Core Recovery Area identified in the CCC

Coho salmon Recovery Plan. An ESA Section 10 Safe Harbor Agreement with JFW ensures fish passage, fish flows, habitat improvements and, stocking of juvenile coho salmon.

- NMFS partnered with E. & J. Gallo Winery to enhance streamflows to Porter Creek from an off-stream reservoir.

- NMFS has been working with Sonoma County Open Space District (SCOSD) and Regional Parks Department, CDFW, and others to restore significant floodplain habitat in Mark West Creek for coho salmon. SCOSD purchased the property and transferred it to Sonoma County Regional Parks last year for future public access and protection. Park project proponents have plans and designs for future restoration via grant applications to numerous funding solicitations for 2019.

caused by poor water quality. Once this project is completed and fish kills cease, NMFS will consider reintroducing coho salmon in this watershed using fish from the Southern Coho Salmon Captive Broodstock Program.

The Lower Scott Creek Floodplain and Habitat Enhancement Project Phases 1-3 were completed between 2014 and 2017. This project included installation and enhancement of multiple instream wood complexes and reconnecting the stream channel with the adjacent floodplain. Overall, the project will increase habitat complexity and floodplain connectivity along 4,500 feet of the lower mainstem of Scott Creek, where Southern Coho Salmon Captive Broodstock Program monitoring and outplanting sites are located.

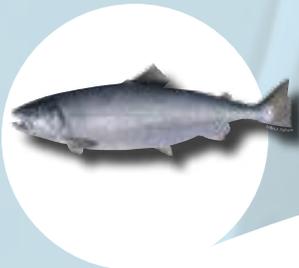
The San Vicente Creek Large Wood Habitat Enhancement Project was implemented in 2017. This project included felling 48 standing redwood trees into San Vicente

Creek, located in Santa Cruz County. The addition of large wood to the channel and floodplain will increase instream habitat complexity and facilitate sediment sorting and trapping, which will improve overwinter survival of juvenile coho salmon and steelhead. Robust monitoring programs are evaluating the effectiveness of the project.

In the Russian River watershed many restoration projects have occurred in areas where Russian River Conservation Hatchery coho salmon are currently released or planned to be released (see inset box).

#### **Ensure Adaptive Management for Conservation Hatchery Programs and Restoration is Informed by Monitoring and Research**

Monitoring and research efforts by federal, state, and local agencies, NGOs, and private partners have provided critical information to adapt conservation hatchery practices, broodstock release strategies, and restoration



work. Population abundance and distribution monitoring also provides needed information on status and trends and guides conservation strategies for the recovery of coho salmon. However, there continues to be a funding shortfall for priority monitoring efforts. NMFS and CDFW continue to collaborate on ways to achieve a stable, long-term funding mechanism for monitoring CCC coho salmon populations.

### Summary

The 2015 launch of the Species in the Spotlight initiative for CCC coho salmon came during the worst drought on record in California. California experienced well below average precipitation from 2012 through 2015, record high temperatures in 2014 and 2015, and record low snowpack in 2015. Some paleoclimate reconstructions suggest that this drought was the most extreme in the past 500 or perhaps more than 1,000 years. The drought was followed by catastrophic wildfires along the coast and northern interior, a series of unrelenting storms and

extremely wet 2016–2018 winters. We will see the impact of the drought, fires, and flooding on CCC coho salmon populations for many generations.

Although there are still critically low numbers of CCC coho, they have persisted despite the challenges. That is due largely to the concerted and coordinated efforts of private landowners and volunteers; state and local agencies; hatchery managers, and non-profit organizations who are dedicated to coho salmon recovery and are partnering with NMFS to restore coho habitat and advance key recovery actions.

The Species in the Spotlight initiative has helped leverage funds for restoration and conservation, brought new partners to coho salmon recovery, and re-prioritized NMFS resources to energize state and federal collaborations. The initiative has affirmed the hard work of dedicated individuals who are involved every day in these conservation hatchery and habitat restoration programs.



Photo Credit: Dan Wilson

## PARTNER in the SPOTLIGHT: Russian River Coho Salmon Hatchery Team

The Russian River Coho Salmon Hatchery Team, formed of the COE and CDFW hatchery employees, has played a critical role in CCC coho salmon recovery. The Coho Salmon Hatchery Team has been rearing endangered CCC coho salmon since 2001 when CDFW first collected broodstock from the Russian River. Coho salmon had been in decline since the 1960s on the central California coast and peaked in 2001, when drought and desiccated streams led CDFW to partner with the COE and NMFS on coho recovery in the Russian River. Following a complete and intensive habitat and fish survey of the basin, and documentation of the dire situation for coho salmon, CDFW led a rescue of the last coho salmon in the basin. The COE, who constructed and owned the steelhead mitigation hatchery, quickly funded and installed six additional round tanks solely dedicated to the rearing of coho salmon.

Since 2001, the Coho Salmon Hatchery Team has been committed to coho recovery by expanding operations and staffing the facility to meet the expanding scope and need of the recovery efforts. In 2006, Marin County coho salmon were integrated into the program to diversify broodstock genetics. In 2008, surplus hatchery juveniles and adults were reintroduced to Walker and Salmon Creeks along the Sonoma/Marin Coast where they were locally extinct. In 2011, the COE funded the hatchery expansion, staffing, and operations to accommodate and care for more adult and juvenile coho salmon. In 2014, when a record drought hit the region, CDFW partnered with the National Park Service to capture and rear rescued Marin County juvenile coho salmon, which were released as adults to supplement 2016 to 2018 spawning populations; and in 2017, the COE and CDFW together submitted a HGMP to NMFS, which formalized the plans for a Regional Coho Salmon Conservation Hatchery Program. In 2018, 17 years since the first Russian River rescue, the Team formed a new partnership with TNC, the Conservation Fund, and the Mendocino Redwood Company to capture and rear Mendocino Coast coho salmon from the Garcia and Navarro Rivers.

Since the inception of the Coho Salmon Conservation Program, hatchery releases have grown from 6,000 to 200,000 coho salmon annually. The Team has cooperatively built a separate facility, hired permanent staff, and dedicated additional funds, resources, and energy towards a partnership that now spans the entire CCC coho salmon ESU. As a result, the Russian River and Redwood Creek coho salmon populations were saved from local extinction and abundance has grown from a low in the teens to over 100 fish. In addition, coho salmon were successfully reintroduced to several watersheds where coho had been locally extinct – and natural reproduction is now occurring. The Coho Salmon Hatchery Team serves four counties (Sonoma, Marin, Mendocino, and Santa Cruz) and seven different CCC coho salmon populations. The Team also assists the Southern Coho Salmon Captive Broodstock Program at the southern end of the CCC range. The Russian River Coho Salmon Hatchery Team have been consistently dedicated to coho salmon recovery in the area for over 15 years.



The Russian River Coho Salmon Hatchery Team: (left to right) Brett Wilson, CDFW; Bradley Stokes, COE; Ben White, COE; Ellen McKenna, CDFW; Matt Wong, CDFW; Ken Leister, COE; Rory Taylor, COE; and Brian Freele, CDFW.

Photo Credit: Erin Seghesio, NMFS



Photo Credit: Robert Frankevich (above left), Verena Gill, NMFS (above middle and section cover), Autumn Sutherland (above right)



# SPECIES *in the* SPOTLIGHT



Cook Inlet Beluga Whale DPS



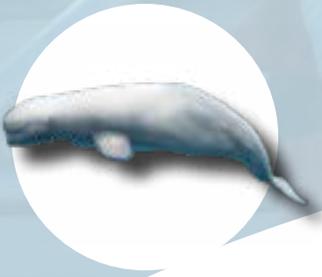


Photo Credit: David Blazejewski

The endangered Cook Inlet beluga whale (*Delphinapterus leucas*) has been in decline since 1979. Where once there were an estimated 1,300 of these white whales adjacent to Alaska's most populous region, only an estimated 328 remain. The rapid decline and dire status of the Cook Inlet beluga whale population makes it a priority for NMFS and our partners to prevent extinction and promote recovery of this iconic species. The majority of the decline resulted from unregulated subsistence hunting, but almost 20 years after the hunting was greatly curtailed, the population has failed to increase in numbers. We lack the information to understand why this beluga whale population is not increasing.

### Recovery Progress

Since the launch of the Species in the Spotlight initiative, partnerships have advanced implementation of the five-year priority actions plan for the Cook Inlet beluga whale. The plan focuses on five critical actions to improve conservation efforts: (1) reduce the threat of anthropogenic noise in Cook Inlet beluga whale habitat, (2) protect

habitats that support foraging or reproduction of Cook Inlet beluga whales, (3) gain a better understanding of population characteristics of Cook Inlet beluga whales to ensure effective management actions result in recovery, (4) ensure healthy and plentiful prey are available, and (5) improve understanding of why Cook Inlet beluga whales are not recovering by enhancing the stranding response program.

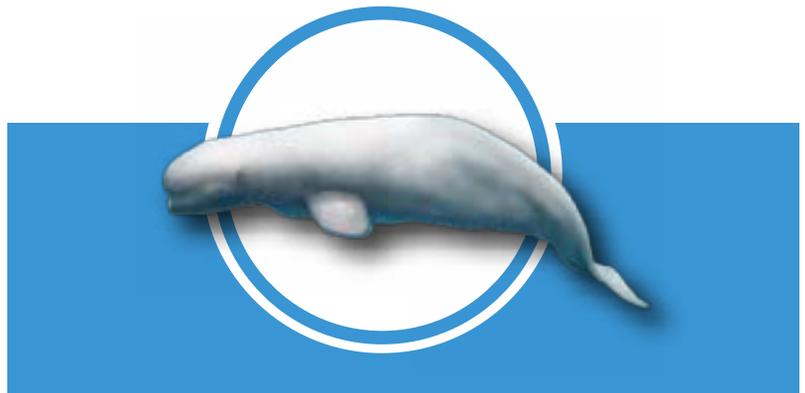
### Reduce the Threat of Anthropogenic Noise in Cook Inlet Beluga Whale Habitat

Cook Inlet beluga whales are a very difficult species to study. The extraordinarily silty water they live in makes them invisible except for the portions of their bodies that break the surface of the water. Thirty-foot tides, the highest in the United States and miles-wide mudflats make boating extremely dangerous. For a third of the year, belugas dwell among large chunks of ice that swift tides wash back and forth. While the harsh conditions may help protect Cook Inlet belugas from killer whales, this dynamic environment severely hinders our ability to understand what may be limiting their recovery.

The turbid waters also limit the whales' ability to see their food and each other. They see their world through echolocation, which makes noise pollution in Cook Inlet a potentially serious problem. Cook Inlet is a naturally noisy environment at times, given the hiss of glacial silt in the water, the rushing tides moving rubble around on the bottom, and the cracks and rumbles of shifting ice during much of the year. Although belugas in Cook Inlet live in an area where vision is severely limited and the habitat is naturally noisy, they have managed to adapt to these conditions. What they have perhaps not adapted to as well is human-caused noise from activities such as pile driving, seismic exploration, oil and gas rigs, ship traffic, and military operations.

NMFS, other agencies, and industry partners are continually seeking ways to quiet the belugas' soundscape. Minimizing the presence of industrial noise in the waters within 10 miles of especially important habitat around the Susitna River Delta is one such measure. The Port of Anchorage has also gone to great effort to test technologies like confined bubble curtains and sonic resonators to reduce the amount of in-water noise from pile driving activities.

A partnership of scientists from NMFS and Alaska Department of Fish & Game (ADF&G) has been deploying passive acoustic monitors around key locations in Cook Inlet to identify beluga seasonal feeding grounds and then to better understand noise in these waters and its potential effects on belugas. In 2019, 14 different locations throughout Cook Inlet were acoustically monitored. NMFS is also deploying Cetacean and Porpoise Detectors, which detect the echolocation clicks of toothed whales, dolphins, and porpoises. These detectors classify groups of potential echolocation signals based on the intensity, duration, frequency content, and variation in inter-click intervals. This



**Cook Inlet beluga whale** (*Delphinapterus leucas*)

**Status:** Endangered  
**Highlight:** An estimated 328 remain

**Recovery Efforts**



Decrease the threat of anthropogenic noise in Cook Inlet beluga whale habitat — **Minimized the presence of industrial noise in the waters within 10 miles of important habitat in the Susitna River Delta**



Protect Habitats that Support Foraging or Reproduction of Cook Inlet Beluga Whales — **Increased knowledge of winter habitats to avoid adverse impacts.**



Gain a Better Understanding of Population Characteristics of Cook Inlet Beluga Whales to Ensure Effective Management Actions Result in Recovery — **Deployed 132 unmanned aircraft flights to identify individual whales, body condition, and health**



Ensure healthy and plentiful prey are available— **Collected water and fish samples in four locations in upper Cook Inlet to test for contaminants**



Improve understanding of why Cook Inlet beluga whales are not recovering by enhancing the stranding response program — **Increased public reports of stranded belugas and improved stranding response time**



provides temporal data on beluga activity such as presence, feeding behavior, or habitat usage. In 2020, NMFS is hoping to expand the detectors project to focus on beluga use of, and disturbance at, key foraging rivers in both the upper and lower Cook Inlet. These monitors provide information about the relative importance of different parts of Cook Inlet to belugas, and the degree to which humans acoustically affect these areas. This knowledge will better inform effective management and conservation actions.

#### **Protect Habitats that Support Foraging or Reproduction of Cook Inlet Beluga Whales**

Directly across Cook Inlet from Anchorage lies the Susitna River Delta, which appears to function as the very core of essential habitat for these whales. While it is important that these belugas have access to many runs of fish throughout the year at different locations, the Susitna's runs of salmon and eulachon are the belugas' main food source. The Susitna River Delta is an important calving area. As reported in the last Biennial

report, in 2015, Dr. Tamara McGuire, LGL Alaska Research Associates, Inc., and her skipper, Brad Goetz observed a female beluga give birth to a healthy newborn. Information such as this, which highlights the importance of the Susitna River Delta region to Cook Inlet belugas for both foraging and reproduction, have led to this sensitive area receiving special consideration and protection during ESA section 7 consultations.

Although we have a good understanding of areas important to Cook Inlet belugas in the summer, we still know little about their winter habits. In an attempt to better document beluga distribution and habitat during non-summer months, NMFS is partnering with the Bureau of Ocean Energy Management (BOEM) to implement winter aerial surveys from 2018–2021. The early effort has already provided fruitful information suggesting important wintering areas. This information will also benefit BOEM as that agency prepares for upcoming oil and gas lease sales in lower Cook Inlet.



Photo Credit: Chris Garner, JBER

### **Gain a Better Understanding of Population Characteristics of Cook Inlet Beluga Whales to Ensure Effective Management Actions Result in Recovery**

Our best range-wide population monitoring information for Cook Inlet belugas comes from aerial surveys conducted by the NMFS Marine Mammal Laboratory since 1993. These surveys help estimate the abundance of Cook Inlet belugas throughout their range. The next survey is scheduled to take place in June 2020.

In a partnership with local NGOs, NMFS is expanding a citizen science monitoring project for Cook Inlet belugas in 2019. Trained members of the public will collect observational data on seasonal beluga activity during standardized monitoring sessions. The citizen science monitoring, coupled with opportunistic sighting reports and systematic surveys, will be used to determine range-wide beluga presence and behavior. The data will be displayed in the Cook Inlet Beluga Whale Sightings Portal. This publically accessible portal is the result of a partnership between NMFS, Axiom, and the Alaska Ocean Observing System.

NMFS supported a partner-led research using non-invasive photograph identification of Cook Inlet belugas. Images collected by private contractors, Department of Defense Joint Base Elmendorf-Richardson biologists, and the public are compiled into the Cook Inlet Beluga Whale Photo-Identification Project's catalog. The data obtained from this long-term non-invasive study have provided vital individual-based information to managers, especially in regards to individual survival and reproductive history. It also provides information on group size, distribution, age-classes, habitat use, movements, feeding and calving grounds, calf-rearing areas, transit corridors, exposure to human activities, sexual distribution, and health.

An important indicator of population health and nutritional distress is female age at first reproduction (AFR). If AFR increases over time, it may be an indication of food limitation in the population. If AFR decreases with time, it can indicate a top-down factor such as predation or disease. Studies have shown that population AFR in mammals is quantifiable by measuring growth layer groups in the teeth. In 2018, NMFS partnered with the University of Alaska, Anchorage and the North Slope Borough in a graduate student project to assess the feasibility of using teeth from Cook Inlet beluga whales to estimate AFR.

To better understand why belugas are not recovering, NMFS collects data on physiology and body condition. NMFS collects this information by obtaining biopsy samples from Cook Inlet belugas. From 2016–2018, 39 samples have been collected. Sophisticated analysis of these tiny plugs of skin and blubber can provide insights into genetics, reproductive status, contaminant loads, and other important parameters. Cook Inlet beluga samples collected to date have identified pregnant females from reproductive hormone assays and estimated ages of whales.

Beginning in 2017, NMFS began using small unmanned aircraft to collect very detailed aerial imagery of beluga whales in the hopes that the images can be used to assess beluga whale body condition, health, and add to the existing photo-ID catalog. By the end of the 2018 season, NMFS made 132 flights on 26 groups of belugas. In 2019, we plan to expand sampling to use unmanned aircraft overhead photos for a future photo-ID mark-recapture abundance estimate.

In 2020, ADF&G will provide an individual-based population model that we anticipate will strengthen our estimate of Cook Inlet beluga whale vital rates. Data that feeds into the

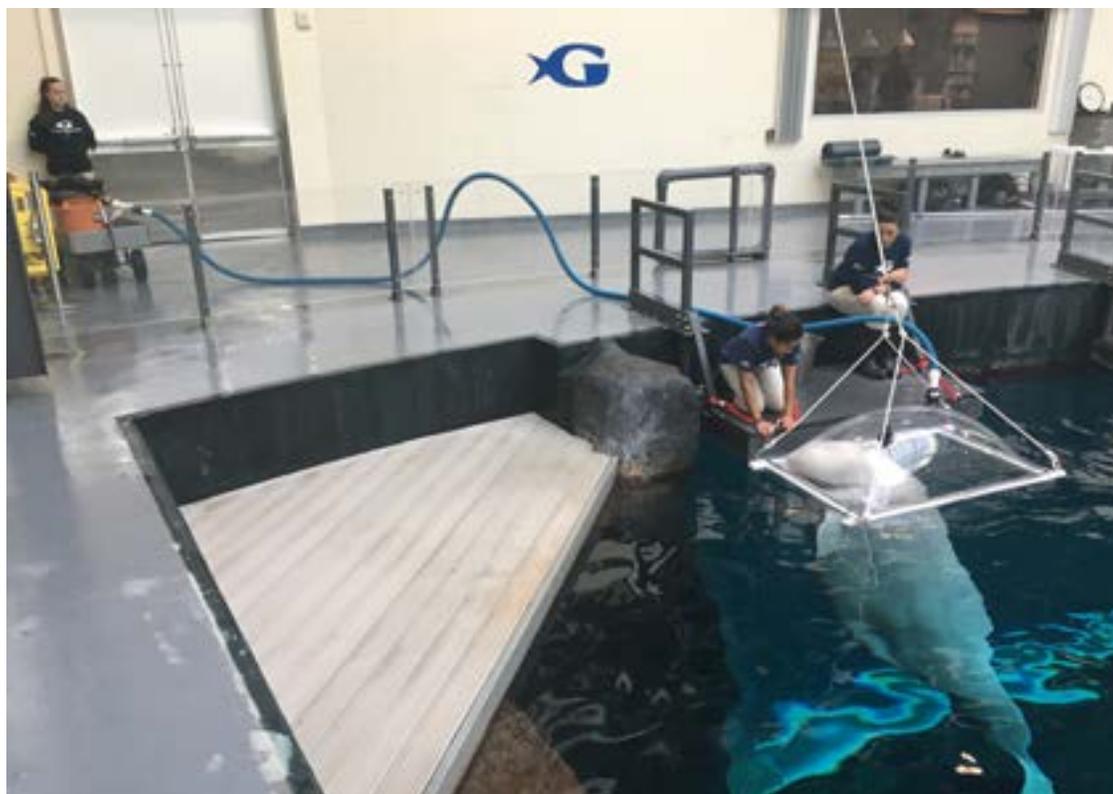


Photo Credit: Georgia Aquarium

model include the Cook Inlet Beluga Whale Photo ID project, necropsies from beach-cast carcasses, satellite and aerial surveys, and genetics from the Bristol Bay population of beluga whales. This individual-based model will achieve two main goals; provide a preliminary assessment of whether vital rates can be estimated from the data being used, and evaluate the effectiveness of new sources of information to strengthen vital rate estimates.

#### **Ensure Healthy and Plentiful Prey are Available**

The Cook Inlet beluga population remains suppressed either because they are not reproducing fast enough or their survival rates are too low, or both. The availability of sufficient food could affect either of these factors.

In order to understand if there is sufficient prey for Cook Inlet belugas, we need to

understand the whale's nutritional needs for healthy growth and reproduction. In 2018, NMFS partnered with the Georgia Aquarium and University of California Santa Cruz for a study to determine the energetic requirements and metabolic needs of belugas. Data on oxygen consumption of resting and diving whales at Georgia Aquarium will be correlated with their overall body condition and daily caloric food intake. This will allow metabolic demands of the whales to be matched to potential prey resource needs and applied to the wild Cook Inlet beluga population.

NMFS also initiated a study to assess the health of beluga prey in Cook Inlet, with emphasis on resident fish. Partnering with staff from Joint Base Elmendorf-Richardson and the NMFS Northwest Fisheries Science Center, we collected fish and water samples in 2017 from four locations in upper Cook Inlet to analyze for contaminants of emerging

concern such as pharmaceuticals and personal care products. The fish preliminarily tested positive for 21 of the 119 analytes tested and the water tested positive for four of the 126 analytes tested. Results are currently being analyzed to determine their significance.

In 2019-20, an Alaska Sea Grant fellow is scheduled to join NMFS to identify year-round distribution and abundance of beluga prey in rivers and streams throughout Cook Inlet. This project will highlight data gaps and greatly expand our understanding of what belugas may be eating in the winter months, which has not been well documented previously.

#### **Improve Understanding of Why Cook Inlet Beluga Whales are not Recovering by Enhancing the Stranding Response Program**

Scientists sample dead Cook Inlet beluga whales to find clues regarding their lack of recovery. In order to obtain the biological information we need from these dead whales, we need to find them before the process of decay has become advanced. To this end, NMFS is redoubling its efforts to inform area pilots and members of the public to quickly report sightings of dead (or live-stranded) animals so ground crews can respond rapidly.

We distributed stranding response kits to specially trained partners, giving them the tools to conduct good field examinations of beluga carcasses. We are pursuing arrangements to make aircraft available to us on short notice to allow access to stranded whales along those portions of Cook Inlet that are not road accessible. It is hoped with all the increased efforts in outreach and education (see Other Recovery Progress) that we will receive more reports on stranded belugas faster. Since 2018, public reports of stranded belugas have increased and our stranding response time has and continues to improve.

#### **Other Recovery Progress**

A main purpose of the overall Species in the Spotlight initiative is to gain public support for recovering highly endangered species. In the case of Cook Inlet beluga whales, NMFS relies heavily on its many partners to advance this effort. Our biggest partnership event is “Belugas Count!”. This all-day citizen science celebration aims to bring together members of the public to focus on the endangered Cook Inlet beluga whale, fostering local pride, awareness, and stewardship. It is a collaboration among a variety of federal and state agencies, local and national organizations, industry, as well as individuals. The initial event was held on September 9, 2017, and was so successful, we decided to make this an annual event. Belugas Count! will be held September 21, 2019. The morning of Belugas Count! is dedicated to engaging the public in helping partners count belugas from staffed stations throughout Cook Inlet. Adult and juvenile Cook Inlet belugas were counted at multiple stations during the event in both 2017 and 2018. Activities on the afternoon are held at the Alaska Zoo where a free event includes talks and activities about Cook Inlet belugas. Around 600 people have been attending this portion of Belugas Count! The public and four beluga-focused aquariums also participate via social media posts and livestreams, which reached over 40,000 people during the 2018 event.

NMFS developed Cook Inlet beluga whale outreach materials to add to its expanding outreach kit. Materials include a tri-fold informational brochure; school-level curricula about Cook Inlet beluga whales; bookmarks with viewing guidelines for pilots and boaters with a slogan “Stay High and Fly By” and “Your Boating Action Can Cause an Adverse Reaction”, and a sticker sheet highlighting the ecosystem of Cook Inlet focused around beluga whales. These materials are used in schools and at events like the Great Alaska Aviation Gathering



and the Great Alaska Sportsman Show. In addition, NMFS produced new metal signs for public roadways that access rivers and streams important to Cook Inlet belugas. The signs highlight both the plight of Cook Inlet belugas and suggest ways to mitigate impacts from boat disturbance and avoid beluga interactions. We are participating in stories in local and national print media, radio stations, and television to educate the public about how they can avoid potential harassment of belugas, report sightings of healthy whales and help us enhance our response to stranded whales.

Another example of successfully garnering support for Cook Inlet beluga recovery has been the formation in 2018 of the multi-partner Cook Inlet Beluga Whale Recovery Implementation Task Force jointly run by NMFS and ADF&G. The primary role of the task Force is to engage the expertise of researchers, managers, communicators, and various other stakeholders to advise NMFS and ADF&G on specific topics or issues relating to Cook Inlet beluga recovery. It will provide guidance and recommendations

for most effective recovery action implementation and will help prioritize limited resources to make the most difference in achieving recovery. The focus will be on short-term actions that can be completed in the next 2-5 years without losing sight of the importance of long-term projects and research.

### Summary

In collaboration with our partners, we continue to improve our knowledge of Cook Inlet beluga whales and their habitat needs. This information supports effective and efficient management programs to increase the likelihood that beluga whales will recover. We are also improving our communication with key groups in the region to help avoid beluga harassment. Additional research to identify critical factors limiting the Cook Inlet beluga population is vital to recovery. We must not lose this irreplaceable species that is so important to tourism and to local residents. Cook Inlet beluga whales also are culturally important to Native subsistence hunters that hope to resume sustainable harvest of this once abundant whale.



Photo Credit: Dan Wilson

## PARTNER in the SPOTLIGHT: Sue Goodglick, ADF&G

Over the last two years Sue Goodglick, ADF&G, has become a crucial member of the multi-partner Cook Inlet beluga whale 'team'. Sue is a wildlife biologist for the State of Alaska's Marine Mammals Program and had been assisting with pinniped research and coordination until spring 2017 when a call went out for someone from the State to partner with NMFS for the inaugural Belugas Count! event. Sue jumped in with both feet forward and never looked back. Her commitment, passion, out of the box thinking, 'can-do' attitude, humility, humor, and uncanny attention to detail all greatly contributed to the success of Belugas Count! and helped make it a much-anticipated annual event for the public. Sue's ability to implement an approach with mutual gains has also aided in creating a cohesive Belugas Count! partnership of over 20 diverse groups from industry to NGOs. She never hesitates to go the extra mile and overcame her fear of live TV and very early mornings to take one for the team, twice! She is usually the first one to volunteer for outreach events to promote beluga conservation such as Potter Marsh Discovery Day. As well as being the lynchpin for the Belugas Count! Event, Sue co-chairs (with NMFS) the Outreach Committee of the Cook Inlet Beluga Whale Recovery Implementation Task Force. The purpose of the Task Force is to advise NMFS and ADF&G on issues related to Cook Inlet beluga whale recovery, including recommending practicable and effective ways to implement the 2016 recovery plan for the Cook Inlet Beluga Whale. In this role, she has also increased communication and coordination between agencies and stakeholders working to recover Cook Inlet beluga whales, promoted open and constructive discussion of ideas and information, and kept the Committee moving forward and making steady progress.



Photo Credit: Sue Goodglick



Photo Credit: NOAA (above left), Mark Sullivan (above middle), NOAA (above right and section cover)

# SPECIES *in the* SPOTLIGHT



Hawaiian Monk Seal





Photo Credit: Mark Sullivan

The Hawaiian monk seal (*Neomonachus schauinslandi*) is the world's only surviving tropical seal species. Hawaiian monk seals are endemic to the Hawaiian Archipelago, which stretches 1,500 miles from Hawaii Island to Kure Atoll. There are only about 1,400 Hawaiian monk seals left in the world. While recent population assessments have yielded some encouraging results, the predominant trend has been a steep population decline since the 1950s.

The 2018 annual population assessment showed that Hawaiian monk seals have increased in numbers by about 2 percent annually since 2013, reversing at least six decades of steep population decline. The population is now estimated to be around 1,430 seals, with roughly 1,100 of those seals in the Northwestern Hawaiian Islands and 300 in the main Hawaiian Islands. This recent growth trend is primarily due to increased juvenile survival in the Northwestern Hawaiian Islands and stability or growth of the six subpopulations. Rapid growth trends observed in the main Hawaiian Islands

subpopulation starting in the 1990s appear to have slowed or stopped, and the overall population numbers have remained stable since 2013, although 2018 was a record year with 31 pups born in the main Hawaiian Islands (excluding Niihau), a 30 percent increase over the previous record of 21 in 2013.

### Recovery Progress

Since the launch of the Species in the Spotlight initiative, we have been working with our partners to implement the five key actions in the five-year priority actions plan for Hawaiian monk seals: (1) improve survival of juvenile and adult female seals in the Northwestern Hawaiian Islands, (2) manage and mitigate human-seal interactions to ensure natural population growth, minimize conflict, and foster coexistence, (3) detect and prevent catastrophic disease outbreak and disease-related mortality, (4) develop and implement strategic communications plan and social marketing strategy, and (5) encourage community-led monk seal stewardship and citizen science.

### Improve Survival of Juvenile and Adult Female Seals in the Northwestern Hawaiian Islands

Despite the recent increase described above, numbers are still only about one-third of historic population levels. A slowed rate of decline leading up to the recent population increase is due in many ways to NMFS and partner recovery efforts. In fact, an estimated 30 percent of monk seals alive today are here because they directly benefited, or are the pup or grandpup of a female that benefited, from a lifesaving intervention performed by NMFS with the aid of our partners, such as disentanglement or dehooking. A total of 154 interventions to improve individual seals' survival prospects were performed in 2017–2018 in the Northwestern Hawaiian Islands. These included translocation of 45 pups from high shark predation risk areas to lower risk sites within French Frigate Shoals Atoll, releasing 14 seals entangled in marine debris and 18 seals trapped behind the Tern Island sea wall, and additional miscellaneous interventions including rescuing young pups from high waves and reuniting separated mothers and pups. Twenty-five malnourished seals were taken from the Northwestern Hawaiian Islands to The Marine Mammal Center's Ke Kai Ola facility on Hawaii Island, which opened in 2014 to rehabilitate monk seals.

### Manage and Mitigate Human-Seal Interactions to Ensure Natural Population Growth, Minimize Conflict, and Foster Coexistence

Monk seals were essentially extirpated from the main Hawaiian Islands for many years, although in recent decades they successfully reestablished a small but thriving population. While this is a hopeful sign for recovery of the species, a human population unfamiliar with seals resulted in negative human-seal interactions such as harassment of seals hauled out on beaches, hookings, intentional killings, and more. There has been a noticeable shift in public attitude towards



Hawaiian monk seal (*Neomonachus schauinslandi*)

**Status:** Endangered

**Highlight:** 1,400 Hawaiian monk seals left in the world

#### Recovery Efforts



Improve Survival of Juvenile and Adult Female Seals in the Northwestern Hawaiian Islands — **Intervened 154 times in 2017-2018 to improve individual seals' survival in the Northwestern Hawaiian Islands**



Manage and Mitigate Human-Seal Interactions to Ensure Natural Population Growth, Minimize Conflict, and Foster Coexistence — **Launched "It's ok to call!" slogan to encourage reporting of seal-fishery interactions**



Detect and Prevent Catastrophic Disease Outbreak and Disease-Related Mortality — **Vaccinated over 700 monk seals for morbillivirus**



Develop and Implement Strategic Communications Plan and Social Marketing Strategy — **Developed communication strategy and increased public engagement in conservation of monk seals**



Encourage Community-led Monk Seal Stewardship and Citizen Science — **Increased the number of public reports about monk seals from around 7,000 in 2016 to about 9,000 in 2018**



the positive in recent years, due partially to the fact that seals have now been in the MHI long enough that residents are getting used to their presence and younger generations on islands with larger seal populations are growing up seeing them on a regular basis. The shift is also due in part to the work of NMFS, our partners, and community members sharing information, educating the public, and engaging with local community encouraging coexistence.

A combination of approaches has been used to address this priority, including outreach directed at fishermen and other key stakeholder groups, improving our monitoring and data management, providing grants to the State of Hawaii Department of Land and Natural Resources (DLNR) and NGOs for community-based efforts, intervening directly

with seals exhibiting concerning behavior, and rescuing hooked and entangled seals. A new set of graphics and messaging were developed for outreach purposes as part of our FAST program (Fishing Around Seals and Turtles). Two reflective decals—one decal for hook and line fishermen and one for spearfishermen—provide guidance on how to prevent negative interactions with monk seals and promoting our “It’s ok to call!” slogan, designed to encourage reporting of incidents and interactions. The decals and messaging have proven to be popular with fishermen and have received positive local news media and social media exposure. Nevertheless, hookings and entanglements in state-managed nearshore fisheries continue to pose a significant recovery threat. DLNR was awarded a grant under Section 6 of the ESA to address these harmful fishery interactions



Photo Credit: NOAA

with monk seals (and sea turtles) via the development of a conservation plan and other activities. We will continue to support and encourage our state partner to reduce fishery impacts to monk seals and other protected species.

While attitudes are shifting and NMFS and partners have a strong presence in the community, there are still occasional interactions that are detrimental to individual seals, including three intentional killings in 2018 on the island of Molokai. Following the discovery of these killings, we engaged key individuals within the Molokai community to develop a collaborative strategy of community in-reach, which is discussed further in the Encourage Community-led Monk Seal Stewardship and Citizen Science section below.

#### **Detect and Prevent Catastrophic Disease Outbreak and Disease-Related Mortality**

Our program remains focused on morbillivirus and toxoplasmosis; two diseases that are very different, but both carry serious potential consequences for monk seals.

Morbillivirus is widespread and outbreaks of the disease have caused the deaths of thousands of dolphins and seals around the world, including the death of about 2,300 grey and harbor seals on the east coast of the United States since July 2018. This family of viruses includes measles, which human children are immunized against, and distemper, which is part of a core vaccination series for pet dogs. The disease has not yet been documented in monk seals in Hawaii, but could potentially be contracted from unvaccinated dogs or from other marine mammals such as whales and dolphins. Once introduced into the small population of monk seals, without an intervention like the vaccination program described below, an outbreak could set back recovery for decades, or eliminate hope for the species altogether.

In February 2016, after years of investigation and safety and effectiveness trials, NMFS began vaccinating wild monk seals. After an initial push that resulted in 84 vaccinated animals in the main Hawaiian Islands and 654 in the Northwestern Hawaiian Islands, this program is moving into a maintenance phase focusing primarily on weaned pups and animals we were unable to vaccinate in previous years. Samples are collected opportunistically from vaccinated seals to study antibody titers over time. As of the end of 2018, we are approaching herd immunity in 70 to 100 percent of simulated outbreak scenarios for the Northeastern Hawaiian Islands and Oahu and Kauai in the main Hawaiian Islands. Niihau remains a large gap in our efforts due to the fact that the majority of the main Hawaiian Islands population resides there, but we have limited access to perform these types of mitigation efforts. This is the first ever effort to vaccinate a wild marine mammal species, and NMFS hopes this will lay the foundation for future efforts to vaccinate marine wildlife against preventable diseases and safeguard populations against potentially devastating losses.

Feral cats and toxoplasmosis have long been known as threats to terrestrial species, but in recent years, it has become apparent that toxoplasmosis also poses a major threat to marine mammals, most notably the endangered Hawaiian monk seal. While all cats have the potential to carry the disease, indoor pet cats are much less likely to spread the disease as long as their litter is properly disposed of. Feral cats in particular are thought to be the primary vectors of the disease in Hawaii. Feral, abandoned, and other outdoor cats (also called “at-large” cats) have substantial, documented negative impacts on wildlife and are responsible for numerous mammal, reptile, and bird species extinctions. Cats function as vectors for several diseases, some of which have deleterious effects on human, wildlife, and domestic animal health.



Photo Credit: Mark Sullivan

Cats are the sole definitive hosts of the protozoal parasite *Toxoplasma gondii*, which spreads when the cat sheds the oocysts (eggs) in their feces.

On the island of Oahu alone, there are an estimated 50,000–300,000 feral cats. Since 2001, there have been a minimum of eleven monk seal deaths attributable to toxoplasmosis in the Hawaiian Islands, including at least three in 2018. These numbers are likely a significant underestimate as NMFS is unable to recover every monk seal carcass, and, of those we do recover, some have decomposed beyond the point where identification of diseases like toxoplasmosis is possible. Additionally, mortalities seem to be disproportionately females, which means that not only are those animals lost, but their reproductive contribution to the population has been lost as well. Toxoplasmosis has become the number one disease threat to

monk seals. Our ability to mitigate this threat is complicated by a paucity of preventative or curative measures, the fact that NMFS has no jurisdiction over cats or terrestrial ecosystems where they are found, and that policy and management actions enacted or proposed in an attempt to manage cats are consistently met with strong opposition from a vocal minority.

An interagency working group was created in May 2016 following a NMFS and DLNR co-sponsored workshop, consisting of federal, state, and county agencies committed to sharing information and resources to reduce the impacts of feral, abandoned, and outdoor cats. This working group, called the Toxoplasmosis and At-large Cat Technical Working Group continues to grow and develop, reaching out to potential partner agencies, engaging with stakeholders, discussing community outreach

messaging, initiating literature reviews to better understand proposed solutions to the problem, and organizing symposia at local conservation conferences among other actions. NMFS is in the early stages of developing a strategic plan, which will lay out a roadmap for NMFS and partners moving forward in the effort to reduce the threat of this deadly disease to Hawaiian monk seals and other native wildlife.

### **Develop and Implement Strategic Communications Plan and Social Marketing Strategy**

We are working toward developing a proper strategy and conducting thorough research of major concerns and hurdles to engaging in desired behaviors for all stakeholder groups. While we do not have this expertise in-house, we have been able to leverage partnerships and other internal resources to help develop a strategic communications plan and social marketing strategy. Graduate and undergraduate students working on social science projects have contributed useful information. A group of volunteer interns has conducted extensive research and laid the groundwork for a plan. Staff have formed an internal Community Based Social Marketing group for knowledge sharing and discussing ideas, and some staff have received trainings on the principles and practices of social marketing and targeted communication, which has been incorporated into our education and outreach materials, web and social media presence, and community engagement.

In the summer of 2017, a monk seal gave birth on a crowded beach in the Waikiki area, one of the most populated areas in the state. Public attention was constant, public and seal safety concerns were high, and therefore NMFS was essentially obligated to deliver a steady stream of strategic messaging. This provided us with a unique opportunity to use non-traditional methods of public engagement such as “pupdates”—

live-streamed question-and-answer segments with NMFS biologists produced by a local non-profit news group— in order to disseminate messaging in real time appropriate to the evolving situation on the beach and address the public’s questions, concerns, and understanding of monk seals. This effort facilitated new and creative ways of communicating with the public, built new and strengthened existing partnership, and brought a new level of attention to Hawaii’s native seal, not only from residents but from mainland U.S. and international visitors as well. A whole network of self-appointed monk seal stewards and ambassadors has emerged since the event and they contribute to our monitoring efforts by calling in sightings, and public outreach efforts by taking it upon themselves to educate other members of the public when they encounter monk seals on the beach.

### **Encourage Community-led Monk Seal Stewardship and Citizen Science**

Community engagement and monk seal monitoring efforts are cornerstones of our recovery program and they dovetail in the form of a dedicated network of volunteers. Volunteers across the islands work with various partner agencies and organizations to report seal sightings and observe seals on local beaches. Volunteers also spend many hours answering questions and educating visitors and community members about the Hawaiian monk seal. NMFS and partners maintain a seal reporting “hotline” and coordinate a network of partners, staff, and volunteers throughout the main Hawaiian Islands. For many years, individual hotline numbers operated on each island, including two on Hawaii Island, which proved to be confusing for residents and visitors. Since consolidating the individual island hotlines into one statewide reporting number that also accepts calls for sea turtles and cetaceans, the number of monk seal sighting calls increased from about 7,000 in 2016 to around 9,000 in 2018.



We have focused our efforts on dialogue and partnership with a small group of influential community leaders who are interested in taking the lead on community-led monk seal stewardship and “inreach” to local community members, such as fishermen, most likely to interact with monk seals. Thus, this group of community leaders is helping NMFS communicate via an existing framework for natural resource management that has been used by Native Hawaiians for generations. This allows community members to dialogue in a manner that they are comfortable and familiar with, and NMFS is able to gain insight into their concerns and perceptions and then address those concerns and exchange information via trusted liaisons.

### Summary

Although more work remains to recover the species, NMFS and our partners have made significant headway in reducing the extinction risk of Hawaiian monk seals. We celebrate the encouraging news of the recent population increase, which inspires us to continue to work diligently across the archipelago to combat threats to monk seals and more than six decades of population decline. Through the Species in the Spotlight program, we continue to build and leverage strategic partnerships that will contribute to and complement our recovery efforts as we work toward recovery of Hawaii’s native seal. The five-year priority actions plan, along with increased collaboration with partners, will provide significant recovery benefit to monk seals.



Photo Credit: NOAA

## PARTNER in the SPOTLIGHT: U.S. Coast Guard, District 14

How do you get a 400-pound Hawaiian monk seal from Point A to Point B? In a U.S. Coast Guard HC-130 aircraft, of course! Rescue and rehabilitation of malnourished, injured, or ill individuals is a critical component of recovery for

monk seals, the most endangered pinnipeds in the United States. Monk seals from across the Hawaiian archipelago, including the remote and uninhabited Northwestern Hawaiian Islands, may need to be transported to or from NMFS facilities on the island of Oahu or The Marine Mammal Center's Ke Kai Ola facility on the island of Hawaii for actions such as surgical or medical interventions, long-term care, or rehabilitation. Options for moving large animals between islands are limited, especially when time is of the essence or the location is remote and difficult to access. The partnership between the U.S. Coast Guard and the Pacific Islands Marine Mammal Health and Stranding Response Program was formalized in 2008. Since 2008, the U.S. Coast Guard has been able to respond to more than 50 requests for transporting seals between islands, including a record-setting transport of seven female monk seals from Hawaii Island to Oahu in April 2016 following nearly 7 months of rehabilitation. These efforts translate into an excess of \$450,000 in dedicated operational and staff support. The partnership is truly one of a kind, and is not just beneficial for the seals. U.S. Coast Guard pilots need to log a certain number of hours in the air per year, so transporting the seals means flight time not only contributes to the training requirement, but also potentially saves the life of the animal(s) on board, as well as provides an educational and rewarding encounter with monk seals for the U.S. Coast Guard members involved.





Photo Credit: NOAA Permit #15488, Florida Fish & Wildlife Conservation Commission (above and section cover)

# SPECIES *in the* SPOTLIGHT



North Atlantic Right Whale





North Atlantic right whales (*Eubalaena glacialis*) range primarily from calving grounds in coastal waters of the southeastern U.S. to feeding grounds in New England waters and the Canadian Bay of Fundy, Scotian Shelf, and Gulf of St. Lawrence. Right whales aggregate seasonally in seven known areas: the coastal waters of the southeastern United States; the Great South Channel; Jordan Basin; Georges Basin along the northeastern edge of Georges Bank; Cape Cod and Massachusetts Bays; the Bay of Fundy; and the Roseway Basin on the Scotian Shelf. Since around 2010, fewer whales have been using some of these established habitats and have been staying within them for shorter periods. In addition, a newly recognized region south of the Massachusetts islands of Nantucket and Martha's Vineyard has been found to contain a large portion of the North Atlantic right whale population in winter through early spring. Surveys this summer and fall will be directed along the 50-fathom contour from the Hague Line to the mid-Atlantic to see if whales persist in this region year-round.

North Atlantic right whales are protected under both the ESA and the Marine Mammal Protection Act. They have been listed as endangered under the ESA since 1970. The North Atlantic right whale is one of the world's most endangered large whale species, currently numbering approximately 400 individuals. By the early 1890s, commercial whalers had hunted right whales in the Atlantic to the brink of extinction. After commercial whaling stopped, right whales experienced several decades of slow recovery and by 1990, the estimated minimum population reached 268 individuals. In the early 1990s, the population continued to grow to approximately 481 individuals in 2010. However, fluctuating mortality rates and decreased calving have led to a population decline that has continued for at least the last 8 years. Exacerbating the decline in total abundance is the continuous decreasing



North Atlantic right whales travel north to New England every year to feed off the dense concentrations of plankton (specifically copepods) that can be found in these productive waters. Thanks to the work of dedicated aerial survey teams, NMFS and its partners are able to monitor right whale locations, behavior, population shifts, and overall health within this critical habitat. These surveys and discoveries provide essential information that is necessary for reducing human impacts and helping NMFS take actions that support right whales recovery. (NOAA Permit #775-1660; Photographer: Cynthia Christman, NOAA)

proportion of adult females in the population owing to lower survival rates compared to adult males. A large number of observed right whale mortalities in 2017 prompted a declaration of an Unusual Mortality Event throughout the species' range and continues to be investigated for causative factors as elevated mortalities continue to be documented into 2019.

Because of the small population size and low annual reproductive rate of right whales, human-caused mortality affects their population growth rates more than other large whales. Also unlike other large whale species, right whales can occur very close to shore (< 1 mile). Vessel strikes and entanglement in fishing gear are the principal factors retarding growth and recovery of the population.

### Recovery Progress

NMFS will develop a five-year priority actions plan with input from an expanded coastwide U.S. Right Whale Recovery Plan Implementation Team (composed of two region-specific implementation teams). The Team will be convened in 2019 to focus on priority cross-regional recovery actions for this species. Key actions that build off the recovery plan for the North Atlantic Right Whale will be identified in the five-year priority actions plan, and we will report on progress on those actions in the next Biennial report.

### Other Recovery Progress

Extensive collaboration among stakeholders has been extremely important for right whale conservation efforts. NMFS has formed two regional (U.S. Northeast and U.S. Southeast) recovery implementation teams that assist and advise NMFS relative to regional right whale recovery tasks. NMFS funded the state of Massachusetts and Center for Coastal Studies to conduct aerial surveys for right whales and monitor abundance of copepods (*Calanus sp.*), the primary food source for right whales, in Cape Cod Bay. NMFS and the Center for Coastal Studies support and provide emergency response to entangled right and other large whales. NMFS supports the New England Aquarium to maintain a catalog of individual right whales, their identifying features and database of the resightings of those individuals—the fundamental building block of all of our population estimates and modeling exercises. The Aquarium is also involved in many other aspects of right whale recovery. The states of Florida and Georgia have been involved in monitoring right whale calf production, obtaining genetics samples of right whale calves and other unsampled individual right whales, and have rescued entangled right whales. The COE, U.S. Coast Guard, BOEM, and U.S. Navy have been instrumental in funding various aspects of monitoring and research and are involved in regional implementation team efforts. All of these entities—and many



North Atlantic right whales

(*Eubalaena glacialis*)

**Status:** Endangered

**Highlight:** 411 individuals remaining at the end of 2017

### Recovery Efforts



Five-year priority actions plan with input from an expanded coastwide U.S. Right Whale Recovery Plan Implementation Team



Focus on priority cross-regional recovery actions for this species.



Key actions that build off the recovery plan for the North Atlantic Right Whale will be identified



Report on progress on those actions in the next Biennial report.

others— participate in the North Atlantic Right Whale Consortium (NARWC). The NARWC includes more than 200 individuals from various research and conservation organizations, shipping and fishing industries,



technical experts, U.S. and Canadian government agencies, and state and provincial authorities. The NARWC is dedicated to the conservation and recovery of the North Atlantic right whale.

NMFS and our partners are committed to conserving and rebuilding the North Atlantic right whale population using a variety of innovative techniques to study, protect, and rescue these endangered whales.

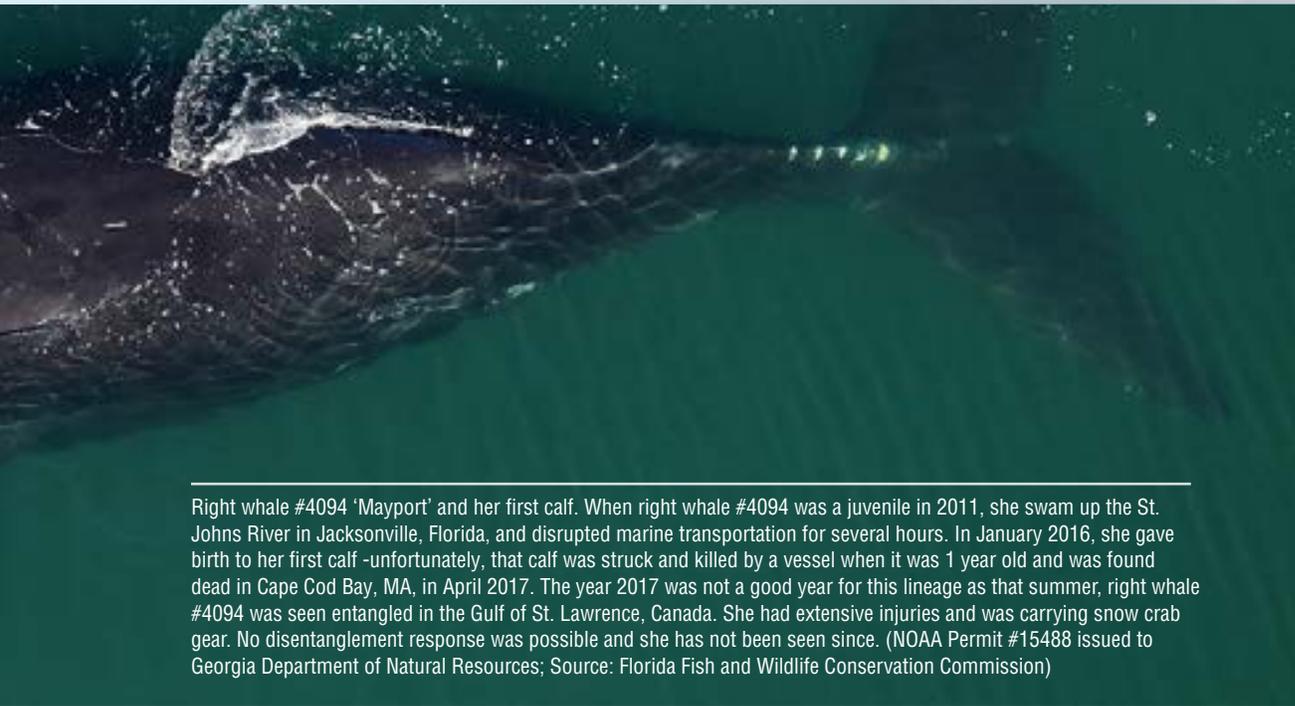
NMFS is currently conducting a review of its vessel speed restriction rule (pursuant to 50 CFR 224.105). The review will culminate in a report that will assess economic impacts to the maritime community, vessel traffic compliance with the rule, impacts to

navigational safety, conservation benefits to right whales, and outreach activities. NMFS is analyzing relevant data in collaboration with other organizations and scientists. The review is well underway, and we hope to circulate a draft for public comment by the end of the year. In addition, NMFS has taken several steps to reduce the threat of vessel collisions with North Atlantic right whales (see inset box).

For more than two decades, NMFS has implemented management measures to reduce whale entanglements in commercial fishing gear with the help of the Atlantic Large Whale Take Reduction Team—a group of stakeholders consisting of fishermen, scientists, conservationists, and state and

Examples of efforts to reduce vessel collisions with North Atlantic Right Whales.

- Since 2008, implementing mandatory speed restrictions of 10 knots or less for vessels 65 feet or greater in overall length in Seasonal Management Areas along the U.S. east coast at certain times of the year when whales may be present.
- Encouraging voluntary speed reductions in Dynamic Management Areas.
- Recommending alternative shipping routes and areas to be avoided and modifying international shipping lanes.
- Developing right whale alert systems and mandatory vessel reporting systems.
- Increasing outreach and education to recreational and commercial mariners.



Right whale #4094 'Mayport' and her first calf. When right whale #4094 was a juvenile in 2011, she swam up the St. Johns River in Jacksonville, Florida, and disrupted marine transportation for several hours. In January 2016, she gave birth to her first calf -unfortunately, that calf was struck and killed by a vessel when it was 1 year old and was found dead in Cape Cod Bay, MA, in April 2017. The year 2017 was not a good year for this lineage as that summer, right whale #4094 was seen entangled in the Gulf of St. Lawrence, Canada. She had extensive injuries and was carrying snow crab gear. No disentanglement response was possible and she has not been seen since. (NOAA Permit #15488 issued to Georgia Department of Natural Resources; Source: Florida Fish and Wildlife Conservation Commission)

federal officials. We require commercial fishermen to use certain gear modifications that are meant to reduce entanglement risk to North Atlantic right whales and have established areas where fishing cannot occur during certain times when North Atlantic right whales are present (see inset box).

However, entanglement in fishing gear continues to be a source of mortality and serious injury for this species; therefore, we are currently working with the Atlantic States Marine Fisheries Commission, the New England states, and the Take Reduction Team to develop additional management measures to further reduce the risk of entanglement

in fishing gear. The Atlantic Large Whale Take Reduction Team met in April 2019 to develop recommended changes to the Take Reduction Plan that would reduce the effects of fixed gear fisheries on North Atlantic right whales. The Team was able to reach nearly unanimous consensus on a framework of measures that should achieve a 60 percent reduction in the risk of serious injury and mortality in trap/pot fisheries in the Gulf of Maine and southern New England. Two general risk reduction approaches emerged as the Team's preferred options: substantial buoy line reduction and gear modification to require buoy lines that can be broken by right whales.

Examples of efforts to reduce serious injury and mortality of North Atlantic Right Whales in commercial fisheries.

- Since 2007, and expanded in 2014, a number of areas of predictable aggregations of right whales have been seasonally closed to fixed gear commercial fisheries. Cumulatively, over 6,300 square miles are closed to trap/pot fishing during 3 month closures each year, and over 28,000 square miles are closed to gillnetting in closures of 3 to 6 months.
- Since 1997, expanded in 2007, weak links have been required in fixed gear fisheries fishing to increase the likelihood that right whales can break free of buoy lines and gillnet panels.
- In 2007, floating line between trap/pots on the bottom of the ocean was comprehensively replaced by sinking line, removing thousands of miles of entangling line from the water column.
- Buoy line marking has been required since 2000 on most fixed gear buoy lines to improve our understanding of where and how right whales become entangled.



There are many other efforts underway between NMFS and our partners to recover right whales. For example, NMFS is actively collaborating with Canada on science and management gaps that are impeding the recovery of North Atlantic right whales in both Canadian and U.S. waters. We are also convening expert working groups to solicit individual input on our management and monitoring efforts. This expert elicitation will help NMFS determine best methods for assessing the health of individual right whales and effectively direct management and science resources towards the most important recovery activities. Additionally, NMFS continues to conduct high-quality scientific research on North Atlantic right whales in collaboration with our partners including, but not limited to, aerial and shipboard surveys of right whale distribution, acoustic monitoring of whale presence, health assessments, photo-identification of individuals, and oceanographic and ecosystem assessments.

All efforts are important to help better understand the threats and needed actions to recover North Atlantic right whales.

### Summary

NMFS is working to protect this species on multiple fronts, with the goal of increasing the population abundance. Partnerships are critical to North Atlantic right whale recovery and there are many important efforts underway. The major actions recommended in the recovery plan for the North Atlantic right whale include reducing or eliminating injury and mortality caused by vessel collisions and fishing gear, protecting habitats essential to the survival and recovery of the species, and minimizing the effects of vessel disturbance. Through the work of NMFS and our partners, we have made significant progress toward reducing the impacts of these threats to right whales. However, based on the status of the population, additional efforts are needed and underway.



Photo Credit: NOAA Permit #20556, Florida Fish & Wildlife Conservation Commission

## PARTNER in the SPOTLIGHT: North Atlantic Right Whale Consortium

---



The NARWC includes over 200 partners dedicated to conserving and recovering North Atlantic right whales. The NARWC's website is an important source of information on right whales and includes information on annual meetings, NARWC databases, and annual report cards (<https://www.narwc.org/>).

As stated previously, the NARWC includes over 200 partners dedicated to conserving and recovering North Atlantic right whales. Partners include those from research and conservation organizations, industries (e.g., shipping and fishing), U.S. and Canadian government agencies, as well as state and provincial authorities. The NARWC fosters data sharing by providing access to various data contributed by investigators—this effort is critical to furthering information on North Atlantic right whales. Annual meetings of the NARWC provide a unique opportunity to bring partners together to share management and scientific information across the species' range. Partnerships represented by those in the NARWC are critical to North Atlantic right whale recovery; for this reason, we are happy to acknowledge the important long-term contributions of the NARWC.



Photo Credit: NOAA Permit #594-1759, Florida Fish & Wildlife Conservation Commission



Photo Credit: Scott Benson, NMFS (above left, middle, and section cover), Brian Skerry, National Geographic Magazine (above right)

# SPECIES *in the* SPOTLIGHT

Pacific Leatherback Sea Turtles





Photo Credit: Scott, Benson, NMFS

Pacific leatherbacks (*Dermochelys coriacea*) are one of the most endangered sea turtle species in the world. Pacific leatherbacks are composed of two separate nesting populations—the Eastern Pacific and the Western Pacific. The Eastern Pacific population nests mainly in Mexico and Costa Rica, with additional nesting in Nicaragua, and forages in the Eastern Pacific Ocean. The Western Pacific population nest in tropical and subtropical latitudes primarily in Indonesia, Papua New Guinea, and Solomon Islands, and a lesser extent in Vanuatu. This population forages throughout the Western Pacific and Southeast Asian region, and migrates across the Pacific Ocean to forage in the Central and East Pacific. Nesting beaches that have been monitored consistently over time indicate nesting is declining by more than 5 percent annually. In the Eastern Pacific, nesting beach trends are mixed; however, the nesting beach in Costa Rica, Las Baulas, which hosts the largest majority of nesting females in recent decades has declined since the late 1980s as much as 15 percent each year. There may be

fewer than 2,500 reproductive females in the entire Pacific Ocean.

### Recovery Progress

Since the launch of the Species in the Spotlight initiative, partnerships have advanced implementation of the five-year priority actions plan for the Pacific leatherback. The plan focuses on five key actions to improve conservation efforts: (1) reduce interactions in fisheries, (2) improve nesting beach protection and increase reproductive output through outreach and community support, (3) cooperate with international partners to implement conservation measures and established agreements, (4) understand migratory habitats and pelagic threats to better implement mitigation measures, and (5) raise awareness and education of actions the public can take to support leatherback turtle conservation.

### Reduce Interactions in Fisheries

The United States is a party to two Regional Fisheries Management Organizations in the

Pacific—the Western Central Pacific Fisheries Commission (WCPFC) and the InterAmerican Tropical Tuna Convention (IATTC). While both Regional Fisheries Management Organizations have had sea turtle measures in place for the last decade, sea turtle bycatch has continued to be a significant cause of mortality for Pacific leatherbacks. Further, the IATTC measure does not require bycatch reduction measures in the long-line fleet and the WCPFC measure only applied to the shallow-set swordfish portion of the longline fleet (approximately 1 percent of vessels operating in the convention area). Through the U.S. leadership, the IATTC Bycatch Working Group has been reconstituted and is evaluating how to address leatherback bycatch in the eastern Pacific Ocean, and the WCPFC sea turtle measures have been amended to include all shallow-set longline fleets regardless of target species (approximately 20 percent of vessels operating in the convention area). Additional work is needed to expand these measures to deep-set longline fisheries.

**Improve Nesting Beach Protection and Increase Reproductive Output through Outreach and Community Support**

In the Eastern Pacific, the FWS, which is responsible for sea turtle recovery in terrestrial habitats, continues to support our partners’ efforts in Mexico and Costa Rica to protect critical leatherback nesting beaches. This ensures that beach surveys and anti-poaching efforts continue, as every hatchling and nesting female is vital for the survival of these populations. In the Western Pacific, NMFS and FWS have continued to support community-based projects in Papua Barat and Buru, Indonesia to protect leatherback nesting beaches and prevent poaching. In Buru this past year, the local community has passed anti-poaching ordinances to ban the direct killing of nesting females and collection of their eggs. Further, FWS is supporting a project in the Solomon Islands to improve leatherback nesting conservation and develop



**Pacific leatherback** (*Dermochelys coriacea*)

**Status:** Endangered

**Highlight:** Fewer than 2,500 reproductive females in the entire Pacific Ocean.

**Recovery Efforts**



Reduce Interactions in Fisheries — **Western Central Pacific Fisheries Commission now requires sea turtle conservation measures in shallow-set longline fleets regardless of target species**



Improve Nesting Beach Protection and Increase Reproductive Output through Outreach and Community Support — **Buru, Indonesia, passed anti-poaching ordinances to ban the direct killing of nesting females and collection of their eggs.**



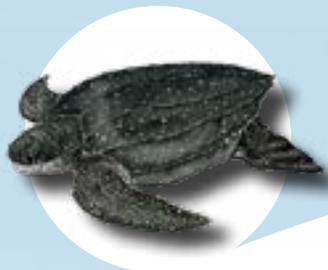
Cooperate With International Partners to Implement Conservation Measures and Established Agreements — **Promoted sea turtle conservation measures throughout the Pacific through several international treaties**



Understand Migratory and Pelagic Threats to Better Implement Mitigation Measures — **Continued to satellite tag and collect tissue samples to understand migration patterns and exposure to threats**



Raise Awareness and Education of Actions the Public Can Take to Support Leatherback Turtle Conservation — **Local partners in Buru, Indonesia, held workshop to develop a multi-year action plan for leatherback conservation on the island.**



a conservation action plan with the local community.

### **Cooperate With International Partners to Implement Conservation Measures and Established Agreements**

Partnerships are the cornerstone of our Pacific leatherback conservation efforts. The United States continues to work on a Memorandum of Understanding with the Government of Indonesia on leatherback conservation. Further, we have been actively engaged with many environmental NGOs around the Pacific. In the Western Pacific, we have worked closely with World Wildlife Fund (WWF) for Nature to understand take of sub-adult and adult animals in local villages and identify ways to monitor and reduce that take. In the Eastern Pacific, we worked with Red Laúd del Océano Pacífico Oriental to support their on the ground efforts to continue to protect vital nesting beaches, as well as document and address bycatch of leatherbacks in coastal and pelagic fisheries. Finally, throughout the Pacific, we have been promoting leatherback conservation measures in several of the

international treaties that we are a member of, such as the Inter-American Convention for the Protection of Sea Turtles (IAC), the IATTC, and the WCPFC.

### **Understand Migratory and Pelagic Threats to Better Implement Mitigation Measures**

NMFS Southwest Fisheries Science Center (SWFSC) sampled and tagged three leatherbacks with satellite-linked transmitters at foraging grounds located off the coast of central California during 2017–2018. Genetic analyses confirmed the turtles belonged to the Western Pacific breeding populations. The telemetry data provided information about movements across the Pacific by Western Pacific leatherbacks. Two tags were deployed in September 2017. Both turtles traveled in a southwest direction and eventually crossed the International Date Line as they proceeded towards known western Pacific nesting areas before transmissions ceased. One tag was deployed in September 2018. This turtle also travelled in a southwest direction from the deployment site but turned back toward the California Current after overwintering in the



Photo Credit: Scott Benson, NMFS

northeast equatorial Pacific. Transmissions ended approximately 650 miles WSW of the California coast. The turtle was expected to arrive in nearshore California waters by June/July 2019.

Leatherback tagging efforts have been identified as a critical source of information to reduce entanglement risk of this endangered species in fixed-gear fisheries that operate within key foraging areas within the species' ESA designated critical habitat along the U.S. west coast. Thus, the tagging and sampling techniques developed by NMFS SWFSC are proving to be essential for mitigating threats to this leatherback population, and future support of such telemetry and stock identification efforts will be essential for continued mitigation of threats to this still-declining population.

Genetic analysis of samples from the eastern Pacific, collected by partners in Chile and Peru, determined that while most of the leatherbacks interacting with artisanal driftnet fisheries and commercial longline fisheries originated from nesting populations in the eastern Pacific (Mexico and Costa Rica), some (about 13 percent) originated from the western Pacific. New genetic analysis completed in 2018–19 now allows a more precise assignment of individual bycaught turtles to nesting populations in Papua New Guinea, Solomon Islands and Papua, Indonesia. This work is ongoing and will inform threats assessments. The NMFS SWFSC and Pacific Islands Fisheries Science Center (PIFSC) are developing partnerships in the western Pacific to build in-country technical capacity to conduct future genetic analysis with standardized markers developed by the SWFSC.

NMFS PIFSC researchers trained local Indonesian WWF staff members on best practices and protocols to tag nesting leatherback sea turtles. During October 2018, the WWF team tagged two female

leatherbacks on Buru nesting beaches with satellite-linked transmitters. Telemetry data showed that the two nesting females generally stayed in offshore coastal waters before returning to nest in the same area. Several subsequent nesting events by these two females may have occurred outside of the monitored beaches, indicating a need to expand the monitoring program on Buru Island. After nesting, both females migrated across the Banda Sea to the coastal waters of East Nusa Tenggara. Tagging nesting females continues through the 2019 summer nesting season. Additionally, monitoring of direct leatherback take in the Kei islands was continued by WWF in partnership with the NMFS PIFSC and Regional Office. During the period of July – December 2018, the team documented 24 leatherback turtles caught in Kei Islands. Work is in progress to strengthen the monitoring program and create collaborations with the local villages to reduce the direct take of foraging leatherbacks off the Kei islands.

### **Raise Awareness and Education of Actions the Public Can Take to Support Leatherback Turtle Conservation**

To galvanize governmental and community support for leatherback conservation initiatives, local partners held a Workshop of Sea Turtle Conservation on the island of Buru, Indonesia in 2018. The partners invited provincial level government agencies, local village elders, and community members to discuss issues that threaten wildlife conservation efforts on Buru Island. The workshop culminated in a multi-year action plan for leatherback conservation on the island. This plan included local and village government roles in encouraging protection activities at the regency to village levels. This plan also provided outreach activities throughout the four villages to support the cessation of illegal take and to reduce predation of eggs through the formation of a Community Watch Group.



### Other Recovery Progress

In addition to the substantial work NMFS and FWS have undertaken with our partners, we have also strengthened our internal multi-agency coordination on Pacific leatherback conservation. This included convening a planning meeting in May 2018 to discuss the highest priority projects to support the five key areas in the five-year priority actions plan for the Pacific leatherback.

### Summary

Key accomplishments, to date, include strengthening sea turtle bycatch reduction measures through the WCPFC, working with NGO partners in Indonesia to monitor nesting activity, increasing hatchling production, reducing directed take of turtles and their eggs, and continuing to support long-term

leatherback nesting beach conservation projects throughout the Western and Eastern Pacific. Efforts have also been continuing along the Central California Coast, where NMFS researchers have conducted aerial surveys to monitor density, distribution, and abundance, as well as satellite telemetry efforts to track at-sea movements of individual leatherbacks. These studies are important for understanding and mitigating risks, and assessing population trends.

Over the next few years, NMFS and FWS and their network of partners will continue to work together to address the five key areas in the five-year priority actions plan for the Pacific leatherback. By continuing to build strong partnership networks, we hope to reverse the decline of Pacific leatherbacks.



Photo Credit: Brian Skerry, National Geographic Magazine

## PARTNER in the SPOTLIGHT: Red Laúd del Océano Pacífico Oriental

---

Eastern Pacific leatherback sea turtles range from the tip of Chile through the waters of the western United States and Canada. While principally nesting in Costa Rica and Mexico, they are found in the coastal and pelagic environments of all the countries of the Eastern Pacific. Given the precipitous decline in nesting over the past few decades, information collection, data sharing, and coordinated conservation action is critical to reverse this trend. Over the last decade, the Eastern Pacific Leatherback Network, or Red Laúd del Océano Pacífico Oriental (Laud OPO) in Spanish, has brought together scientists and conservation practitioners across the Eastern Pacific to compile and synthesize key nesting and fisheries bycatch data. The Laud OPO network initiated a regional bycatch assessment. Based on this information, Laud OPO has identified the most critical conservation actions to be taken. The actions that Laud OPO has identified have informed local and national governments. Further, representatives from the Laud OPO network have worked to educate international treaty organizations such as the IAC and the IATTC. Because of the perseverance of the members of Laud OPO, the IAC Parties have adopted a resolution on the Conservation of Eastern Pacific Leatherback turtle. From there, the IAC Secretariat and members of the Laud OPO network have worked together to provide critical information to the IATTC on the need for reducing Eastern Pacific leatherback fisheries bycatch.

Laud OPO has served as a critical link from local conservation groups to national and international organizations. Through the Laud OPO network, the tireless work of many scientists and conservationists to save Eastern Pacific leatherbacks is amplified to the larger international community.



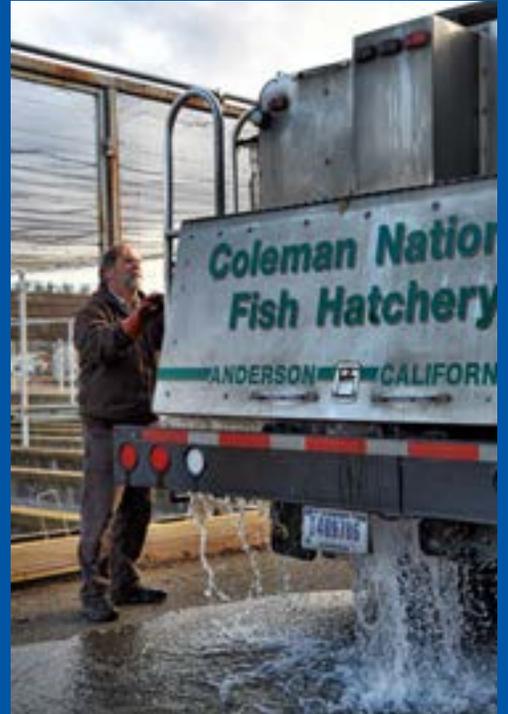
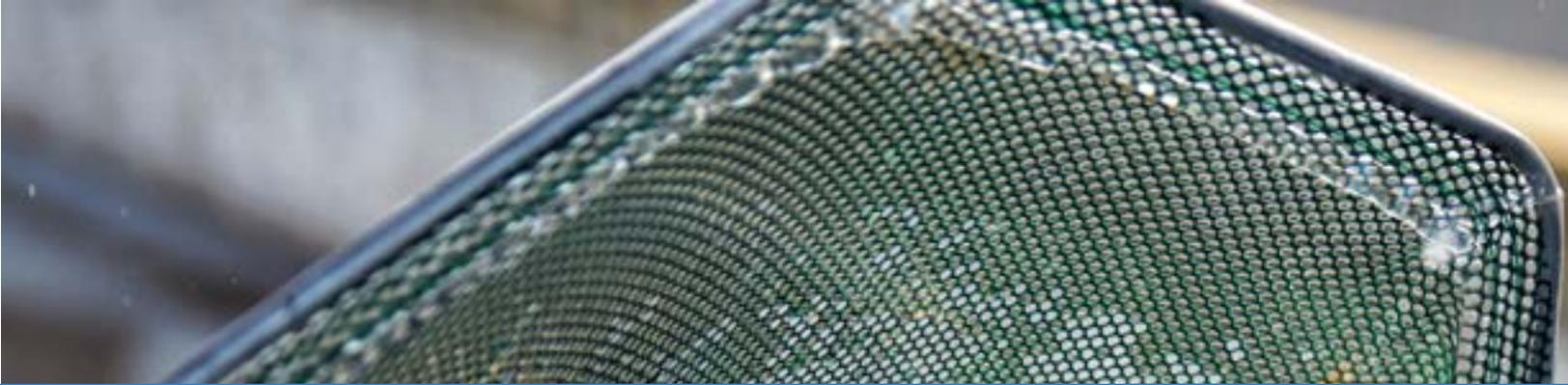


Photo Credit: FWS (left, middle, right, and section cover)



# SPECIES *in the* SPOTLIGHT



Sacramento River Winter-Run  
Chinook Salmon ESU





Photo Credit: FWS

Chinook salmon (*Oncorhynchus tshawytscha*), commonly known as king salmon, are an iconic part of California's natural heritage and their recovery will help ensure the economic and recreational well-being of future generations. Endangered Sacramento River winter-run Chinook salmon are particularly important among California's salmon runs because they exhibit a life history strategy found nowhere else. These Chinook salmon are unique because they spawn during the summer months when air temperatures usually approach their warmest. As a result, winter-run Chinook salmon require stream reaches with cold-water sources to protect their incubating eggs from the warm ambient conditions.

Because of this need for cold water during the summer, winter-run Chinook salmon historically spawned only in rivers and creeks fed by cold water springs, such as the Little Sacramento, McCloud, and Pit Rivers, and Battle Creek.

The construction of Shasta and Keswick Dams eliminated access to the Little Sacramento,

McCloud, and Pit Rivers, extirpating the winter-run Chinook salmon populations that spawned and reared there. The fish from these three different populations above Shasta Dam were forced to mix and spawn as one population downstream of Keswick Dam on the Sacramento River. Construction and operation of hydropower facilities in Battle Creek made the creek inhospitable to winter-run Chinook salmon, which resulted in extirpation of the population from that area.

Today, only the one population of winter-run Chinook salmon that spawns downstream of Keswick Dam exists. Over the last 10 years of available data (2009–2018), the population's abundance of spawning adults ranged from a low of 827 in 2011 to a high of 6,084 in 2013, with an average of 2,733. The earliest abundance data comes from the late 1960s when up to 117,000 winter-run Chinook salmon spawning adults were estimated. The population crashed in the 1970s and has persisted in large part due to managed cold-water releases from Shasta Reservoir from the spring through the fall, and artificial propagation from Livingston Stone National

Fish Hatchery's winter-run Chinook salmon conservation program. Thus, winter-run Chinook salmon are dependent on sufficient cold water storage in Shasta Reservoir, and it has long been recognized that a prolonged drought could have devastating impacts, possibly leading to the species' extinction.

### Recovery Progress

Since the launch of the Species in the Spotlight initiative, there has been substantial progress on winter-run Chinook salmon recovery efforts, including advancement of each of the five key actions in the five-year priority actions plan: (1) improve management of Shasta Reservoir cold-water storage, (2) restore Battle Creek and reintroduce winter-run Chinook salmon, (3) reintroduce winter-run Chinook salmon into McCloud River, (4) improve Yolo Bypass fish habitat and passage, and (5) manage winter and early spring Sacramento-San Joaquin River Delta conditions to improve juvenile survival.

### Improve Management of Shasta Reservoir Cold-water Storage

The NMFS SWFSC has made substantial progress on water temperature modeling and biological models over the past three years. This includes a physical model of Shasta Reservoir that has been coupled with a Sacramento River model. Together, these models can provide seasonal forecasts of water temperature in the Sacramento River and the associated impacts on cold-water storage in Shasta Reservoir.

The NMFS SWFSC also developed a novel egg mortality model to discern how water temperatures are expected to affect Chinook salmon egg survival. This model of temperature-dependent mortality for Chinook salmon embryos is different from previous models in that thermal tolerance parameters were estimated using observed field egg-to-fry survival data, rather than assuming thermal tolerance parameters measured



## Chinook Salmon (*Oncorhynchus tshawytscha*)

**Status:** Endangered

**Highlight:** On average, 2,733 adults return to spawn annually

### Recovery Efforts



Improve Management of Shasta Reservoir Cold-water Storage — **Progressed substantially on water temperature and biological modeling to improve seasonal forecasts and cold-water storage management**



Restore Battle Creek and Reintroduce Winter-Run Chinook Salmon — **Reintroduced approximately 380,000 salmon into Battle Creek**



Reintroduce Winter-Run Chinook Salmon into McCloud River—**California has made considerable progress in designing and constructing various components of the juvenile salmon collection system for Shasta Reservoir.**



Improve Yolo Bypass Fish Habitat and Passage — **The Wallace Weir Fish Rescue Project was completed, preventing adult salmon from straying into agricultural ditches and allowing them to be rescued from the Yolo Bypass so they can be returned to the Sacramento River**



Manage Winter and Early Spring Delta Conditions to Improve Juvenile Survival — **Acoustically tagged winter-run Chinook salmon juveniles in winter and spring of 2016 and 2017, providing real-time fish distribution information to help managers make more protective water management decisions**



in laboratory studies. NMFS found strong evidence that significant thermal mortality occurred during the egg stage in some years due to a ~5°F reduction in thermal tolerance in the field compared to laboratory studies. Using the new egg mortality model coupled with the reservoir and river temperature models to guide management contributed to improved survival following the historic drought from 2012 through 2016.

Coming off that drought, in addition to using the new egg mortality model, the U.S. Bureau of Reclamation (BOR) implemented a pilot temperature project to target cooler water temperatures closer to where the winter-run spawned in 2016, 2017, and 2018, resulting in estimated egg-to-fry survival of 24 percent, 44 percent, and 26 percent, respectively. The long-term (2002–2018) average survival is 24 percent, with lows of approximately 6 percent and 4 percent egg-to-fry survival experienced in 2014 and 2015, respectively. The 44 percent egg-to-fry survival in 2017 was second highest since 2002 (the highest egg-to-fry survival since 2002 was 49 percent in 2011), resulting from an abundant water

resource in one of the wettest water years on record.

### **Restore Battle Creek and Reintroduce Winter-Run Chinook Salmon**

In March 2018, winter-run Chinook salmon were reintroduced into Battle Creek, initiating a long-term effort to establish another population of winter-run Chinook salmon. To jump start the reintroduction effort, approximately 200,000 hatchery-reared winter-run Chinook salmon were released into newly restored habitat in the North Fork of Battle Creek. The reestablishment of fish in this waterway occurred sooner than expected due the availability of fish from the Livingston Stone National Fish Hatchery winter-run captive broodstock program. Each year approximately 1,000 fish are retained in the hatchery and raised to adults for breeding. Fortunately, in 2017 there were enough spawning adults in the river so the captive broodstock at the hatchery was not required to sustain the population. Resource managers from the Battle Creek Salmon and Steelhead Restoration Program, composed of the CDFW, the FWS, BOR, NMFS, and the Pacific Gas and



Photo Credit: FWS



Photo Credit: FWS

Electric Company saw the extra broodstock as an exceptional opportunity to expand the current range of the fish and help in its recovery. All of the juvenile salmon are tagged and fin clipped prior to release, allowing resource managers to track their survival, growth and ocean distribution, as well as to detect them when they return to Battle Creek.

In March 2019, the reintroduction “jump-start” was repeated when approximately 180,000 more winter-run Chinook salmon from the hatchery were released into Battle Creek.

The successful release of these fish in 2018 and 2019 was the culmination of many years of planning and cooperation in rearing the fish and in restoring their habitat. This is a significant milestone toward the recovery of endangered Sacramento River winter-run Chinook salmon.

### **Reintroduce Winter-Run Chinook Salmon into McCloud River**

In 2018, BOR awarded the California Department of Water Resources (CDWR) \$2.7

million as the first installment of a 5-year contract totaling approximately \$9 million for the design, construction, installation, and operation of two juvenile fish collection devices in the lower McCloud River and the McCloud arm of Shasta Reservoir. Under this contract, CDWR has made considerable progress in designing and constructing various components of the juvenile collection system—specifically guidance nets, debris booms, and a thermal curtain. The components are ready for deployment, pending completion on environmental compliance documents.

### **Improve Yolo Bypass Fish Habitat and Passage**

Two more milestones for improving Yolo Bypass fish habitat and passage were reached in 2017 and 2018. The Wallace Weir Fish Rescue Project was completed in 2017 and is operational. The project was championed by Sacramento Valley farmers (BOR District 108) in partnership with The Sacramento River Salmon Recovery Program and state and federal support. The project prevents adult winter-run Chinook salmon from straying into Colusa Basin agricultural ditches and allows



Photo Credit: FWS

them to be rescued from the Yolo Bypass so they can be returned to the Sacramento River. The project includes replacing a seasonal earthen dam at Wallace Weir with a permanent, operable structure that would provide year-round operational control, and constructing a fish rescue facility.

In 2019, the Fremont Weir adult fish ladder was completed and became operational, providing a vital fish passage route for adult winter-run Chinook salmon migrating up the Yolo Bypass to return to the Sacramento River where they can reach their spawning habitat.

#### **Manage Winter and Early Spring Delta Conditions to Improve Juvenile Survival**

The Collaborative Adaptive Management Team Salmon Scoping Team Gap Analysis Report was completed in January 2017. This report provides research direction by identifying gaps in the current understanding of water project-

linked effects on juvenile salmonid survival in the south Sacramento-Joaquin River Delta.

The Interagency Ecological Program comprised of seven agency directors requested a multi-agency technical team develop a focused framework for winter-run salmon monitoring. A report was completed in July 2016, and several of the recommendations for improved data generation and reporting have been implemented since 2017.

CDWR and BOR are designing a bio-acoustic fish fence at the Georgiana Slough-Sacramento River junction to guide juvenile winter-run away from relatively high mortality in the central Delta. The design is almost complete, and CDWR anticipates installation in early 2021.

The NMFS SWFSC completed a winter-run life cycle model that can evaluate how climate change and different water project operations

and management actions (harvest, habitat restoration), influence the long-term viability of winter-run Chinook salmon. It has been applied in the development of a biological opinion on California Water Fix, a science-driven upgrade to California's aging water system. Improvements to the enhanced particle-tracking model for the Delta component of the life cycle model were made in 2016 and continue to be refined. NMFS is also using the model in the biological opinion on the reinitiation of consultation on the long-term operation of the California State and Federal water projects.

Acoustically tagged winter-run Chinook salmon juveniles were tracked in winter and spring of 2016 and 2017. The tagged salmon provide real-time fish distribution information to help managers determine the survival of the juveniles from their release location in Redding through Chipps Island in the western Delta. This study has revealed that juvenile winter-run Chinook have much higher survival rates during high flow conditions that occur during wet winters.

### Other Recovery Progress

The NMFS SWFSC in collaboration with the Metropolitan Water District of Southern California, the University of California at Davis, and the Lawrence Livermore National Laboratory found that 44–65 percent of surviving adult winter-run Chinook salmon reared in non-natal habitats as juveniles. Most of these non-natal habitats were not previously known to be important for winter-run Chinook salmon recovery.

The NMFS SWFSC has also developed a new model for forecasting the ocean abundance of winter-run Chinook salmon. The ocean abundance forecast is a function of adult returns to the river in previous years and river temperatures experienced by eggs, and is used by the Pacific Fishery Management Council to design commercial and recreational

fishery seasons that maintain impacts on winter-run Chinook below limits specified in the Biological Opinion on those fisheries. Fishery management will now reduce impacts during droughts, whereas the older system did not provide protections until after reduced egg survival due to drought was apparent in adult population declines.

### Summary

The 2015 launch of the Species in the Spotlight initiative for winter-run Chinook salmon came during the worst drought on record in California. California experienced well below average precipitation from 2012 through 2015, record high surface air temperatures in 2014 and 2015, and record low snowpack in 2015. The four-year period between fall 2011 and fall 2015 was the driest since record keeping began in 1895 and some paleoclimate reconstructions suggest that this recent drought was the most extreme in the past 500 or perhaps more than 1,000 years. Not surprisingly, for a species dependent on ample cold water, the 2014 and 2015 year classes were nearly wiped out due to high water temperatures and the overall viability of winter-run Chinook salmon decreased during the drought. However, the impact could have been worse if not for major efforts to protect winter-run Chinook salmon. In particular, water temperature management supported by strong science from the NMFS SWFSC greatly increased egg-to-fry survival in 2016. Additionally, hatchery production from Livingston Stone National Fish Hatchery was increased during the drought to buffer against low adult returns resulting from poor survival of the 2014 and 2015 year classes. This buffering was successful, and adult escapement through 2018 met the low extinction risk criterion for abundance. However, while winter-run Chinook salmon abundance was bolstered with increased hatchery production, the population's diversity was subsequently diminished by the additional influence of hatchery-origin fish spawning in the wild.



Substantial progress to protect winter-run Chinook salmon has been made over the last few years, and despite the historic drought's impacts on the population, there are reasons for hope. First, the adverse conditions for winter-run Chinook salmon caused by the drought ended with an extremely wet 2016/2017 winter, which contributed to improved spawning success and juvenile survival. The wet 2018/2019 winter also bodes well for winter-run Chinook salmon—a snow survey in April 2019 revealed a snowpack at 162 percent of the long-term average, thanks to more than 30 atmospheric river storms that swept across the state over the winter. This wet pattern continued into the spring and as of June 2019 the amount of snow blanketing the Sierra Nevada is 202 percent of average,

even larger than the 2017 snowpack that pulled California out of a five-year drought. Second, a positive outcome of having just experienced the drought, is that science, modeling, and decision making improvements have better prepared Shasta Reservoir water temperature managers for protecting winter-run Chinook salmon through the next drought. Third, benefits of restoring Battle Creek and the Yolo Bypass will soon be realized, and both have the potential to greatly move the needle towards winter-run Chinook salmon recovery. Lastly, an accelerated pace of restoration in the Sacramento River continues due to significant partnerships among the Northern California Water Association, TNC, Cal-Trout, American Rivers, and state and federal agencies.



Photo Credit: FWS

## PARTNER in the SPOTLIGHT: Randi Field, BOR

Randi Field with the BOR's MidPacific Region is responsible for operation of the largest reservoir in California— Shasta reservoir. Shasta reservoir stores up to 4.5 million acre feet of water that meets critical water supply needs for farms and cities, and must maintain key conditions for drinking water quality and fish protection throughout California. Winter-run Chinook salmon eggs and emergent fry are vulnerable to summer heat. They persist because of the careful operations of the limited cold-water pool deep in Shasta Reservoir. Improved management of Shasta Reservoir Coldwater Storage is a key action in the five-year priority actions plan. With Randi in the lead, BOR successfully completed two “operational study” years in 2017 and 2018, demonstrating management to a new temperature regime with positive results on egg and fry survival.

Furthermore, in an extraordinary commitment to survival of this endangered species, Randi took swift action as the uncontained Summer 2018 Carr fire swept towards and burned over the Sacramento River—in the location of vulnerable salmon redds. As BOR staff scrambled to protect Shasta Reservoir infrastructure and ensure safety of employees, Randi quickly and expertly gave instructions on temperature control operations that could be locked in place as the facilities were evacuated. Thanks to her expertise and quick action, suitable temperatures in the river for salmon were maintained, while the fire continued to advance in an uncontained state, before it was eventually controlled.



Photo Credit: Bureau of Reclamation



Photo Credit: NMFS Permit #19091 (above left and section cover), Soundwatch NMFS Permit #21114 (above middle), Lynne Barre, NMFS (above right)



SPECIES *in the* SPOTLIGHT



Southern Resident Killer Whale





A Southern Resident killer whale capturing a salmon in September 2018. Image collected by scientists from SeaLife Response, Rehabilitation and Research (SR3) and NMFS SWFSC, during research with an unmanned drone flying >100ft under NMFS research permit #19091.

Southern Resident killer whales (*Orcinus orca*) are one of the most endangered whales with only 74 whales in the population at the end of 2018, the fewest since the mid-1980s. The continued population decline highlights their challenges with survival and reproduction and the population's risk of extinction. The killer whales caught the world's attention in the summer of 2018, with the media and public following the story of J35, also known as Tahlequah, an adult female who gave birth to a calf that died immediately. The world watched with a heavy heart as J35 carried her dead calf for more than two weeks. Sharing the spotlight was J50, an ailing three-year-old calf also known as Scarlet. NMFS and partners initiated an emergency response to provide remote medical treatment to J50, but she eventually disappeared after declining dramatically in body condition. No other calves that were born in 2017 or 2018 survived and the population lost two individuals in each of 2017 and 2018.

### Recovery Progress

Since the launch of the Species in the Spotlight initiative, there has been substantial progress on the five key actions in the five-year priority actions plan for the Southern Resident killer whale: (1) protect killer whales from harmful vessel impacts through enforcement, education, and evaluation, (2) target recovery of critical prey, (3) protect important habitat areas from anthropogenic threats, (4) improve our knowledge of Southern Resident killer whale health to advance recovery, and (5) raise awareness about the recovery needs of Southern Resident killer whales and inspire stewardship through outreach and education.

### Protect Killer Whales from Harmful Vessel Impacts through Enforcement, Education, and Evaluation

The response to J50 and J35 helped get messages to boaters to give more space to the whales, particularly the most vulnerable

individuals. Ongoing efforts to protect the whales from harmful vessel impacts through enforcement, education, and evaluation incorporated new information and expanded actions. Research results from NMFS Northwest Fisheries Science Center digital acoustic tagging (Dtag) project provide a window into the underwater diving and foraging behavior of the whales and how they are impacted by vessels at different speeds and distances. In 2018, the Dtag project took on a new element, with eight successful tag deployments to explore the whales' behavior at night in collaboration with Canada Department of Fisheries and Oceans' study of Northern Resident killer whales.

In 2017, we completed a review of federal vessel regulations established in 2011 and have been working with partners to implement recommendations from the review to foster better compliance with the regulations and Be Whale Wise guidelines. New initiatives such as whale warning flags, expansion of the voluntary no-boat zone in partnership with Washington Department of Fish and Wildlife (WDFW), the Pacific Whale Watch Association, and San Juan County, and encouraging boaters to turn echosounders off when safe to do so went into effect in 2018. Increased capacity for vessel research and boater education through National Fish and Wildlife Foundation (NFWF) grants and support for additional enforcement through the Washington Task Force (see the following Partner in the Spotlight story), are also helping protect the whales during busy summer boating seasons. To address impacts from larger ships, NMFS serves on advisory and technical working groups for a transboundary, industry-led program, called ECHO (Enhancing Cetacean Habitat and Observations) working to understand and manage the impacts of shipping activities. In 2017 and 2018, ECHO spearheaded voluntary slow-down and displacement trials for ships to reduce noise near key foraging areas.



## Southern Resident killer whales

(*Orcinus orca*)

**Status:** Endangered

**Highlight:** 74 whales in the population at the end of 2018

### Recovery Efforts



Protect Killer Whales from Harmful Vessel Impacts through Enforcement, Education, and Evaluation — **Completed a review of federal vessel regulations and worked with partners to implement recommendations from the review**



Target Recovery of Critical Prey — **Completed an assessment of Chinook salmon stocks that the whales depend on for growth and reproduction to inform salmon management**



Protect Important Habitat Areas from Anthropogenic Threats — **Proposed expansion of designated critical habitat to include coastal waters.**



Improve Our Knowledge of Southern Resident Killer Whale Health to Advance Recovery — **Developed metrics to assess trends in body condition, growth, and pregnancy and embarked on a new partnership to sequence the full genomes of 101 whales.**



Raise Awareness About the Recovery Needs of Southern Resident Killer Whales and Inspire Stewardship through Outreach and education — **Worked with Killer Whale Tales and others to expand education program: in two years, Killer Whale Tales reached over 16,000 students at 263 schools and events**



### Target Recovery of Critical Prey

Sufficient salmon prey is essential to recover the Southern Resident population. Knowing where and when the whales are most food-limited and which salmon stocks they eat and overlap with throughout their range helps target recovery of salmon stocks that will most benefit the whales. In 2018, NMFS and WDFW, with input from tribal organizations, NGOs, and Canada's Department of Fisheries and Oceans took a major step forward in understanding the whales' prey needs by completing an assessment of priority Chinook salmon stocks to inform salmon management and conservation actions. Information collected by NMFS on the whales' diet and distribution, as well as the distribution of salmon stocks, was essential for this analysis. A NFWF workshop advanced a final prey report, which is helping prioritize funding decisions and actions across a range of activities, such as hatchery adjustments and habitat restoration to support Chinook from high priority runs. NMFS works on these and other salmon regulatory and recovery actions related to hydropower passage, harvest

management, and predation of ESA-listed salmon to support recovery and ensure sufficient prey for the Southern Residents (see inset box).

In 2017 and 2018, the NFWF Killer Whale Research and Conservation Program funded several Chinook salmon habitat improvement projects, while also investing in tools to advance our knowledge of the whales' diet, coastal occurrence, and nutritional status. The prey priority report informed selection of NFWF grants in 2018 and was highlighted in the PCSRF request for proposals to prioritize Species in the Spotlight (salmon and whales). In 2019, NMFS will coordinate with the Governor's Task Force on its recommendations and will continue to collaborate as new salmon initiatives are implemented through existing partnerships up and down the West Coast. We will also work with the Pacific Fishery Management Council as well as state and tribal co-managers to incorporate information on the whales' body condition, population status, distribution and diet to evaluate risks from coastal and inland



Photo Credit: Brad Hanson NMFS

Examples of conservation and management actions to support salmon recovery that have multi-species benefits and are increasing prey for the whales.

- **Habitat:** NMFS is working with partners in the Skagit Watershed to advance restoration actions that have the highest potential to increase Chinook smolt capacity of the system and provide flood risk reduction while minimizing impacts to agriculture. Monitoring results from 2017–2018 at the Fir Island Farm Estuary Restoration Project, which was completed in 2016 in partnership with WDFW, showed that the 131-acre project can now support an additional 64,400 Northern Puget Sound Chinook smolts. NMFS also worked with the COE to advance fish passage at Howard Hanson Dam east of Tacoma. The addition of downstream fish passage will allow the ESA-listed fish to access over 100 miles of additional habitat above the dam that will support spawning and rearing of Puget Sound Chinook salmon and steelhead prey for the whales and sustain tribal, recreational, and commercial fisheries.

- **Hatcheries:** NMFS is currently working to review Hatchery and Genetic Management Plans in Puget Sound that reflect increased hatchery production to serve as prey for Southern Resident Killer Whales. These efforts require coordination with Tribal and state co-managers to ensure plans will not interfere with recovery of ESA-listed salmon.



- **Harvest:** In 2018, Canada and the United States reached a new 10-year agreement under the terms of the Pacific Salmon Treaty. The agreement includes harvest reductions for Chinook fisheries in both countries that will help protect a variety of stocks that are important to the whales while providing sustainable harvest opportunities for First Nations, Indian Tribes, and commercial and recreational fishers.

- **Hydropower:** In the Columbia River basin NMFS approved “Flexible Spill” operations for eight lower Snake and lower Columbia River dams, which have the potential to reduce hypothesized latent mortality effects, improve juvenile survival, and increase adult abundance of multiple runs of Chinook salmon available to the whales.

salmon fisheries and inform development of management tools and conservation measures.

### **Protect Important Habitat Areas from Anthropogenic Threats**

Currently, critical habitat for the whales is designated only in the core summer range in the Salish Sea. However, the whales spend most of the winter and a substantial portion of all seasons in outer coastal waters traveling, foraging, and socializing from Monterey, California, to Southeast Alaska. Over the last two years, NMFS pulled research results together from satellite tags, acoustic recorders, sightings, and sampling to inform a revision of critical habitat to protect coastal waters. A proposal for new critical habitat

areas (in addition to the existing critical habitat in inland waters of Washington) is due out for public comment in 2019. Understanding how the whales are using their coastal range helps us understand patterns in response to changing environmental conditions and protect important habitat areas from anthropogenic threats.

### **Improve Our Knowledge of Southern Resident Killer Whale Health to Advance Recovery**

Drone images collected by NMFS SWFSC, Sealife Response, Rehabilitation and Research, and Vancouver Aquarium are bringing new insights to our knowledge of Southern Resident killer whale nutritional health, which will advance recovery.



Photo Credit: NMFS

Successful field seasons in 2017 and 2018, with NFWF support, helped build a data set that now spans a decade. NMFS and our partners have analyzed new metrics, such as measurements of fat deposits around the head, to evaluate seasonal and annual trends in body condition, growth, and pregnancy. Declines in body condition for a number of individuals over time, particularly in J pod, have correlated with mortalities and abundance trends. Several pregnancies were detected through photogrammetry in 2017 and 2018, and while no new calves survived in 2018, there is hope that reproductive success will improve.

Researchers are currently developing models to formally relate body condition to population dynamics and examine trends in relation to environmental variables, such as Chinook salmon abundance, to inform

salmon conservation and management. Non-invasive photogrammetric assessment of body condition has become a powerful tool to monitor the nutritional health of the whales and inform new risk assessment methods and adaptive management frameworks to evaluate the effects of actions that can change the prey available to the whales.

Ongoing research on the health of all the whales has provided baseline information for comparison with compromised individuals and other killer whale populations. NMFS researchers are investigating the medical condition of individual whales, including the presence of pathogens and parasites and unraveling the complex microbiomes (bacteria, fungi, and viruses) on the skin and in respiratory and digestive tracts to better understand the role disease may be playing in reproductive success and survivorship.

NMFS, TNC, and BGI, a leader in genomics research, embarked on a new partnership in 2018 to sequence the full genomes of 101 killer whales. Cutting-edge genetic technology will provide information on the degree to which inbreeding affects the health, growth and survival of individual whales. Samples from free-swimming whales and stranding investigations inform us about the natural threats the whales face in their environment and how human activities may contribute to the poor survival and reproduction seen for the Southern Residents in recent years.

### **Raise Awareness About the Recovery Needs of Southern Resident Killer Whales and Inspire Stewardship through Outreach and Education**

Public awareness of the status of the whales and the threats they face is essential to the conservation of at-risk species. The Species in the Spotlight initiative has created a new campaign to spread messages about the whales through social media, videos, and web pages. Even more importantly, we are developing partnerships that raise awareness about the whales and support conservation with new audiences. Many partners inspire stewardship of the whales and their habitats by educating concerned citizens about actions they can take to help recover the whales.

NMFS has long-standing partnerships with education and outreach experts at institutions in the region, such as The Whale Museum and Seattle Aquarium. In 2017 and 2018, new opportunities and partnerships have helped expand the reach of several education programs. Reaching students and their families is an important way to ensure Southern Residents will have stewards into the future. NMFS worked with the Seattle Aquarium and Killer Whale Tales, a classroom program inspiring students and their families to take an active role in conservation, to update colorful

and educational trading cards. Kids were especially interested in collecting the J35 and J50 cards, as well as their J pod families and other favorite whales in the population. Killer Whale Tales distributed trading cards full of whale facts and conservation messages, which were a powerful incentive to complete homework assignments, helping students and families reduce their environmental footprints. In 2017 and 2018, Killer Whale Tales reached over 16,000 students at 263 schools and events. In 2017, a NOAA Hollings Ocean Awareness grant supported land-based viewing at Whale Trail sites throughout the Southern Residents' range to engage the public and support broad conservation.

### **Other Recovery Progress**

Local, state, federal, and international partners continued to support recovery in 2017 and 2018, implementing actions from NMFS 2008 Southern Resident killer whale recovery plan, our Species in the Spotlight five-year priority actions plan, the Washington Executive Order (see the following Partner in the Spotlight story), and Canada's Oceans Protection Plan. These plans are complementary, coordinated, and cover a broad suite of actions addressing the key known threats and increasing our scientific knowledge. The new Governor's Task Force drew on these existing plans for Southern Residents, NMFS ESA recovery plans for salmon, and Puget Sound clean-up efforts to guide development of recommendations to support recovery. In addition to planning for the future, over the last two years we have made progress on developing new partnerships, building external funding resources, and implementing a variety of ongoing research and conservation activities.

### **Summary**

Over the past two years, we have continued to improve our understanding of and ability to protect this unique population. Despite the



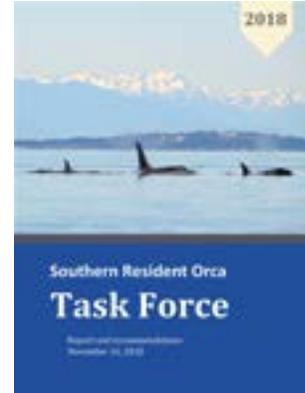
work of our scientists and regional partners to make progress on the key actions identified in the Southern Resident killer whale five-year priority actions plan, the population has not grown and in fact has declined in abundance since it was first listed under the ESA. We clearly still have important work to do locally, with our federal capabilities, and working internationally to bring Southern

Resident killer whales back from the brink of extinction. With new public awareness from last summer's events and through new efforts by the Governor's Task Force and in Canada, there is strong positive momentum to identify resources, make commitments, and follow through on strong actions that will benefit the whales and their prey and benefit the ecosystem.



Photo Credit: Lynne Barre, NMFS

## PARTNER in the SPOTLIGHT: Washington State Southern Resident Killer Whale Task Force



In 2018, Governor Jay Inslee emerged as a leader bringing state authorities, significant investments, and new members of the community to the ongoing fight to recover the iconic Southern Resident killer whales. He signed an Executive Order directing state agencies to take immediate actions to benefit Southern Residents and setting up a Task Force that developed recommendations for additional short- and long-term actions. This Task Force process highlighted the urgency for action, raised awareness, brought diverse stakeholders together, and resulted in a new commitment from Washington State as a leading partner in recovery of the Southern Residents. This unprecedented step recognized the whales' endangered status, declining population trend, and risk of extinction from three primary threats— insufficient prey, high levels of contaminants, and disturbance from vessels and sound- which landed them as a Species in the Spotlight in 2015.

The Task Force brought together key partners in Washington, including co-chairs Stephanie Solien and Les Purce and nearly 50 members representing a wide range of sectors from state agencies; the state legislature; tribal, federal, and local governments; the whale watching industry; and non-profit organizations to provide expertise and variety of perspectives. Three technical working groups were appointed to focus on each of the main threats. The working groups reviewed existing scientific information and provided initial suggestions and evaluations of recommendations that then went to the Task Force for consideration and discussion. They drew on existing plans for Southern Residents, as well as plans for salmon recovery and Puget Sound restoration efforts, to guide development of recommended action steps to support recovery. NMFS participated on the Task Force and the working groups to provide our latest research, technical expertise, and experience from over a decade of implementation of our ESA Recovery Plan for Southern Residents. The Task Force also heard from many members of the public who attended the six Task Force meetings and provided thousands of comments.

The Task Force submitted a report to the Governor including 36 recommendations spanning regulatory, voluntary, enforcement, research, and outreach activities, many of which required specific legislation and funding to implement in Washington. The report acknowledged NMFS and other federal agencies actions to identify where the state can complement such actions. The Governor's office then moved forward in identifying specific actions to implement and asked for unprecedented state investment to support recovery efforts. His operating, capital, and transportation budgets requested for 2019–2021 included a combined \$1.1 billion in investments to help Southern Residents and complement ongoing federal, state and local efforts to recover salmon. In 2019 the legislative and budget process, as well as the second year of the Task Force, will unfold providing new opportunities for partnerships and actions. Governor Inslee, the Task Force chairs and members, working groups, and public participants all deserve recognition for shining a brighter and bolder spotlight on Southern Resident killer whales, aggressively championing their cause, and engaging residents in opportunities to contribute to the whales' recovery.



Photo Credit: Kevin Stolzenbach (left), Kristin Aquilino, Bodega Marine Laboratory (above middle and right), David Witting, NOAA RC (section cover)



# SPECIES *in the* SPOTLIGHT



White Abalone





Photo Credit: Cabrillo Marine Aquarium

White abalone (*Haliotis sorensen*) are herbivorous marine snails that historically occupied subtidal rocky reef habitats from Point Conception, California to Central Baja California, Mexico, and the offshore islands and banks. White abalone are thought to help sustain the health and diversity of kelp forest ecosystems through competition for food and space with species like urchins and brittle stars that can decimate kelp forests when ecosystems are imbalanced. Sexes are separate, and gametes are released freely into the ambient sea water during reproduction. Males and females must be in close proximity for successful fertilization to occur and recruitment events are likely episodic. White abalone are estimated to live a minimum of 30 years.

White abalone supported a brief but intense and profitable commercial fishery in southern California during the 1970s. The state fishery

historically was managed using size limits and seasons, which did not account for density-dependent reproduction and assumed regular successful recruitment. A combination of factors, most notably overfishing, reduced numbers of this bottom-dwelling species to very low levels, resulting in a fragmented population. Results from remotely operated vehicle (ROV) surveys and population viability analyses suggested that the remaining individuals were too far from potential mates to reproduce successfully in the wild. The fishery closure in 1997 has not reversed this status. In 2001, white abalone was the first marine invertebrate to be listed as endangered under the ESA, a protective step that managers hoped would help white abalone to recover.

Monitoring of wild white abalone has confirmed that populations continue to decline in some areas, and the wild population is at high risk of extinction. Even if limited natural recruitment of

white abalone is occurring, it is happening too slowly to give the species the foothold it needs to weather future threats and be viable over the long-term. The best way to safeguard white abalone against extinction is a captive breeding program aiming to produce young abalone that would be placed in kelp forests (outplanting) to increase abundance and reproductive success of white abalone in the wild. These animals reared in captivity can enhance wild populations to the point that densities are boosted enough to sustain healthy and prolific populations. As the captive breeding program proceeds, continued monitoring of white abalone and their habitat must occur in order to identify habitats best suited for future enhancement efforts and to track species' status over time.

Restoring white abalone to subtidal rocky reefs will help ensure a resilient kelp forest ecosystem (one of the most diverse marine ecosystems on earth), allow a culturally iconic species to persist, and hopefully revive a once-thriving commercial and recreational fishery.

### Recovery Progress

Since the launch of the Species in the Spotlight initiative, we have worked with many partners to make substantial progress on the five key actions in the five-year priority actions plan for the white abalone: (1) expand existing captive propagation programs, (2) implement a successful outplanting program, (3) monitor and enhance white abalone populations in the wild, (4) identify, characterize, and prioritize existing and potential white abalone kelp forest habitat, and (5) develop a comprehensive, multi-institution outreach plan. Because each of these key actions is intricately linked, we report on progress across all actions in the following narrative.

NMFS recovery strategy for white abalone includes a captive breeding program to enhance wild populations in strategic locations in Southern California and Mexico (the historic range of the species). NMFS West Coast Region oversees the program in close coordination with the University



**White abalone** (*Haliotis sorenseni*)

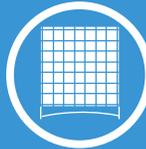
**Status:** Endangered

**Highlight:** Dependent on Captive Breeding Program

### Recovery Efforts



Expand existing captive propagation programs — **Increased captive production by several orders of magnitude: from thousands to millions over the last two years**



Implement a successful outplanting program — **Increased knowledge of where to outplant abalone in the wild and pilot outplanting program scheduled for late 2019**



Monitor and enhance white abalone populations in the wild — **NMFS, with partners, are developing methods to track abalone populations over time**



Identify, characterize, and prioritize existing and potential white abalone kelp forest habitat — **Identified key habitat features such as kelp resilience and algal composition**



Develop a comprehensive, multi-institution outreach plan — **Established a NMFS Communications Team White Abalone Outreach Campaign, which has helped highlight our program**



of California Davis Bodega Marine Laboratory and in partnership with a growing list of partners including: the University of California Santa Barbara, The Cultured Abalone, the Santa Barbara Natural History Museum Sea Center, the Cabrillo Marine Aquarium, The Bay Foundation, the Long Beach Aquarium of the Pacific, the NMFS SWFSC, the CDFW, and the Moss Landing Marine Laboratory. The partners are making great strides in understanding factors that are important for successful reproduction of adults and survival of young abalone. For example, laboratory studies are determining optimal light cycles and diet for adults; determining optimal settlement and rearing conditions for young juveniles; examining factors that reduce disease risk; and determining whether genetic background influences survival. As a result of these important studies, and a 2016 ESA permit to identify and collect eligible new broodstock from the wild, production has increased by several orders of magnitude: from thousands to millions over the last two years. New genes from recently collected wild

broodstock have boosted the genetic diversity of the captive population, which we hope will promote the overall health and resilience of captive-bred abalone upon their return to the wild during experimental outplanting efforts.

In addition to producing many healthy white abalone in captivity, a successful enhancement program depends on understanding the factors that influence the survival of outplanted animals in the wild. ROVs, divers using self-contained underwater breathing apparatuses (SCUBA), and closed-circuit rebreathers, time-lapse cameras (TLCs), and environmental data loggers are complimentary data gathering methods that help identify the best habitats for enhancement activities throughout the Southern California Bight, including Baja California, Mexico. NMFS oversees this program in close partnership with CDFW and several other partners including: the Aquarium of the Pacific; The Bay Foundation; Paua Marine Research Group; Subaqua Imaging/Pisces Design; Centro de Investigación Científica



Photo Credit: Mike Ready NWFS

y de Educación Superior de Ensenada; Baja California, and Comunidad y Biodiversidad. Partners are honing in on important habitat features to consider when selecting outplanting sites. These features include kelp resilience, algal composition, ocean temperature, sea floor substrate type and relief, the presence of remnant wild white abalone populations, and predator abundance. Several devices for delivering and acclimating captive abalone to their new homes in the wild (i.e., outplant modules) are being tested to see which confer a survival advantage. Experimental sites and promising module designs were selected for outplanting red and green abalone by NMFS, CDFW, Get Inspired, Paua Marine Research Group, and the Bay Foundation. In the meantime, an ESA permit that paves the way for white abalone outplanting will be issued in 2019.

In anticipation of the day when the outplanted white abalone grow and thrive, in some cases alongside the few remnant wild adults, NMFS and partners are developing methods to track the demographics of populations over time. TLCs can monitor the movements and behavior of outplanted abalone continuously over areas < 5m<sup>2</sup> in the days and weeks following release. SCUBA surveys can monitor larger areas (100s of m<sup>2</sup>), in water depths up to ~ 90 ft. that have dense kelp. SCUBA surveys are effective for observing small, cryptic abalone in the days, weeks, months, and years following outplanting and can generate estimates of density on a per meter-squared basis. ROV surveys can cover large areas (hectares) in deeper waters (> 80 ft.) that do not contain thick kelp beds. ROVs are most effective for observing adults on open surfaces and can generate population estimates for large areas on annual or longer cycles. Genetic tools can monitor the survival, connectivity, and diversity of wild and enhanced populations. Non-invasive pathogen-detection methods are being developed to assess the health of wild and enhanced populations. Combining these monitoring tools maximizes the temporal and

spatial coverage of rocky reefs, generates better population estimates, and helps determine whether enhancement efforts are building healthy, sustainable populations.

Our partner list continues to expand and now includes regular cooperation with several commercial aquaculture farms. Partnership with the U.S. Navy is ongoing. New partnerships with academic and government scientists in Baja California, Mexico, continue to develop. Within NOAA we are working together to carry out a variety of recovery activities. Our new relationships were forged and our current partnerships sustained by holding workshops, attending meetings, and developing interagency agreements. One such workshop developed the outline of a strategic plan for white abalone outplanting activities, schedules, cost estimations, and data sharing plans. This strategic plan will be final in time to inform our first experimental outplanting activities with white abalone. We continue to implement grant programs (e.g., ESA Section 6 Grants to States) and communicate a unified message for recovery. Outreach and education programs at our partner institutions and the Species in the Spotlight initiative, accompanied by the NMFS Communications Team White Abalone Outreach Campaign, have helped highlight our program to perspective partners and funding agencies.

### Summary

Our captive propagation program has expanded such that millions of healthy animals, suitable for future outplanting, are currently in captivity. The methods for captive spawning and rearing have improved, factors that lead to higher rates of spawning and survival are being identified, health care protocols are being employed and improved when necessary, and additional partners with unique skill sets are contributing to the program. New genetic diversity has been incorporated into the captive breeding program through the collection of wild broodstock for the first time in years. As we approach the



issuance of an ESA permit allowing the first experimental outplanting of captive-raised white abalone in 2019, methods to meet this goal are being perfected by outplanting closely related species of abalone into habitats that possess characteristics thought to promote long-term survival of white abalone. We have identified monitoring tools useful for tracking outplant success, genetics, and health status

of wild and restored white abalone populations. A NMFS strategic plan for outplanting is being developed to identify partner participation, activities, schedule, cost estimates, and methods for data sharing. This effort will form the basis for new partnerships, additional funding, and more effective and efficient implementation of recovery actions.

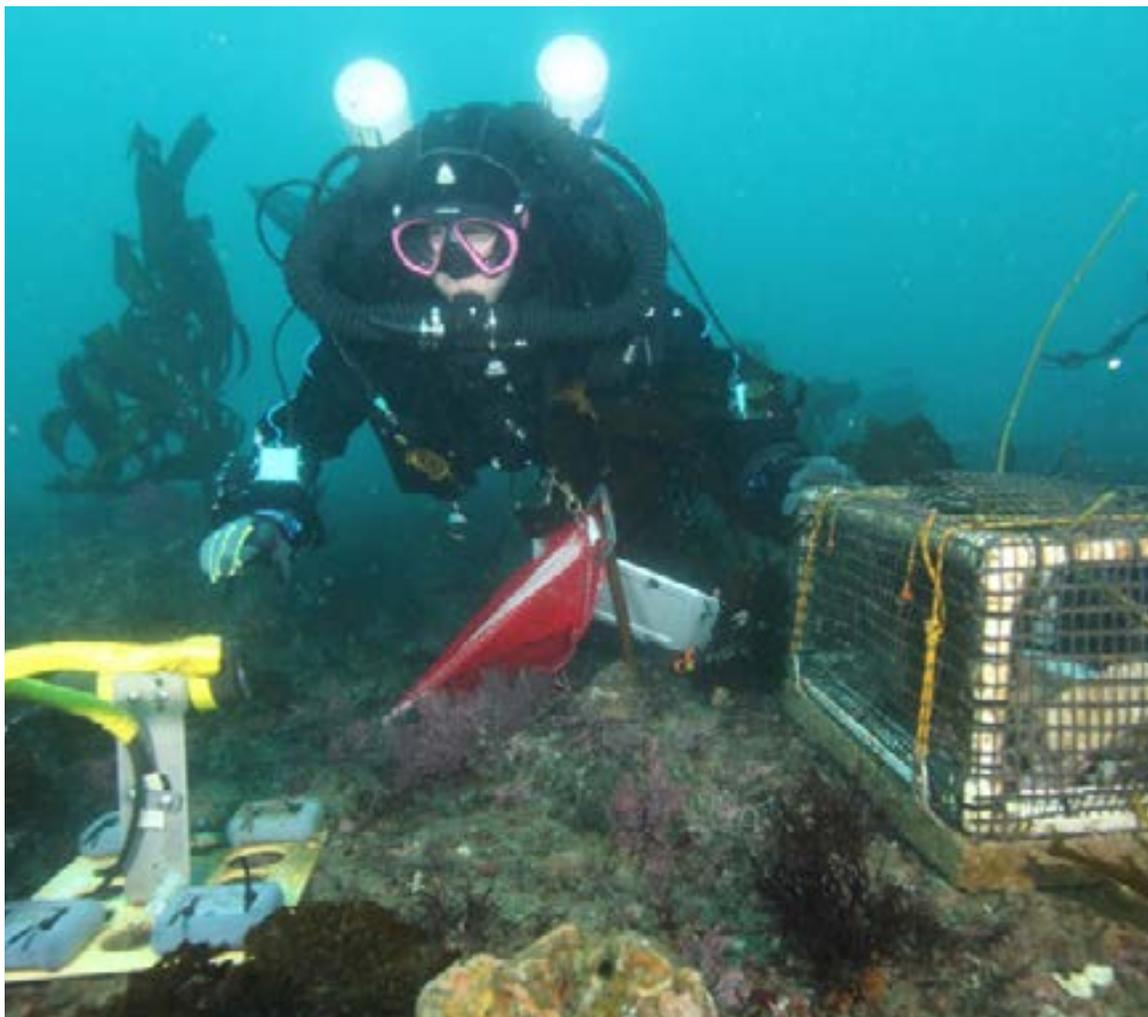


Photo Credit: David Witting, NOAA RC

## PARTNER in the SPOTLIGHT: Amanda Bird, Paua Marine Research Group

Amanda Bird (Paua Marine Research Group, PMRG) has played an instrumental role in advancing field-based methods to restore white abalone populations in the wild throughout the Southern California Bight. Amanda pursued a Master's program at California State University, Fullerton in the Fall of 2013, where she focused on assessing the population status of pinto abalone populations in southern California, which are closely related to white abalone. During her thesis research, Amanda worked closely with NMFS on white abalone recovery efforts. It was during that time that Amanda and a small group of dedicated underwater researchers identified a remnant wild population of white abalone in San Diego County, paving the way for future restoration work. In January 2016, Amanda founded PMRG—a marine and estuarine biological consulting firm—in San Diego, California. Amanda and PMRG provide expertise in biological sampling and habitat conservation to support the effective management of marine resources on the U.S. west coast. As a certified Small Women-owned Business Enterprise, Amanda has developed strong collaborations with federal and state governmental organizations, academic institutions, NGOs, and other consulting companies to provide comprehensive and effective marine resource management strategies to the larger white abalone conservation collaborative. Amanda has coupled excellent underwater skills with creative and innovative scientific technique to better understand the habitat needs of white abalone and develop a strategic approach to identifying and establishing restoration sites. Her kind and intellectual nature, alongside her commitment and passion, are responsible for forging and maintaining productive relationships that advance technological methods for monitoring white abalone (e.g., TLCs, SCUBA, and closed-circuit rebreathers) as well as data management and scientific interpretation of laboratory and field data. Amanda never hesitates to go beyond the call of duty to help out with all logistical aspects of making the white abalone program a success, from setting up rearing systems, to pouring concrete for outplant modules, to 12 hour plus workdays in the field. Because Amanda's skill set is so diverse, and because of her ability to think always about details, promote safety, and use creative approaches to solve problems, NMFS has selected Amanda as our Partner in the Spotlight.



Photo Credit: A. Obaza, PMRG



ATLANTIC SALMON GULF OF MAINE DPS



CENTRAL CALIFORNIA COAST COHO ESU



COOK INLET BELUGA WHALE DPS



HAWAIIAN MONK SEAL



NORTH ATLANTIC RIGHT WHALE



PACIFIC LEATHERBACK SEA TURTLES



SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON ESU



SOUTHERN RESIDENT KILLER WHALE



WHITE ABALONE





**U.S. Secretary of Commerce**  
Wilber Ross

**Assistant Secretary of Commerce for Oceans and  
Atmosphere and Acting Under Secretary of Commerce for  
Oceans and Atmosphere**

**Neil A. Jacobs, Ph.D.**  
Assistant Secretary of Commerce for Environmental  
Observation and Prediction Performing the Duties  
of Under Secretary of Commerce for Oceans and  
Atmosphere

**Assistant Administrator for NOAA Fisheries**  
Chris Oliver

**October 2019**

**[www.fisheries.noaa.gov](http://www.fisheries.noaa.gov)**

**OFFICIAL BUSINESS**

**National Marine Fisheries Service**  
1315 East-West Highway  
SSMC 3, F/OPR Room 13821  
Silver Spring, MD 20910

# Commercial Herring Eggs on Kelp (HEOK) Regulations:

## Post-FMP Cleanup

Fish and Game Commission Marine Resources  
Committee Meeting - Sacramento  
November 5, 2019



Andrew Weltz  
Environmental Scientist  
Aquaculture and Bay Management



# HEOK: FMP Regulations Cleanup

1. Reinstate permit quotas – §163(c)(4), 163(c)(6)(B), 163(e)(3)(C) (new), 164(h)(4)
2. Allow weekend landings – §164(h)(4)
3. Include 'rinsing' in definition of Processing – §164(a)(3)
4. Allow marine mammal deterrent devices – §164(g)
5. Factor breakdown into corkline marking requirements – §164(d)(1)(E) and (F)
6. Remove noise rule – §164(f)
7. Permittee on board; replace 'on board vessel' with 'immediately present during' – §163(e)(3)(B)



## IMPLEMENTING THE CALIFORNIA FISHERIES INNOVATION ACT OF 2018: EXPERIMENTAL FISHING PERMIT PROGRAM

### Stakeholder Workshop

Location/call in: TBD

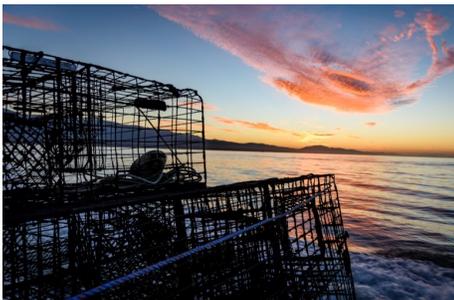
Date: January 14, 2020

#### WORKSHOP PURPOSE

The purpose of this workshop is to initiate a dialogue among the California Fish and Game Commission, California Department of Fish and Wildlife, and stakeholders regarding how best to design a state experimental fishing permit (EFP) program to meet the objectives of the Fisheries Innovation Act of 2018 and the needs of stakeholders.

#### WORKSHOP OBJECTIVES

- Collectively learn about potential EFP program models that could be adapted for use in California
- Educate stakeholders regarding the statutory requirements and key components identified in Fish and Game Code Section 1022, receive input on early thoughts about program design and expected time frame for regulatory development
- Gain input on anticipated EFP proposal areas, and issues and topics related to the new EFP program that are important to stakeholders



If you are interested in attending, please email [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov) and include "EFP Workshop" in the subject line. Please forward any additional questions about the EFP program to Marina Som ([Marina.Som@wildlife.ca.gov](mailto:Marina.Som@wildlife.ca.gov))



## COMMITTEE STAFF SUMMARY FOR JUL 11, 2019

## 5. MARINE LIFE MANAGEMENT ACT MASTER PLAN

## 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            | Jun 20-21, 2018; Sacramento            |
| • Update on master plan implementation    | Nov 14, 2018; MRC, San Clemente        |
| • Implementation update                   | Mar 20, 2019; MRC Sacramento           |
| • <b>Today's update on implementation</b> | <b>Jul 11, 2019; MRC, San Clemente</b> |

## 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* (Master Plan), developed by DFW with stakeholder input.

In Jun 2018, FGC adopted an updated plan, *2018 Master Plan for Fisheries: A Guide for Implementation of the Marine Life Management Act* ([2018 Master Plan](#)) and the topic was referred to the MRC with the request that it become a standing agenda item to discuss implementation steps, priorities, and opportunities associated with the 2018 Master Plan, and receive regular DFW updates.

In Jun 2018, FGC referred this as a topic to the MRC and requested it become a standing agenda item to discuss implementation steps, priorities, and opportunities associated with the 2018 Master Plan, and receive regular DFW updates.

Today is the fourth discussion of MLMA implementation efforts since its adoption. DFW staff will provide an update on implementation efforts and the final workplan that was provided in Jun to FGC (Exhibit 1) and has included enhanced status reports (ESRs) for Kellet's Whelk, Ridgeback Prawn and Hagfish (exhibits 2-4).

## Significant Public Comments (N/A)

## Recommendation (N/A)

## Exhibits

1. MLMLA Implementation Work Plan, dated Jun 3, 2019
2. Kellet's Whelk, *Kelletia kelletii*, Enhanced Status Report, dated Jun 2019
3. Ridgeback Prawn, *Sicyonia ingentis*, Enhanced Status Report, dated Jun 2019
4. Pacific Hagfish, *Eptatretus stoutii*, Enhanced Status Report, dated Jun 2019

**COMMITTEE STAFF SUMMARY FOR JUL 11, 2019**

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

## Chapter 2 – Prioritizing management efforts

Given the large number of fisheries under state jurisdiction and limited Department resources, prioritizing management efforts is essential. Section 7073(b) of the MLMA requires the Master Plan to include a priority list of fisheries for the preparation of FMPs. The highest priority is given to fisheries that have the greatest need for changes in management in order to comply with the objectives of the MLMA. The 2001 Master Plan included such a list, however, it proved difficult to focus work solely on priority fisheries. A variety of factors including new and competing mandates, unforeseen events, emergencies, and a changing regulatory landscape hampered the Department's ability to focus efforts exclusively on the priority species. Future prioritization efforts must be made in close coordination with the Commission, Tribes and tribal communities, and stakeholders to ensure there is a shared understanding of how priorities will be addressed and what resources will be required. It will also be important to establish a shared understanding of when it may be necessary, or desirable, to shift focus away from and/or reevaluate the existing list of priorities. Criteria for considering new priorities are provided below.

Potential approaches to prioritization vary in scope and intensity. The 2001 Master Plan used a method that focused on the **vulnerability** of specific stocks to fishing. However, the MLMA includes other objectives related to socioeconomics and the potential impacts of fisheries to habitat and bycatch species that should also be considered when identifying priorities. A prioritization approach that addresses the full range of MLMA objectives should be adopted by the Commission as part of the Master Plan before it is applied. As such, this Master Plan includes both an updated interim priority list to guide near-term Department efforts and to satisfy the requirements of Section §7073, and a framework to implement MLMA-based management to be conducted as the Master Plan is implemented.

To develop the initial priorities described below, the Department identified 36 **finfish** and invertebrate species that are the target of 45 distinct fisheries for initial prioritization. While these 36 species are only a small subset of the hundreds of species under state jurisdiction, the Department selected them for analysis because they represent the vast majority of commercial **landings** value, as well as commercial and recreational participation. These 45 fisheries include specific gear types targeting a single species. For example, the halibut trawl fishery is considered separately from the halibut **gill net** fishery. This is because different gear types are often deployed in different areas and with varying impacts. Note that to focus the initial analysis, not all gear types targeting the selected species were included. Once these initial fisheries have been addressed through the prioritization approach within the framework depicted in Figure 1, additional fisheries may be selected for analysis.

### *Interim priority list*

The 45 fisheries were evaluated using a PSA, which identifies the relative risk fishing may pose to each fishery (Patrick et al. 2009). Relative risk was assessed first by a consultant (MRAG Americas) and then reviewed and adjusted by Department subject matter experts, using relative scaling scores ranging from 1 to 3 for two sets of attributes. The first set of attributes measures the **productivity** of the species, which is derived from life-history characteristics such as age at maturity and trophic level. The second set of attributes measures the **susceptibility** of the species, which includes, for example, overlap of a species' distribution with fishing effort. This second set is designed to assess the species' response to fishing pressure. The PSA metrics are combined to calculate the relative vulnerability of each fishery to other state-managed fisheries using a prescribed formula. The PSA also includes an index that scores the quality of information and the level of confidence in each attribute. A PSA does not provide information on the current status of a stock and does not specify harvest guidelines or management actions. Instead, the main purpose of the PSA is to identify fisheries that are likely to be more vulnerable to a particular method of fishing. It also identifies fisheries with more data gaps than others through the inclusion of a data quality factor.

The full results of the PSA and additional details on the methodology are available at [http://www.oceansciencetrust.org/wp-content/uploads/2017/07/CDFW-PSA-Report-on-Select-CA-Fisheries\\_Final-.pdf](http://www.oceansciencetrust.org/wp-content/uploads/2017/07/CDFW-PSA-Report-on-Select-CA-Fisheries_Final-.pdf). These relative PSA scores were used to bin the 45 fisheries into low, medium, and high priority and generate an interim list of priority fisheries (see Appendix E) that will be used to help guide Department efforts while the comprehensive prioritization approach described below is implemented.

### ***Comprehensive prioritization approach***

Prioritizing fisheries based on a fuller suite of MLMA objectives will require looking beyond an assessment of just risks to target stocks. To advance the objectives identified in the MLMA, the prioritization approach should:

- Provide a clear and systematic means of utilizing best available science and other relevant information to guide use of limited Department resources in managing the state's fisheries consistent with the MLMA.
- Identify target populations and/or ecosystem features at relatively greater risk from fishing.
- Identify where current management is inconsistent with the policies and requirements of the MLMA, and how those inconsistencies overlap with the ecological risks that have been identified.
- Advance socioeconomic and community objectives in a manner consistent with the MLMA's definition of sustainability.
- Be robust and clear enough for stakeholders to understand and for the Department to implement.
- Provide a strategic means of addressing emerging fisheries without unduly displacing existing priorities.
- Allow for re-evaluation when deemed necessary, or at least every five years.

In addition to the sustainability of the target stock, the MLMA is concerned with impacts to habitat and bycatch species. Section 7084 and 7085 are aimed at minimizing the impacts to habitat and bycatch, respectively. New tools have been developed in the years since the original Master Plan was adopted that can help to address these objectives.

### ***Ecological Risk Assessment***

A diversity of **Ecological Risk Assessment (ERA)** frameworks have been developed and used to prioritize management efforts across the globe. These frameworks consider a broader range of risks than a PSA. Specifically, they can examine the following:

- The impact from fishing activity to **target species** (similar to a PSA).
- The risk from fishing activity to bycatch species.
- The risk from fishing activity to habitats which it encounters.
- Aspects such as the potential benefits to the resource and the fishery from California's network of MPAs.

ERAs are similar to PSAs in concept but may use a broader range of attributes. The **California Ocean Science Trust (OST)** conducted a review of available ERA frameworks worldwide and considered certain approaches appropriate for California. Drawing from this experience, the Department will integrate the PSA and ERA tools into the prioritization approach in a way that capitalizes on their respective strengths. Specifically, the Department will use the PSA scores with the addition of four

attributes from the target species component of the ERA (estimated fishing **mortality** rate, population connectivity, temporal intensity of fishing, and potential benefits from MPAs) to assess potential risk to target fisheries. For habitat and bycatch, the Department will use the ERA as developed and piloted by OST, and as modified by Department and stakeholder input. The pilot ERA process scored 9 of the 45 fisheries that were previously analyzed using PSA. Once the four additional target attributes and bycatch and habitat ERAs are completed for the remaining 36 fisheries, scores will be presented as three groups (low, medium, and high relative risk). Additional details and considerations associated with the ERA can be found at <http://www.oceansciencetrust.org/projects/era/>.

Application of this approach should provide the opportunity for stakeholder input and the results should be used to categorize fisheries into low, medium, and high risk from a biological and ecological perspective. Low-risk fisheries will not require further evaluation or new conservation measures, and current management can simply be characterized through an ESR as described in Chapter 3. Medium and high-risk fisheries will be further prioritized based on socioeconomic opportunity as described below (see also Figure 1). If an FMP-managed species is identified as high risk, an FMP amendment may be necessary to address those risks.

#### *Climate change*

In California and elsewhere, efforts are underway to develop and evaluate tools that assess species' vulnerability and that incorporate risk from climate change into ERAs. Results from such assessments will provide valuable information for categorizing fisheries' level of risk. Until such results are available, the Department will consider augmenting the ERA results with information garnered through other efforts (e.g., federal climate vulnerability assessments of similar species).

#### *Socioeconomics*

Among the fisheries that are identified as high priority from an ecological and biological perspective, management efforts should first be directed towards those where ensuring sustainability has the highest economic value to the state. These will generally be fisheries with high commercial value and participation, and/or high recreational participation. However, an approach based on just value and participation could result in missed opportunities for the Department to achieve socioeconomic goals. Therefore, the Department will consider augmenting value and participation data with its own understanding of the socioeconomic goals of the fisheries. Additionally, consideration of community vulnerability indices and other human dimensions indicators such as those generated by the **National Oceanic and Atmospheric Administration (NOAA)** on the West Coast, can help identify vulnerable ports and regions and provide additional insight into where management action may have the most benefit (see: <https://swfsc.noaa.gov/publications/CR/2014/2014Breslow.pdf>).

#### ***Priority list***

Provided that adequate resources and/or funding are available, the Department will apply the comprehensive prioritization approach described, generate a priority list of fisheries, and provide it to the Commission within one year of Mast Plan adoption. The priority list should be evaluated no less than every five years, and if necessary, the prioritization approach should be re-applied.

The information gathered through the PSA, ERA, and socioeconomic analyses described above can also help to inform management action for specific fisheries. Regardless of the form that management action takes, these analyses can help to provide background information, identify data gaps, and highlight aspects of a fishery that may need management attention. Therefore, as these analyses are conducted, information will be generated, structured, and retained with the additional goal of informing management action in mind.

### ***Consideration of emerging and emergency issues when implementing priorities***

The priorities that are established through the process described above will help guide implementation efforts. However, changes in fisheries may occur that require special attention and a departure from these priorities. For the priority list of fisheries to be meaningful, new or emerging issues should be considered in light of existing priorities, staffing, and other resources. Emergency issues (as defined by Government Code §11346.1(b) and Fish and Game Code §5523, §5654, and §7710) requiring immediate attention will inevitably arise. However, the Department and Commission should evaluate more discretionary efforts based on the following:

- Does the proposed new priority require immediate action in order to address sustainability or conservation concerns? If so, how?
- Does the proposed new priority require immediate action in order to address serious economic hardship to fishery **participants**? If so, how?
- Do current conditions create a unique or one-time opportunity to address the proposed new priority? If so, how?
- Does the fishery that is the subject of the proposed new priority appear on the current prioritization list? If so, where does it rank?
- Do available data allow for effective decision-making on the proposed new priority?
- How does the proposed new priority advance the goals of the MLMA?
- Are partnership opportunities available to help address the issue and reduce Department resource requirements?
- What is required to accomplish the proposed new priority (FMP, rule promulgation, research, etc.), and what are the requirements for staff, time, and other resources?
- What existing priorities on the Department's workplan would have to be eliminated or postponed in order to address the new priority?

Whether it is the Department, Commission, Tribes and tribal communities, or stakeholders that are proposing the new priority, the proposal or directive to address the new priority should be accompanied by responses to these inquiries. This will help to ensure that any deviations from the existing priority list are deliberate, strategic, and serve to advance the goals of the MLMA.



# Implementing the MLMA Master Plan

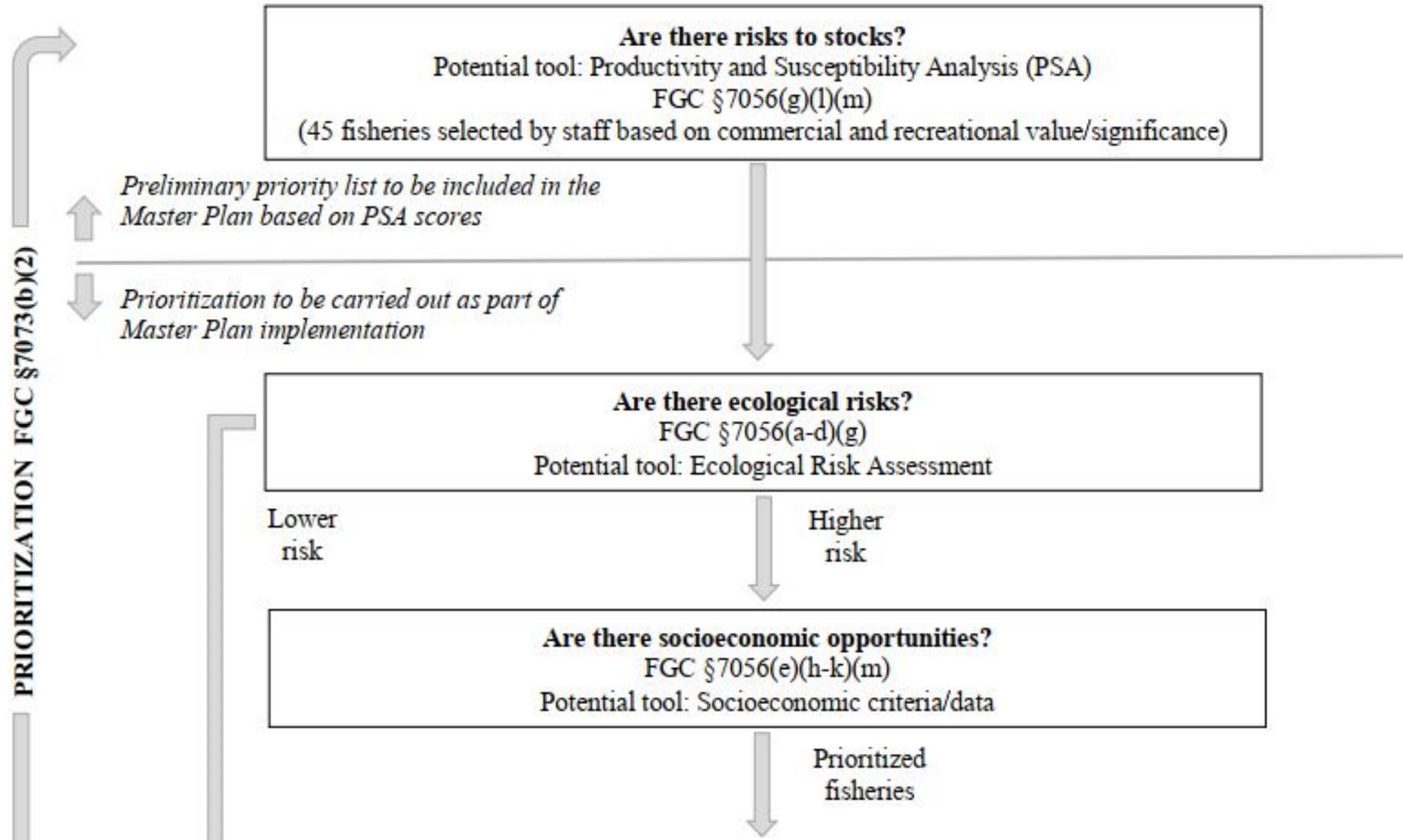
## Prioritizing Key California Fisheries

Deborah Aseltine-Neilson, California Department  
of Fish and Wildlife

**Marine Resources Committee Meeting**

Sacramento, CA • November 5, 2019

# Framework for MLMA-based Management



# Conducting a Productivity-Susceptibility Analysis (PSA)

---

- Collaboration with CDFW and partners to select and apply a PSA to state-managed fisheries with greatest catch or landings (2015-2016)
- 45 state-managed fisheries
  - 21 finfish and 17 invertebrate species
- Interim priority list in 2018 Master Plan based on PSA results only, as ERA development was not complete

# Customizing an Ecological Risk Assessment (ERA)

---

- Iterative tool development, involving partners and stakeholders
  - Draft tool shared and refined during stakeholder workshops as part of Master Plan amendment process
  - Tool further refined by CDFW to be more streamlined, intuitive, and timely
- ERA framework
  - Target = impact from fishing activity to target species (impacts not captured in the PSA)
  - Bycatch = risk from fishing activity to bycatch species
  - Habitat = risk from fishing activity to habitats where fishing occurs

# Conducting ERAs

---

- Today, ERAs completed for 32 fisheries
  - 21 finfish and 3 invertebrate species
  - ERA for White Sturgeon was completed, but not included in the prioritization process
- Goal is to complete ERAs for all fisheries
  - The remainder of the key invertebrate fisheries will be assessed when resources become available

# ERAs: Definitions

---

- Fishery = species/sector/gear type
- Bycatch = any fish or invertebrate which is captured and returned to the water
- Guild = group of species with similar characteristics
- Bycatch guilds:

## Sensitive

Marine mammals

Marine birds

T/E\* and special status species

## Non-sensitive (examples)

Elasmobranchs

Pelagic fish

Marine invertebrates

\*T/E = Threatened or Endangered

# ERAs: Definitions, continued

---

- Habitat types
  - Habitat-forming Marine Vegetation
  - Habitat-forming Marine Invertebrates
  - Nearshore Hard Bottom (0-200m)
  - Nearshore Soft Bottom (0-200m)
  - Offshore Hard Bottom (> 200m)
  - Offshore Soft Bottom (> 200m)
  - Pelagic
  - Estuaries
  - Hard-bottom Intertidal
  - Soft-bottom Intertidal

# PSA + Target

---

- Four Target attributes were added to those of the PSA to provide a more comprehensive risk assessment for target species
- For the resulting PSA scores, natural breaks in the scores were identified and ranks assigned based upon these natural breaks
  - Highest rank (highest priority) = 1
  - Lowest rank (lowest priority) = 4

# Bycatch

---

- Initial results
  - Similar fisheries often did not have similar scores
  - Some hook-and-line fisheries had higher scores than some gill net fisheries
- Review of bycatch scoring
  - Wide variation in number of guilds scored
  - Possible that input (e.g., number of guilds scored) for some fisheries was biased due to scarcity of bycatch information

# Bycatch

---

- Streamlining the bycatch approach
  - Recognize that certain gears have potential to interact with more sensitive and non-sensitive bycatch guilds
    - Potential breath of sensitive and non-sensitive bycatch guilds identified for each gear type
  - Release mortality and magnitude of bycatch are highest weighted attributes in original ERA tool
    - Used only the release mortality and magnitude of bycatch for ranking gears
- All hook-and-line gears received same rank

# Bycatch Ranking

---

<b>Rank</b>	<b>Gear Type</b>
1	Gill net - larger mesh
2	Trawl - CA Halibut
2	Gill net - smaller mesh
3	Purse seine - Market Squid
3	Beam trawl
3	Trap - CA Spiny Lobster
3	Gill net - Pacific Herring
4	Trap - CA Sheephead
4	Hook-and-line
4	Hoop Net - CA Spiny Lobster
4	Purse seine - Pacific Bonito
4	Trap - Pacific Hagfish, Shiner Perch
4	A-frame - Jacksmelt

# Habitat

---

- Initial results
  - Some offshore pelagic fisheries had higher scores than some nearshore hook-and-line fisheries
  - Some hook-and-line fisheries over soft bottom had higher scores than some hook-and-line fisheries over hard bottom/marine vegetation

# Habitat

---

- Review of habitat scoring
  - Several factors contributed to the incongruous results, including:
    - The selection of habitats and the percentages assigned to each habitat
    - The scoring of the attributes, some of which were subjective rather than objective, resulting in different interpretations by the fishery experts
- Streamlining the habitat approach
  - Ranked each combination of gear-habitat(s) based upon knowledge of the effects of different gears on specific habitats

# Habitat Ranking

---

Rank	Gear type	Habitat
1	Trawl	Nearshore soft
2	Gill Net	Nearshore soft
2	Trap	Nearshore hard, vegetation, inverts
2	Trap	Nearshore hard, vegetation
2	Hoop Net	Nearshore hard, vegetation, inverts
3	Trap	Nearshore soft, offshore soft
3	Hook-and-Line	Nearshore hard, vegetation, inverts
3	Hook-and-Line	Nearshore hard, vegetation
3	Hook-and-Line	Nearshore hard, nearshore soft, vegetation
4	Hook-and-Line	Nearshore soft, vegetation
4	Hook-and-Line	Nearshore soft
4	Purse Seine	Pelagic, Nearshore soft
5	Gill Net	Pelagic
5	Hook-and-Line	Pelagic
5	Purse Seine	Offshore pelagic
5	A Frame	Nearshore soft

# Combining Ranks

---

- A PSA, Bycatch ERA, and Habitat ERA were conducted for each fishery
  - Ranks are relative and not comparable among risk assessments
- Ranks from the three risk assessments were added to attain a total number for each fishery
  - Lower total number = higher risk
  - Higher total number = lower risk
- Total numbers were not binned as these results represent a continuum
- The updated priority list should not be viewed as final.
  - Other high priority issues or concerns may take precedence.

# Results: Commercial Fisheries

<b>Species</b>	<b>Gear</b>	<b>Total</b>	<b>PSA Rank</b>	<b>Bycatch Rank</b>	<b>Habitat Rank</b>
Pacific Angel Shark	GN	4	1	1	2
CA Halibut	Trawl	5	2	2	1
CA Halibut	GN	5	2	1	2
White Seabass	GN	6	3	1	2
CA Bay Shrimp	Trawl	7	3	3	1
Spiny Lobster	Trap	7	2	3	2
Pacific Herring	GN	8	3	3	2
CA Sheephead	Trap	8	2	4	2
CA Barracuda	GN	10	3	2	5
Pacific Hagfish	Trap	11	4	4	3
Shiner Perch	Trap	11	4	4	3
Market Squid	PS	11	4	3	4
CA Halibut	HL	12	3	4	5
Pacific Bonito	PS	13	4	4	5
Redtail Surfperch	HL	13	4	4	5
Night Smelt	A frame	13	4	4	5
Jacksmelt	HL	13	4	4	5

# Results: Recreational Fisheries

---

<b>Species</b>	<b>Gear</b>	<b>Total</b>	<b>PSA Rank</b>	<b>Bycatch Rank</b>	<b>Habitat Rank</b>
Brown Smoothhound	HL	9	1	4	4
CA Sheephead	HL	9	2	4	3
Kelp Bass	HL	9	2	4	3
Ocean Whitefish	HL	9	2	4	3
Spiny Lobster	Hoop net	9	3	4	2
Spotted Sand Bass	HL	10	2	4	4
Barred Sand Bass	HL	10	2	4	4
CA Halibut	HL	11	3	4	4
Barred Surfperch	HL	11	3	4	4
White Seabass	HL	12	4	4	4
CA Barracuda	HL	12	3	4	5
CA Corbina	HL	12	4	4	4
White Croaker	HL	12	4	4	4
Pacific Bonito	HL	13	4	4	5

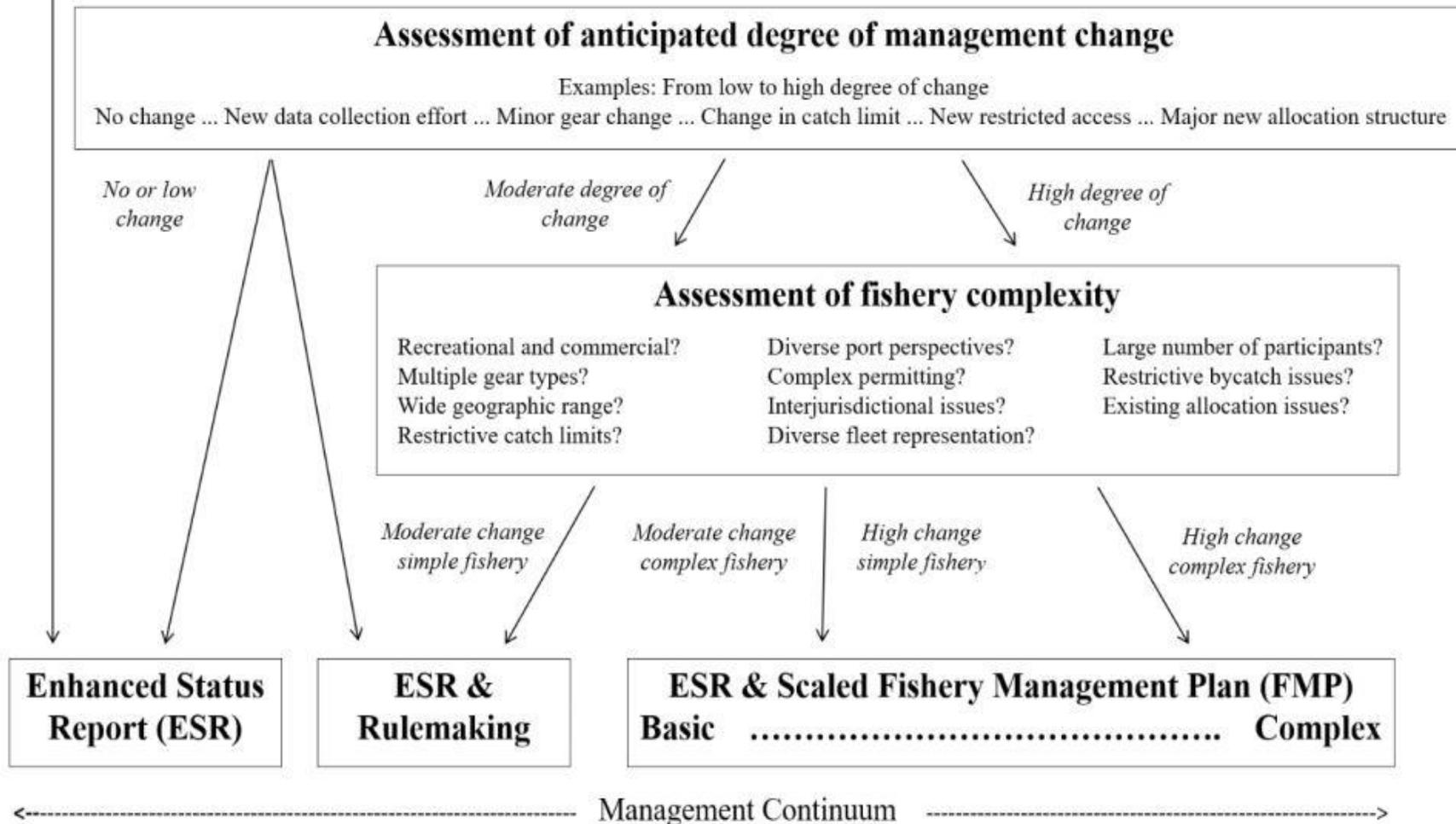
# Scaled Management

---

- Scaled management addresses the questions:
  - What happens next for fisheries that have been identified as higher priority?
  - What is the appropriate management action?
- Scaled management seeks to match the level of management effort with the management needs and complexity of the fishery

**Lower priority fisheries**

**Higher priority fisheries**



2018 Master Plan

**Figure 3. Identifying where a fishery falls along the management continuum.**

**COMMITTEE STAFF SUMMARY FOR JULY 11, 2019****6. KELP AND ALGAE COMMERCIAL HARVEST REGULATIONS****Today's Item**Information Direction 

Receive update from DFW on progress made for potential revisions to commercial kelp and algae harvest regulations.

**Summary of Previous/Future Actions**

- FGC approves 3-phase approach for kelp review Jun 2012
- FGC adopts Phase 1 kelp regulations Nov 2013
- MRC reviews approach to next regulation phases Nov 4, 2015; MRC, Ventura
- FGC approves revised 3-phase approach Dec 9, 2015; San Diego
- MRC update on regulation review (new Phase 2) Nov 15, 2016; MRC, Los Alamitos
- Update on regulation review Mar 6, 2018; MRC, Santa Rosa
- **Today's update on regulation review Jul 11, 2019; MRC, San Clemente**

**Background**

Kelp, an important biogenic habitat, is managed through DFW's kelp management program. In Jun 2012, FGC and DFW agreed to a three-phase approach to revise antiquated commercial kelp regulations over several years, to improve management and enforceability (Exhibit 1). The approved approach was to commence with Phase 1, to modernize boundaries for administrative kelp plans, improve reporting requirements, and require kelp harvest plans; would be followed by a review of fees in Phase 2; and would conclude with a review of commercial kelp and algae harvest management and regulations in Phase 3.

Phase 1 was completed in 2013 and implemented in 2014. Following a DFW update and discussion with MRC in Nov 2015, FGC approved an MRC recommendation to reverse the order of the 2<sup>nd</sup> and 3<sup>rd</sup> phases, to evaluate commercial kelp and algae harvest regulations as Phase 2 before reviewing fees as Phase 3. The reversal was intended to ensure any potential increased costs to DFW resulting from changes in kelp management structure could be considered in setting fees. The revised order is:

Phase 1: Boundaries and improved guidelines (2013–2014)

Phase 2: Review regulations for commercial kelp and algae harvest (2016–current)

Phase 3: Fees (TBD)

As part of Phase 2, DFW has focused on both regulatory clean-up and broader management and regulation overhaul, recognizing that California Environmental Quality Act compliance could be a constraining factor for the timeline and cost.

Today, DFW staff will present an update on the review of commercial harvest and marine algae regulations since the last update in Mar 2018, a timeline moving forward, and next steps.

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

**COMMITTEE STAFF SUMMARY FOR JULY 11, 2019**

**Recommendation (N/A)**

**Exhibits**

1. DFW memo on three-phase approach, dated Jun 1, 2012 (for reference purposes)
2. DFW presentation

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



# Commercial Kelp and Marine Algae Harvest Regulations

Marine Resources Committee  
Sacramento  
November 5, 2019

Dr. Craig Shuman  
Marine Regional Manager  
California Department of Fish and Wildlife



# Proposed Regulatory Amendments

## 1. Bull kelp

- Propose statewide closure

## 2. Marine algae

- Remove human food restriction
- Establish annual harvest limits
- Establish harvest methods

## 3. Prohibit take in San Francisco Bay, Tomales Bay, Humboldt Bay and Crescent City Harbor



# Proposed Regulatory Amendments (cont.)

## **5. Sea Palm**

- Establish harvest season, April-May
- Establish harvest methods

## **6. Modify Commercial Kelp Harvesting License**

- Consistency and efficiency

## **7. Modify Harvester's Monthly Reports**

- Include specific harvest location
- Streamline report design



# Next Steps

**November 2019:** Harvester Survey

**Winter 2019/2020:** Outreach and Scoping

**January, March 2020:** Draft proposal – TRC and MRC

**April 2020:** Notice - FGC

**June 2020:** Discussion - FGC

**August 2020:** Adoption - FGC

## 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    |
| • <b>Today receive peer review results for draft FMP</b>          | <b>Oct 17, 2018; Fresno</b> |

## Background

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

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

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

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

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

**STAFF SUMMARY FOR OCTOBER 17, 2018**

**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)**

## COMMITTEE STAFF SUMMARY FOR JULY 11, 2019

## 4. 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 discussions of FMP scope and content                          | Dec 2017-2018; 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         |
| • DFW update to MRC on FMP process                                  | Mar 20, 2019; MRC, Sacramento         |
| • <b>Today's update</b>   | <b>Jul 11, 2019; MRC San Clemente</b> |

## 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 for the FMP—one proposed by DFW, and an alternate proposed by The Nature Conservancy (TNC) using stakeholder-developed metrics—underwent peer review. FGC supported a peer review recommendation to explore integrating aspects of both draft management strategies to be more robust against uncertainty under different fishery conditions and referred the exploration to MRC. For a more detailed background on the process, 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. MRC recommended that FGC: (1) support integrating aspects of both draft management strategies based on a simulation modeling approach co-developed by DFW and the TNC-led stakeholder team, including engagement with abalone divers and other stakeholders; (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 at its Dec 2019 meeting.

In Mar 2019, DFW introduced MRC to a collaborative structure designed to support management strategy integration and public involvement as requested by FGC. The structure includes three collaborative teams: an administrative team, a modeling team, and a project team (see Exhibit 3 for details). The first project team public meeting was held May 22, 2019 in Santa Rosa (Exhibit 4). A second meeting via webinar is scheduled for Jul 19, 2019.

**COMMITTEE STAFF SUMMARY FOR JULY 11, 2019**

Today, MRC will receive a presentation from DFW and TNC staff on FMP progress made in the collaborative team structure (Exhibit 5).

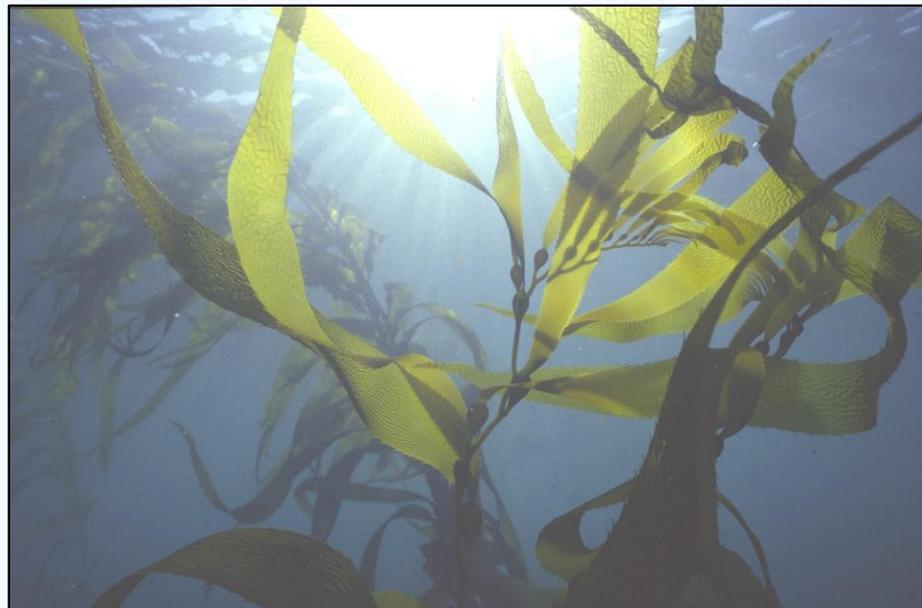
**Significant Public Comments (N/A)****Recommendation (N/A)****Exhibits**

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. DFW presentation provided at Mar 20 MRC meeting (for background purposes only)
4. Meeting materials for May 22, 2019 project team meeting, available at [www.opc.ca.gov/2019/05/red-abalone-management-strategies-integration](http://www.opc.ca.gov/2019/05/red-abalone-management-strategies-integration)
5. DFW presentation

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



# Statewide Kelp Restoration and Recovery Efforts



Marine Resources Committee Meeting  
November 5, 2019

James Ray and Dr. Laura Rogers-Bennett  
California Department of Fish and Wildlife



# Outline

- Background
- Statewide Kelp Restoration Toolkit
- Timeline and Next Steps



*Photos: A. Weltz  
CDFW*

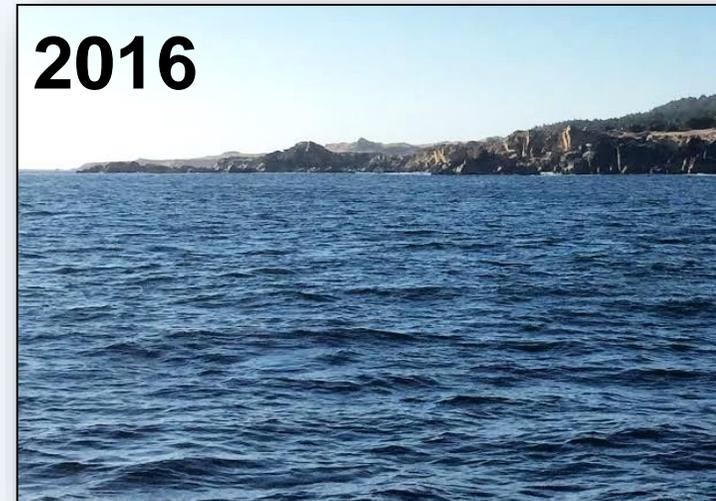
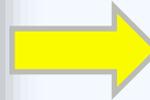


# Kelp Ecosystem Decline

Kelp forest ecosystems are ecologically and economically important.

Statewide kelp forests are increasingly threatened by multiple stressors.

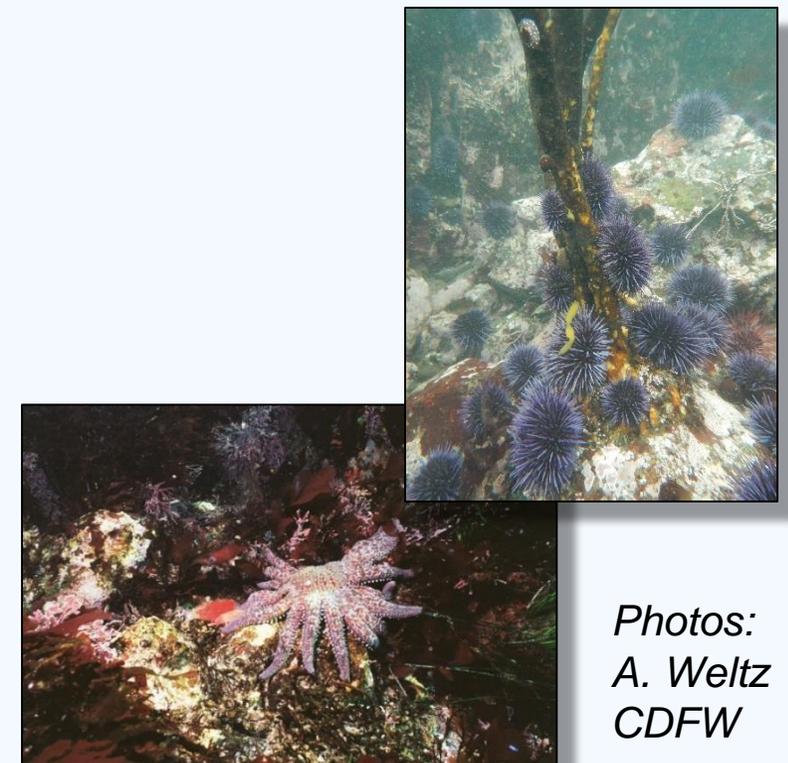
>90% loss of Bull Kelp forest canopy on the North Coast.





# What work has been done?

- 20 years ecosystem monitoring & 2017 pilot urchin control
  - CDFW
- Bull-kelp recovery plan – 2019
  - KELPRR (Kelp Ecosystem and Landscape Partnership for Research on Resilience) partnership
- Rulemakings to increase recreational purple urchin bag limit – 2018/19
  - Fish and Game Commission
- Urchin control efforts – 2013-2022
  - The Bay Foundation
  - Noyo Marine Science Center
  - Reef Check
  - Ocean Protection Council (OPC)
  - The Waterman's Alliance
  - Commercial urchin industry
- Kelp mapping – 2019/20
  - CDFW/OPC/The Nature Conservancy (TNC)
- Kelp risk assessment – 2019/20
  - TNC and CDFW



Photos:  
A. Weltz  
CDFW



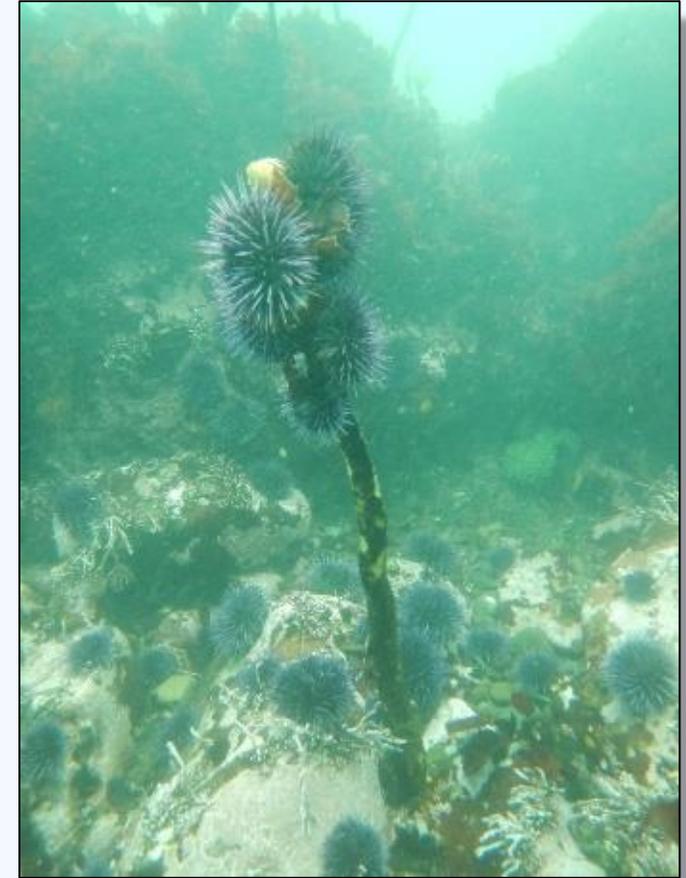
# Statewide Kelp Restoration Toolkit

- Evaluate creating bull kelp refuges through purple urchin control
  - Commercial and recreational divers, OPC, Reef Check
  - Evaluate urchin removal methods and monitor response of ecosystem
- Bull kelp spore dispersal and seed banking
  - Academic researchers
  - Kelp connectivity/spore density and genetic diversity
- Evaluate restoration actions at key giant kelp locations
  - e.g., Monterey, San Miguel Island
- Coast wide-mapping
  - OPC, TNC, and academic researchers
  - Evaluate satellite and aerial imagery
- Ocean climate modeling and kelp response
  - Bodega Marine Lab, Farallones Institute



# Outstanding Questions

- Over what scales can urchins be effectively controlled and is it sustainable?
- Is this enough to promote giant and bull kelp recovery?
- What other conditions are necessary for recovery?
- Costs and benefits of different urchin control methods?
- Other?



*Photo: Andrew Weltz CDFW*



# Policy Considerations

1. What is the appropriate mechanism to evaluate urchin smashing as a control method?
2. How do marine protected areas fit into developing a science-based kelp restoration strategy?
3. Resource allocation – cost/benefit analysis
4. Coordination of management entities



*Photo: Derek Stein CDFW*



# Timeline and Next Steps

- **November 2019:** Form kelp working group – begin to develop priority projects
- **December 2019 - February 2020:** Identify potential funding sources
- **February - April 2020:** Finalize initial suite of projects and pursue funding – continue development of statewide projects
- **Spring-Summer 2020:** Begin to implement funded projects
- **End 2020:** Finalize Statewide Toolkit
- **2021 & beyond:** Use toolkit to inform development of long-term Kelp Management Plan



*Photo: Derek Stein CDFW*



# Thank You Questions?

James Ray  
Environmental Scientist  
Marine Region  
707-441-5755



*Photo: Derek Stein CDFW*

---

**From:** Jan Freiwald [REDACTED] >  
**Sent:** Wednesday, October 23, 2019 4:14 PM  
**To:** FGC  
**Cc:** Keith Rootsart; Dan Abbott; tristin McHugh  
**Subject:** MRC meeting Nov 5, 2019 in Sacramento  
**Attachments:** Reef Check Urchin removal experiment MRC Nov 5 2019 r340.pptx

Dear MRC,

We would like to submit the attached presentation on behalf of Reef Check to inform the commissioners about the progress on our experimental purple urchin removal experiment in Monterey. This information is relevant to agenda item 8. Please let us know if you have any questions or would like any further information prior to the meeting.

Looking forward to presenting this to the MRC.

Thank you for your consideration.

Jan

--

Jan Freiwald, PhD  
Executive Director  
Reef Check Foundation

UC Santa Cruz  
Long Marine Laboratory  
115 McAllister Way  
Santa Cruz, CA 95060

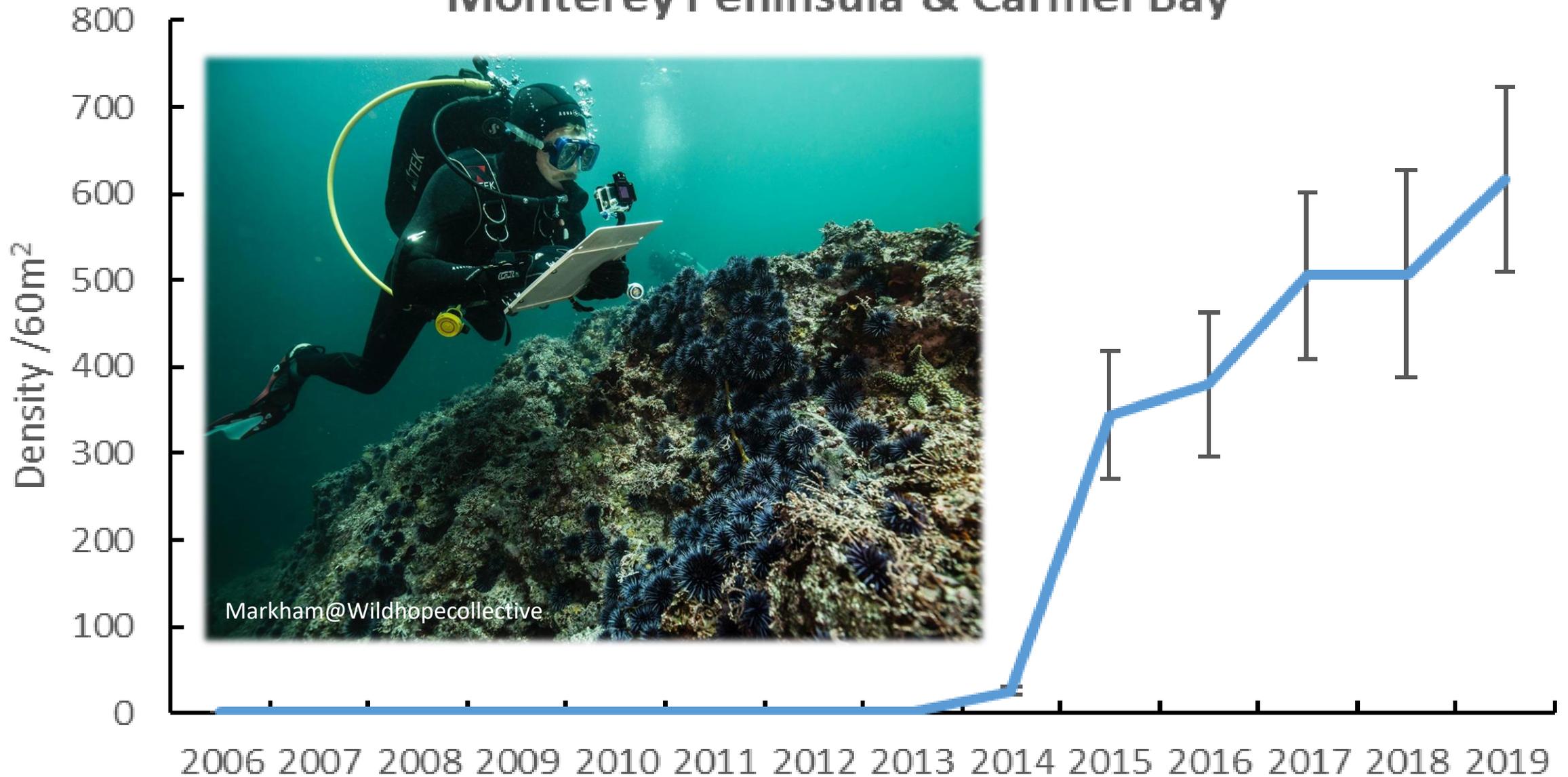
[REDACTED]  
[www.reefcheck.org](http://www.reefcheck.org)

An artistic illustration of a kelp forest. The background is a light, sandy beige color. Numerous purple sea urchins with spiky, star-shaped heads are scattered across the scene. Several tall, thin, brown kelp stalks with bulbous, air-filled bladders at the top rise from the seabed. The overall style is soft and painterly.

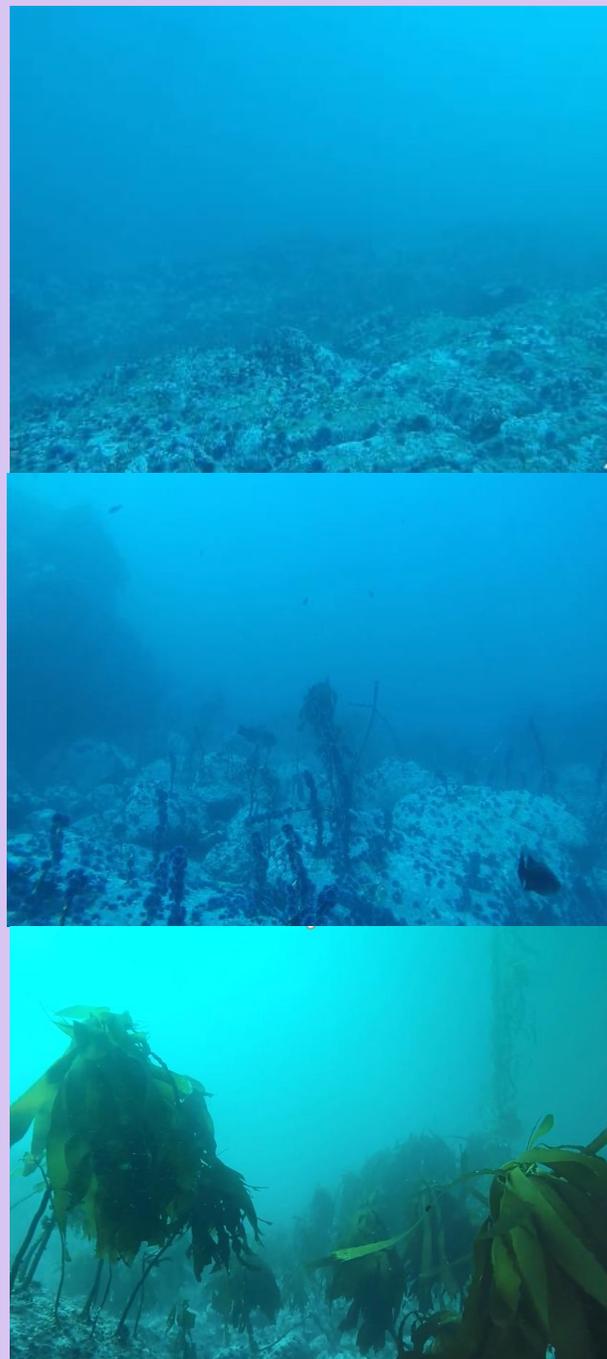
Giant Kelp Restoration  
Central Coast Urchin Removal Experiment  
First Year

Fish and Game Commission  
MARINE RESOURCES COMMITTEE  
NOVEMBER 5, 2019 SACRAMENTO

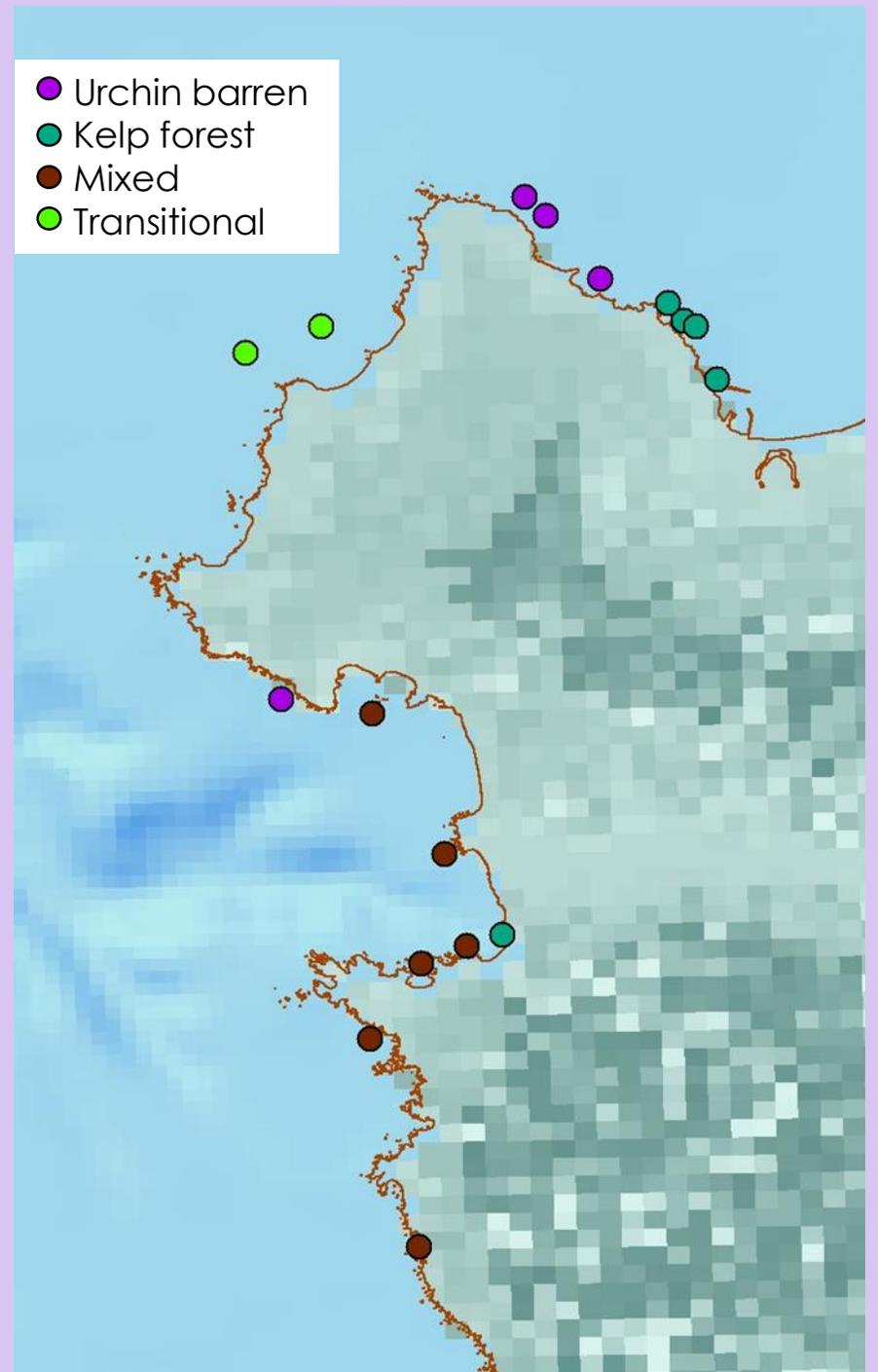
# Average Purple Urchin Density at Reef Check Sites Monterey Peninsula & Carmel Bay

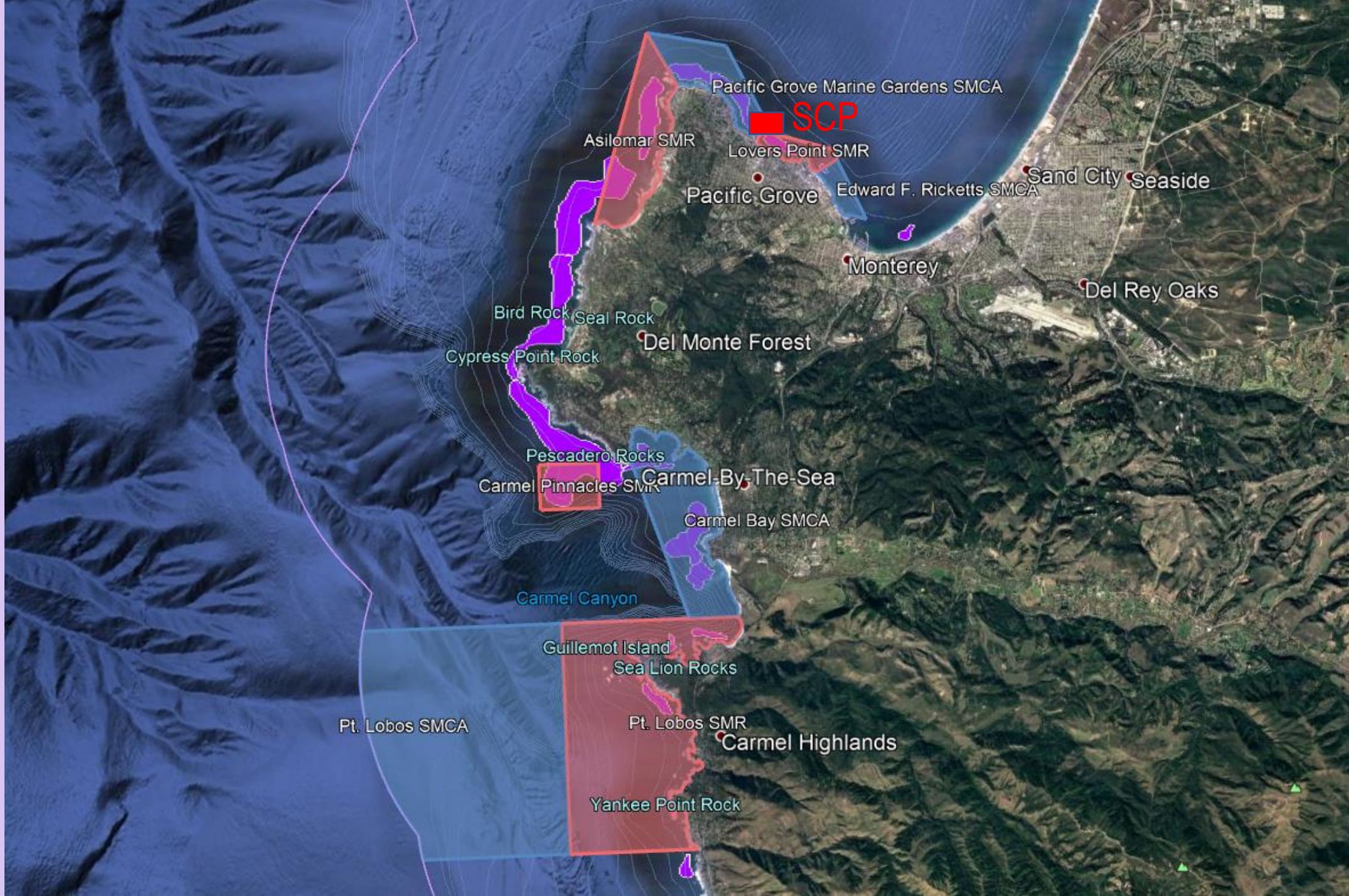


# Kelp and Urchin dynamics around Monterey Peninsula



- Urchin barren
- Kelp forest
- Mixed
- Transitional





Pacific Grove Gardens  
Marine Conservation  
Area.

20 reefs surrounded by  
sand.

Sizes from  $13\text{m}^2$  to  $68\text{m}^2$ .

Purple urchin densities  
from  $.075\text{m}^2$  to  $21\text{m}^2$ .

Manipulations started  
June 2019.

7 passes so far to  
maintain densities.

Reef Check survey of  
adjacent site 3 times.



Replicate 7

Size: 19m<sup>2</sup>

Design density: 0.15 urchins/ m<sup>2</sup>

Prescription: 3 purple urchins to remain.



Photo by Nicholas Ta, May 18, 2019

Replicate 18

MACROCYSTIS – GIANT KELP →

Size: 27m<sup>2</sup>

Design density: 0.075 urchins/ m<sup>2</sup>

Prescription: 2 purple urchins to remain.

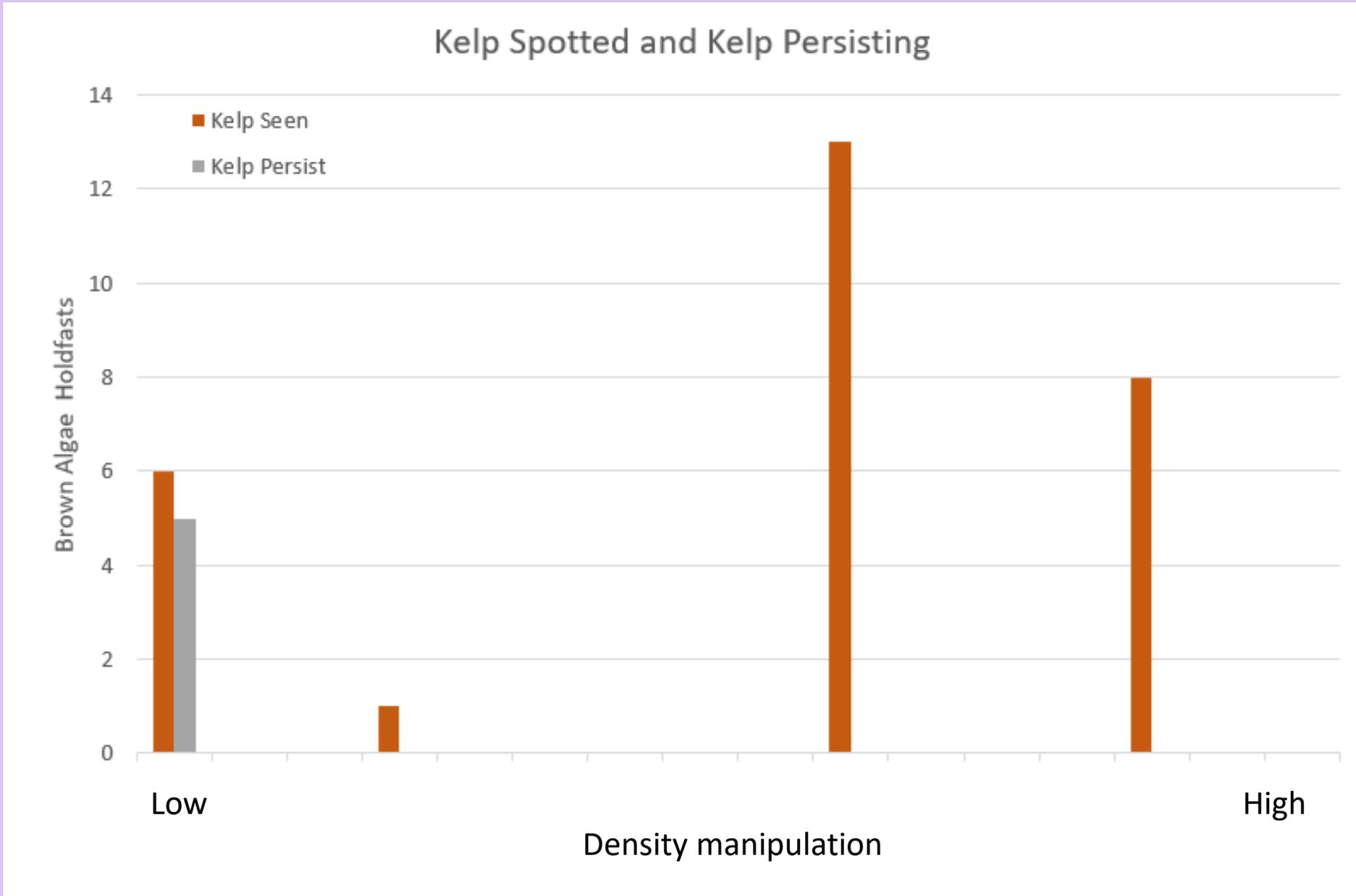
← MACROCYSTIS – GIANT KELP



Some kelp recruitment.

Bull kelp and giant kelp  
kelp persist more than 3  
weeks on the lowest  
threshold density.

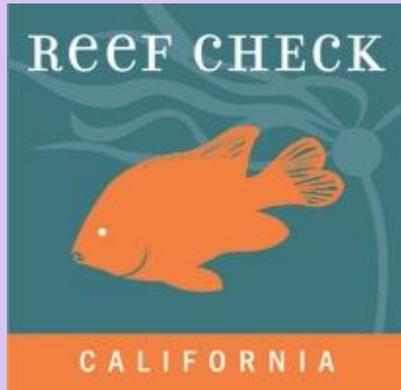
That kelp was eaten.



## Conclusions

- Purple urchin densities can be maintained close to target densities.
- Some initial kelp recruitment observed.
- Recovery might take longer than one summer, densities need to be maintained at target levels.
- Red urchin density increased from  $0.7 / \text{m}^2$  to  $0.85 / \text{m}^2$  after removal of purple urchins.
- Red urchins might prevent fast kelp recovery:
  - To investigate this red urchin removal would be necessary

# Thank you!



[g2kr.com](http://g2kr.com)  
[reefcheck.org](http://reefcheck.org)  
[data.reefcheck.org](http://data.reefcheck.org)

---

**From:** jon Holcomb [REDACTED]  
**Sent:** Tuesday, October 8, 2019 11:05 AM  
**To:** Gold, Mark@CNRA; [REDACTED] FGC  
**Subject:** Fw: Purple Sea Urchin removal funding...

My name is Jon Holcomb, I'm 74, a 46 year commercial diver still active in the Sea Urchin fishery. I am an alternate representative of N. California CSUC dive organization.

I developed a tool (modified air lift) to ease effort for divers and efficiently remove all sizes of very small Purple Urchins...a somewhat daunting, tedious, essential job ahead.

I seek no patent, funding or sales of this tool, only to share it (how to build) with all divers for it's worth. Josh Russo, leader of the 'Waterman's Alliance worked with us, all of the commercial divers near Fort Bragg still working to remove Purple Urchins in mass in 2018. Removal that funded our effort last year cost over \$100,000 and was 'donated' to this effort 'W/ no overhead for handling the money' by Josh and that excellent organization. We need continued effort, funding your insight and support. The number of divers here will increase with funding.

I include a short video of the last time I worked W/ other divers here, before the donated funds (Waterman's Alliance + F&G) were expended. The 'tool' I use, a modified air lift, was continuously modified over 8 months as Harry Barnard and I worked, rebuilding/improving and increasing our results from 100 lbs./ hr. to 250 lbs./ hr. in 50 trips.

One pound of tiny Purple Urchins equals between 57-150 urchins / lb.

N. Casper here was the 'single choice' the Waterman's alliance made for this effort and 'proof of concept'. 3 additional areas, not their choices, were included, diluting the results. (opinion)

I have no experience applying for a grant to continue this work. Is anyone in your organization willing or able to help us write an application for a grant to continue this work?

This short video shows the process and tool I believe improves efficiency.

Sincerely, Jon Holcomb [REDACTED]

<https://www.youtube.com/watch?v=zRREfgMbWbw>

look for additional video's on this subject if you wish by my name on You Tube.

## COMMITTEE STAFF SUMMARY FOR JULY 11, 2019

## 9. WHALE AND TURTLE PROTECTIONS – DUNGENESS CRAB FISHERIES

## Today's Item

Information Direction 

Receive informational presentations from DFW and discuss management strategies to provide additional whale and turtle protections in the Dungeness crab fisheries, including possible provisions for the recreational fishery.

## Summary of Previous/Future Actions

- FGC discussion of entanglement settlement and referral to MRC Apr 17, 2019; Santa Monica
- **Today's discussion Jul 11, 2019; MRC, San Clemente**

## Background

FGC has authority to regulate the recreational Dungeness crab fishery; however, authority over the commercial Dungeness crab fishery is held by DFW and the California State Legislature. In recent years, whale populations in California's waters have increased, leading to greater presence in Dungeness crab fishing grounds and an increased risk of entanglement in deployed fishing gear.

In 2017, following a significant increase in the number of whale entanglements off the West Coast, the Center for Biological Diversity sued DFW challenging DFW authorization of the crab fishery as a violation of Section 9 of the federal Endangered Species Act for take of blue and humpback whales and leatherback sea turtles. In Mar 2019 a settlement was reached that defines a series of interim measures to protect listed whales and turtles in the commercial Dungeness crab fishery while DFW pursues a habitat conservation plan (HCP) for federal government approval (exhibits 1-2). Additional industry perspective on the settlement is provided in exhibits 3-5, including a Jul 2019 article in National Fisherman.

At the Apr 2019 FGC meeting, a discussion was held to recap the provisions of the commercial fishery settlement agreement and explore its potential application to the recreational Dungeness crab fishery (Exhibit 6). Commenters at the meeting from the recreational fishery were not in support of applying the same restrictions to the recreational fishery, as it operates differently from the commercial fishery; they requested that the recreational fishery be considered independently. Based on differing public comment and multiple stakeholder requests, the topic was referred to the Jul MRC meeting for further discussion and to identify any possible provisions for the recreational fishery.

At this meeting, DFW will report on whale management strategies for the Dungeness crab fishery and provide MRC an opportunity to explore possible provisions for the recreational fishery in a timeframe consistent with DFW efforts to develop an HCP.

## Significant Public Comments

A commercial fishermen requested that MRC discussion about minimizing risk of whale entanglements in the Dungeness crab fishery be held in central California, in proximity to the

**COMMITTEE STAFF SUMMARY FOR JULY 11, 2019**

fishing grounds, rather than in southern California, which is outside the fishery range and presents a barrier to fishermen participating due to travel costs and time.

**Recommendation**

Request that DFW explore possible provisions for the recreational fishery in a time frame consistent with DFW efforts to develop an HCP, and bring options for discussion to the Nov 2019 MRC meeting.

**Exhibits**

1. DFW News: *Entanglement Settlement Protects Whales, Sea Turtles and California's Crab Fishery*, dated Mar 26, 2019
2. Center for Biological Diversity v. Bonham (Defendant), and Pacific Coast Federation of Fishermen's Associations and Institute for Fisheries Resources (Intervenor-Defendants), stipulation and [proposed] order staying case, filed Mar 26, 2019
3. California Dungeness Crab Fishing Gear Working Group statement, dated Mar 29, 2019
4. California Dungeness Crab Fishing Gear Working Group Evaluation Team advisory, dated Mar 19, 2019
5. Feature article "Dungie Deal" by Nick Rahaim, National Fisherman, Jul 2019 issue
6. Staff summary for FGC Agenda Item 25, Apr 2019 (for background purposes only)

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

## STAFF SUMMARY FOR APR 17, 2019

**25. WHALE AND TURTLE PROTECTION – DUNGENESS CRAB FISHERY****Today's Item**Information Action 

Receive update on legal settlement agreement to protect whales and sea turtles from entanglement in commercial Dungeness crab gear, and consider potential application to the recreational Dungeness crab fishery.

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

FGC has authority to regulate the recreational Dungeness crab fishery; however, authority over the commercial Dungeness crab fishery is held by DFW and the California State Legislature. 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, whale populations in California's waters have increased, leading to greater presence in Dungeness crab fishing grounds and an increased risk of entanglement in deployed fishing gear.

In 2015, DFW, in partnership with the National Marine Fisheries Service (NMFS) and California Ocean Protection Council (OPC), convened the Dungeness Crab Fishing Gear Working Group to "tackle the challenge of reducing the risk of whale entanglements in the California Dungeness crab fishery". In 2017, following a drastic increase in the number of whale entanglements off the West Coast, the Center for Biological Diversity sued DFW, challenging DFW authorization of the crab fishery as a violation of Section 9 of the federal Endangered Species Act for take of blue and humpback whales and leatherback sea turtles.

On Mar 26, 2019, DFW, together with the Center for Biological Diversity and the Pacific Coast Federation of Fishermen's Associations (as intervenor-defendant), announced they had reached a settlement and filed stipulation to stay the case (Exhibit 1); the settlement includes a series of interim measures to protect listed whales and turtles in the commercial Dungeness crab fishery, using the best available science, until DFW receives an incidental take permit from the federal government. The settlement (Exhibit 2) includes an "Exhibit A – Terms of Agreement" that defines specific measures to be taken.

In a Mar 29, 2019 statement (Exhibit 3), the Dungeness Crab Fishing Gear Working Group provided background, context, and risk assessment strategies for both commercial and recreational crab fisheries, which built on an advisory released by the group's Evaluation Team; the team had just convened on Mar 19 to proactively discuss and assess relative risk of entanglements following reports of increased humpback whale concentrations (Exhibit 4). Specifically, the Dungeness Crab Fishing Gear Working Group encouraged recreational Dungeness crab fishermen, as well as other fisheries using fixed gear, to review the risk assessment and consider fishing as minimal gear as possible to reduce vertical lines, and to avoid fishing in higher risk areas during spring and summer months (Exhibit 3).

This meeting provides FGC an opportunity to discuss the potential implications of the terms of the agreement for the recreational Dungeness crab fishery.

**STAFF SUMMARY FOR APR 17, 2019****Significant Public Comments (N/A)****Recommendation**

**FGC staff:** Discuss the potential implications of the terms of the agreement for the recreational Dungeness crab fishery; if FGC wishes to discuss further, consider referring to MRC for review and recommendation.

**Exhibits**

1. DFW News: *Entanglement Settlement Protects Whales, Sea Turtles and California's Crab Fishery*, dated Mar 26, 2019
2. Center for Biological Diversity v. Bonham (Defendant), and Pacific Coast Federation of Fishermen's Associations and Institute for Fisheries Resources (Intervenor-Defendants), stipulation and [proposed] order staying case, filed Mar 26, 2019
3. Dungeness Crab Fishing Gear Working Group statement, dated Mar 29, 2019
4. California Dungeness Crab Fishing Gear Working Group Evaluation Team advisory, dated Mar 19, 2019

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

# MANAGEMENT STRATEGIES TO PROVIDE ADDITIONAL WHALE AND TURTLE PROTECTION IN THE RECREATIONAL DUNGENESS CRAB FISHERY

**Ryan Bartling**

Marine Region

California Department of Fish and Wildlife



# MANAGING ENTANGLEMENT RISK IN THE RECREATIONAL DUNGENESS CRAB FISHERY

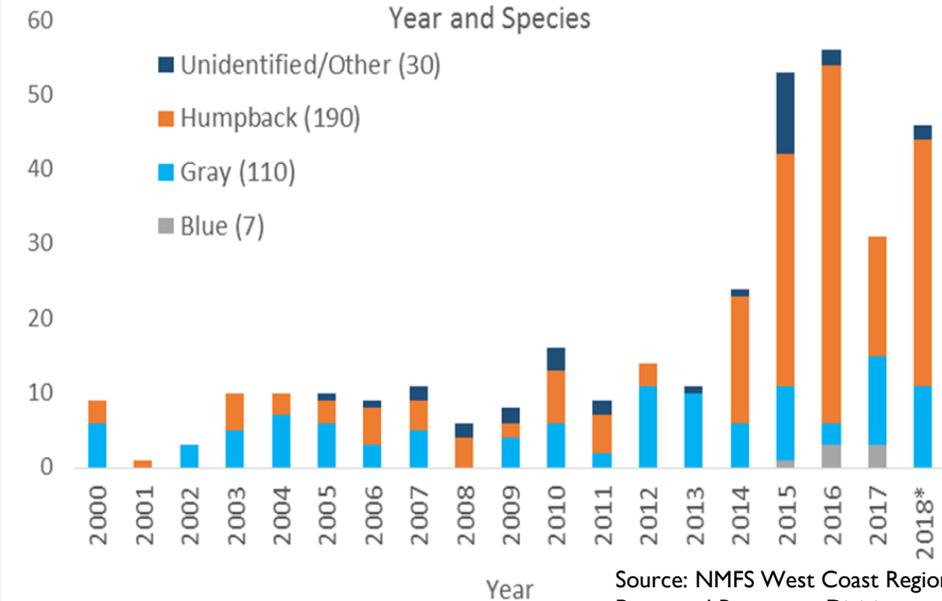
## Problem statement:

Since 2014, marine life entanglements have become more frequent on the U.S. West Coast. Species of greatest concern for entanglement include ESA listed Humpback whales, Blue whales and Leatherback Sea turtles. There have been 47 confirmed whale entanglements in Dungeness crab gear which includes two recreational gear entanglements. Gear identification is key to understanding the entanglement type and helps inform disentanglement response teams. Gear marking also helps fishery managers track gear and implement appropriate management measures to minimize entanglement risk.



Credit: Scott Benson - MMHSRP Permit 18786

Confirmed Whale Entanglements on the U.S. West Coast Per Year and Species



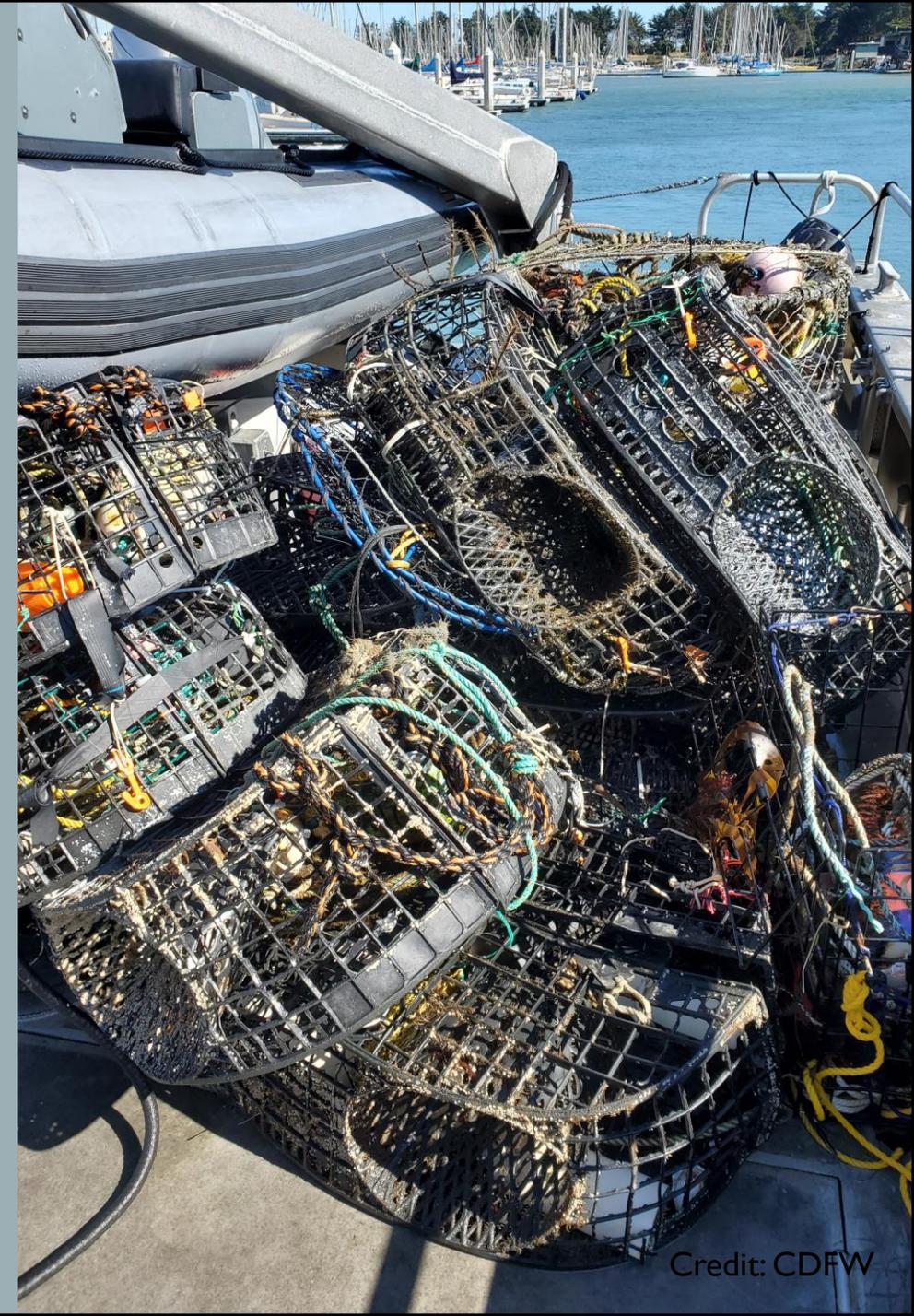
Source: NMFS West Coast Region Protected Resources Division



# EFFORTS TO MANAGE MARINE LIFE ENTANGLEMENT RISK

## CDFW is working to manage the risk:

- ✓ Developing a Conservation Plan for Humpback whales, Blue whales and Leatherback sea turtles
- ✓ Applying for Incidental Take Permit (ITP) under the Endangered Species Act (ESA)
- ✓ Developing a Risk Assessment and Mitigation Program in regulation for commercial Dungeness crab
- ✓ Recently implemented a Gear Retrieval Program for the commercial Dungeness crab fishery
- ✓ Completing a rulemaking to enhance marking for all commercial trap gear fisheries
- ✓ Conducting regular Risk Assessments for the commercial Dungeness crab fishery



Credit: CDFW



# UPDATING RECREATIONAL FISHERY REGULATIONS

## Rationale to support change :

- ✓ Protect marine life and listed species under the ESA
- ✓ Possible inclusion in Conservation Plan will allow for adaptive management
- ✓ Prevent economic harm to the commercial sector
- ✓ Recreational fishery is operated in similar locations with similar gear configurations
- ✓ Simple low-cost common-sense management strategies are available



Credit: CDFW



# RECREATIONAL FISHERY PROPOSALS

## Common-sense management strategies:

- ✓ Enhanced Gear Marking
- ✓ Trap Limit
- ✓ Report Card
- ✓ Service Interval Requirement
- ✓ Gear Specification/Configuration Requirement
- ✓ Director Authority for In-season Changes to Minimize Risk



Credit: CDFW



# RECOMMENDED NEXT STEPS

- MRC Recommendation
- Commission Direction
- Stakeholder Engagement/Discussion
- Possible Regulatory Timeline



Credit: CDFW



**Ryan Bartling**  
Senior Environmental Scientist  
California Department of Fish and Wildlife

**Ryan.Bartling@wildlife.ca.gov**  
**(415) 761-1843**

More information:

[www.wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries](http://www.wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries)

[www.opc.ca.gov/whale-entanglement-working-group](http://www.opc.ca.gov/whale-entanglement-working-group)



**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](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.

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 JUL 11, 2019

## 7. COASTAL FISHING COMMUNITIES PROJECT

## Today's Item

Information Direction 

Receive staff update on FGC's 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                         | Mar 20, 2019; MRC, Sacramento          |
| • <b>Today's update on progress</b>              | <b>Jul 11, 2019; MRC, San Clemente</b> |

## 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 coastal 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. Staff provided the *Jul 2018 Staff Report on California Coastal Fishing Communities Meetings* 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 MRC's Nov 2018 meeting, stakeholders requested that the staff report be revised to integrate the public comments, and to add more detailed information and an analysis of options to provide greater context before MRC consider recommending any specific actions moving forward. MRC recommended, and at its Dec 2018 meeting FGC approved, that staff (a) revise the Jul 2018 staff report based on submitted public feedback; (b) develop a more comprehensive report in collaboration with interested stakeholders to provide more detailed background and an analysis of options for FGC action (overall and port-specific strategies); and (c) report back to MRC in Mar 2019 on progress (see Exhibit 2 for background).

At the Mar 2019 MRC meeting, staff provided an update highlighting efforts in four focal areas identified to help address MRC direction: (1) staff report revisions, (2) public outreach, (3) partner efforts, and (4) collaboration. Following the Mar MRC meeting, staff completed revisions to the Jul 2018 staff report, including integrating stakeholder comments and clarifying staff-recommended options for potential development (Exhibit 3), and continued efforts in project focal areas.

Today, staff delivers the final coastal fishing communities meetings staff synthesis report (Exhibit 3) and will report on progress made on all focal project areas.

**COMMITTEE STAFF SUMMARY FOR JUL 11, 2019****Significant Public Comments (N/A)****Recommendation**

Receive the *Final Staff Synthesis Report on California Coastal Fishing Communities Meetings* (Jul 2019) as complete. If supported by MRC, staff can begin working with partners to develop a more in-depth report on coastal fishing communities' resilience in California. Discuss prioritizing the recommendations outlined in the final staff report and provide input on where to focus staff efforts as a more in-depth analysis and reporting ensues.

**Exhibits**

1. Staff summary from Nov 4, 2015 MRC meeting (for background purposes only)
2. Staff summary from Nov 11, 2018 MRC meeting (for background purposes only)
3. Final staff synthesis report on coastal fishing communities meetings and summary of stakeholder comments, dated Jul 2019 (*to be provided at or before MRC meeting*)

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

# California Fish and Game Commission Coastal Fishing Communities Project

## Draft Definition of Coastal Fishing Community Based on October 18, 2019 Stakeholder Work Session and Stakeholder-Suggested Changes

### Background

At its July 11, 2019 meeting, the Marine Resources Committee (MRC) requested staff to work with interested stakeholders to develop a draft working definition for the term “coastal fishing community.” Commission staff scheduled a stakeholder work session for October 18, 2019 and invited stakeholders to participate either at the California Fish and Game Commission’s office or via WebEx. Approximately 25 stakeholders representing a broad array of interests responded, and 18 of those stakeholders participated in the work session.

This document includes the draft working definition developed during the work session (see Section I below). There was general consensus around a broad definition, which used the federal Magnuson–Stevens Fishery Conservation and Management Act definition as its basis; however, there was interest from a sub-set of stakeholders to focus the definition more narrowly on the fishing industry. As a result, subsequent to the work session, the sub-set of stakeholders submitted to Commission staff a proposed revised definition with rationale (Section II A) and, based on staff feedback, submitted an updated version to further refine for clarity (Section II B). Feedback from work session participants is in the accompanying table.

### I. Work Session Draft Definition

Developed during an October 18, 2019 stakeholder work session, the work session participants proposed to define a “**coastal fishing community**” as:

*“... a social, cultural, economic, and/or place-based group whose members are dependent upon or engaged in commercial, recreational, or subsistence fishing to meet social or economic needs; this includes, but is not limited to, businesses and organizations that depend on or support fishing by providing goods and services, including infrastructure.”*

### II. Proposed Revised Version of Work Session Draft Definition

#### (A) October 23, 2019 Proposed Version

Submitted to staff and all work session participants, a sub-group (Mike Conroy, Peter Flournoy, Steve Scheiblaue, Diane Pleschner-Steele, and Bob Bertelli) proposed to define a “**coastal fishing community**” as:

*“... a social, cultural, economic, and/or place-based group whose members are wild capture seafood harvesters dependent upon or engaged in commercial, recreational, or subsistence fishing to meet the social or economic needs of the community; this includes, but is not limited to, businesses and organizations that depend on or support fishing by providing goods and services, including infrastructure.*

*“A fishing community may be a subset or member of larger or associated coastal communities which have an interest in and/or are dependent on healthy ocean ecosystems.”*

*Rationale*

1. We recommend adding “wild capture seafood harvesters” in an effort to differentiate fishing from aquaculture. Currently, aquaculture is not considered commercial fishing, so we propose the additional language to alleviate any potential confusion.
2. Our second proposed change is designed to eliminate potential confusion about the intended scope of the term. As we heard during the work session there was some confusion about which groups/organizations could claim community membership. In our opinion, non-consumptive activities, like whale watching, scuba diving and bird watching, are not activities which warrant inclusion in the term “Fishing Community.”
3. We propose the final sentence to acknowledge that non-fishing interests, like members of a fishing community, could be members of a larger “Coastal Community.”

**(B) October 28, 2019 Revised Proposed Version**

Submitted to staff as a revised version to replace the October 23, 2019 version after staff feedback, the sub-group proposed to define a “**coastal fishing community**” as:

*“... a social, cultural, economic, and/or place-based group whose members are ~~wild capture seafood harvesters~~ fishermen dependent upon or engaged in commercial, recreational, or subsistence fishing to meet the social or economic needs of the community; this includes, but is not limited to, businesses and organizations that depend on or support fishing by providing goods and services, including infrastructure.*

*A fishing community may be a subset or member of larger or associated coastal communities which have an interest in and/or are dependent on healthy ocean ecosystems.”*

*Rationale*

1. We recommend adding “fishermen” in an effort to differentiate fishing from aquaculture. Currently, aquaculture is not considered commercial fishing, so we propose the additional language to alleviate any potential confusion.
2. Our second proposed change is designed to eliminate potential confusion about the intended scope of the term. As we heard during the work session there was some confusion about which groups/organizations could claim community membership. In our opinion non-consumptive activities, like whale watching, scuba diving and bird watching, are not activities which warrant inclusion in the term “Fishing Community.”
3. We propose the final sentence to acknowledge that non-fishing interests, like members of a fishing community, could be members of a larger “Coastal Community.”

**California Fish and Game Commission - Marine Resources Committee  
Coastal Fishing Communities Project**

**Stakeholder Feedback on Two Versions of Coastal Fishing Community Definition**

*October 24, 2019*

1. Which is preferred definition?	2. Can you live with both?	2b. Reason offered	3. Do you have any additional comments to share?
Work session version			No
Work session version	Yes	I can absolutely live with both definitions, as long as shore-based subsistence anglers are encompassed within the definition and the definition includes "cultural, social, economic and/or place-based" as defining characteristics.	I want to be sure that the definition will be inclusive to all those who are connected to fishing activities, without casting too wide of a net. I think the definition we developed during the webinar does just that, but the offered suggestion does as well. I agree with the concern that aquaculture should not be considered a fishing activity, but I am a bit concerned that the propose definition change is a bit narrower.
Work session version	No		<p>I disagree with the new proposed definition as presented in the attached PDF (Conroy, Flournoy, Scheiblaue, Pleschner-Steele and Bertelli). As I talked about in the work session, I believe that non-consumptive and non-extractive users are part of fishing communities.</p> <p>Fish are a valuable natural resource owned by the public, and are valuable beyond the economic value of extraction to harvesters. Many fish species are valuable to wildlife enthusiasts and their economic chains, directly and indirectly through their role in the food web (ex. SCUBA divers, birders, whale watchers). There are members of the public who feel that extraction of any type is a detriment to the larger social, economic, and ethical fabric of our society. Even if valuing purely monetarily, there is a wide body of literature citing the value of fish left in the water in terms of the ecosystem services they provide to the public. Additionally, fishing nearly always comes with collateral damage to the larger ecosystem through habitat perturbation and pollution, at a cost to the public.</p>
(continued from previous comment)			<p>I hope this illustrates the differing values and ownership of fish and fisheries by a public that is larger than those who have been granted the privilege of harvesting them as proposed in the revised definition. "Fishing" is an issue that the larger public has an interest in, and as we are defining "fishing community," especially at a political level as large and diverse as the state of California, I think that not only extractors and direct economic supporters should be considered as part of that social fabric. I think that those directly involved should be the heart and central part of that definition, but it must be wide enough to recognize the larger public value of fisheries and the social connectivity that exists within a community of people that have diverse interests. I would like to emphasize here that I am not making a policy or values statement about who or which of these public members should or should not have access to the public good that fish and fisheries are, only that there is a wide and diverse group of the public who is invested in fishing and a communities definition should in accordance recognize this.</p>

1. Which is preferred definition?	2. Can you live with both?	2b. Reason offered	3. Do you have any additional comments to share?
(continued from previous comment)			<p>“Fishermen/fisherwomen/fishers” should include only those who extract or harvest; “fishing community” implies a larger group of individuals who are invested in fishing, including those who value non-extractive uses.</p> <p>During the call we discussed and agreed that fishing communities have multiple lens by which they can be defined: geographic, species, port, gear type, industry sector, part of supply chain, etc. We discussed a vendor near a wharf and a company that sells boxes to fish processors. Each lens begets a different group of individuals, drawing slightly different circles within a theoretical Venn diagram. By several of these definitions non-extractive users are included. For example geography, the lens most commonly used by managers; the number of harvesters in Monterey is small, but the number of individuals living in that city and have an interest in fish and fishing is large and includes non-extractors. Steve I believe mentioned tourism during the work session.</p>
(continued from previous comment)			<p>Specifically, I disagree with the language provided in the attached PDF regarding “wild capture harvesters.” Harvesters is a word that implies inclusion of only a very small group of individuals, and excludes non-extractive users. I worry that this small of a definition could exclude even some within the extractive industries – ex, what about processing plant workers? The submitters also added “...of the community” (line three) and noted below that this was specifically intended to exclude non-extractive users. I find this wording and intent confusing and a bit clunky (defining community with the word community seems like potentially bad practice), but taking their intent as described, I disagree.</p>
Work session version	No		
Revised version	No	No, I can't support the other definition. I ran it by several individuals that represent Sport and Commercial fishing interests. They would not support the original definition.	I appreciate the submitters efforts to include a wider swath of the public by creating an entirely new definition of “coastal community,” however this seems beyond the administrative scope and intent of this exercise, and, as directly stated, an effort to further exclude non-extractive users from the definition of fishing communities.
Revised version	Yes		
Revised version			<p>The definition as provided from the work session was what I would consider a minimally acceptable, by some reads it could be interpreted as already excluding non-extractive users. Maggie and Elizabeth, your verbal affirmation in the work session that it does include non-extractive users was the reason I did not submit my own revised definition or further push my viewpoint during the work session (also in the interest of consensus and compromise). This rewrite to explicitly exclude non-extractive interests is now unacceptable.</p>

1. Which is preferred definition?	2. Can you live with both?	2b. Reason offered	3. Do you have any additional comments to share?
Revised version	No	I cannot live with the first definition as a definition of a FISHING community, especially given the confusion on the call over who was a member. Fishing is fishing (not whale watching, eNGO groups etc. etc.).	If California wants to protect its FISHING communities, there needs to be clear recognition that the definition applies to wild capture seafood harvesters and processors, and related businesses. Everyone else can be lumped into the broader coastal community definition. This also speaks to the protections and support for the commercial FISHING industry and recreational boating industries offered under the California Coastal Act.
Revised version	No	No, the prior definition contains ambiguities which could create confusion and you really cant have two alternate (and different) definitions for the same term.	No
Revised version	No		Yes.To explain, we are attempting to craft an artful definition. My gauge, or metric, for what rings true for "fishing community", is based on the 42 years I worked on the waterfront, working with fishermen and women, both commercial and anglers. I grew a feeling for the community that was/is a fishing community. When I matched the definition, above, with my life experience working in fishing communities, doesn't ring true. It strays from what I feel needs to be captured in trying to define this. I heard other voices and concerns on the call we had, concerns over inclusion. We think we have addressed those concerns by also pointing out that the related concept of "coastal communities" can embrace these concerns, and concern for the broader goal of achieving healthy ocean ecosystems.
Revised version	No	No, I cannot live with the first definition, and I much prefer the modified definition. I believe it makes specific points that the earlier conference call definition does not address. First , fishing versus aquaculture. Second, consumptive uses versus non-consumptive uses. This is not to denigrate the possible importance to the overall community that whale watching, bird watching, scuba diving, snorkeling, and kayaking may have; nor is it to shut out the voices of those organizations that are concerned about ocean plastics, turtles, porpoise, seals, etc., however, these organizations are not part of the fishing community even though they sometimes work with the fishing community to solve concerns. There are many organizations interested in healthy diets, fresh, and local seafood, but they are not part of the fishing community. They, like the non-consumptive users and aquaculture may be part of the larger community of which the fishing community is a segment.	In a sense we were told on the conference call not to be too concerned about being precise in the definition because there would be opportunities to change it as it went to the MRC and then to the Commission. As I mentioned, I disagree with that approach. This is the product of several meetings over 2 years, and I think it will carry some weight. I think when it gets to the MRC and the Commission, if it stays roughly as we have suggested, my constituents will be arguing against any change that those entities might make. Finally, at some point the Commission and the Department should, sooner rather than later, inform the public of the reason for wanting a definition of fishing community, and what the likely uses are for such a definition.



Commissioner Murray and Commissioner Silva  
Co-Chairs, California Fish and Game Commission's Marine Resources Committee  
Natural Resources Building  
12<sup>th</sup> Floor Conference Room  
1416 Ninth Street, Room 1206  
Sacramento, CA 95814

October 22, 2019

RE: Proposed "Coastal Fishing Community" Definition Comment

Dear Honorable Committee Co-Chairs Commissioner Murray and Commissioner Silva,

The Congressional Sportsmen's Foundation supports the Marine Resources Committee's (MRC) inclusion of recreational anglers in the definition of "coastal fishing community." However, by specifying its members as "harvesters," some recreational anglers will likely be excluded from the coastal fishing community definition.

Established in 1989, the Congressional Sportsmen's Foundation (CSF) works with the Congressional Sportsmen's Caucus, the largest, most active bipartisan caucus on Capitol Hill with nearly 250 Members of Congress from both the House and Senate. Fifteen years ago, CSF extended the legislative network from Washington, DC to states across the country, establishing the bipartisan National Assembly of Sportsmen's Caucuses, which today is made up of 49 state legislative caucuses, and includes over 2,500 legislators. Ten years ago, CSF established a bipartisan Governors Sportsmen's Caucus, which includes more than half the governors from throughout the country. Together, this collective force of bipartisan elected officials works to protect and advance hunting, angling, recreational shooting and trapping for the nearly 40 million sportsmen and women who spend \$90 billion annually on our outdoor pursuits.

In 2018, recreational fishing licenses generated \$61.83 million in funding for the California Department of Fish and Wildlife, #1 in national ranking for license sale revenue, and \$16.51 million in funding through the Dingell-Johnson/ Wallop-Breaux Act (or the Federal Aid in Sport Fish Restoration Act). Due to the important contributions of California's recreational anglers to fish and aquatic resource conservation, all recreational fishing should be expressly included in the definition of a coastal fishing community.

Optimum yield for recreational anglers is generally more related to abundance and encounters with the opportunity to harvest fish if they choose, but retain the option to catch and release as well. Defining the coastal fishing community as wild capture seafood “harvesters” would potentially exclude the catch and release segment of recreational anglers.

The definition as previously proposed “A fishing community is a social, cultural, economic, and/or place-based group whose members are dependent upon or engaged in commercial, recreational, or subsistence fishing to meet social or economic needs...” is prescriptive enough to exclude non-consumptive users of concern.

CSF respectfully recommends the MRC not define members of the coastal fishing community as “harvesters” to avoid inadvertently excluding a portion of the recreational anglers.

Sincerely,

A handwritten signature in cursive script that reads "A. Cline".

Aoibheann Cline  
Western States Coordinator  
Congressional Sportsmen’s Foundation

**Marine Resources Committee (MRC) 2019/2020 Work Plan**  
**Scheduled Topics and Timeline for**  
**Items Referred to MRC from California Fish and Game Commission**  
Updated October 23, 2019

Topic	Category	2019	2020	
		NOV	MAR	JUL
		Sacramento	Monterey Area	San Clemente
<b>Planning Documents</b>				
MLMA Master Plan for Fisheries - Implementation Updates	Master Plan Implementation	X	X	X
Abalone FMP / ARMP Update	FMP	X	X/R	
Aquaculture Programmatic Environmental Impact Report (PEIR)	Programmatic Plan			X
<b>Regulations</b>				
Herring Eggs on Kelp	DFW Project/ Rulemaking	X		
Experimental Fisheries Permit Phase II	DFW Project/ Rulemaking	X	X	
Aquaculture Lease Best Management Practices (BMP) Plan Requirements	DFW-FGC Project/ Rulemaking			
Kelp & Algae Commercial Harvest	DFW Project/ Rulemaking	X	X/R	
<b>Emerging/Developing Management Issues</b>				
Kelp Restoration and Recovery		X		
Aquaculture State Water Bottom Leases: Existing and future lease considerations	Lease Management Review		X	
Cowcod Recovery ( <i>added Oct 2019</i> )			X	
<b>Special Projects</b>				
California's Coastal Fishing Communities	MRC project	X	X	
<b>Informational / External Topics of Interest</b>				
Whale and Turtle Protections in the Management of the Dungeness Crab Fisheries		X	X	
Stakeholder informational presentation on aspects of State recreational fisheries management not under FGC regulatory authority				
Stakeholder informational presentation on aspects of State commercial fisheries management not under FGC regulatory authority			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)

10/30/2019

				2019		2020																				
For FGC Staff Use				NOV	DEC		JAN	JAN	FEB	MAR	MAR	APR		MAY	MAY	JUN		JUL	AUG	AUG		SEP	OCT			
				5	11	12	16	17	5	6	TBD	17	15	16	14	14	24	25	21	18	19	20	17	14	15	
QUARTERLY EFFECTIVE	DFW/RJ ANALYST	FGC ANALYST	LEAD	REGULATORY CHANGE CATEGORY	ACTION DATE, TYPE AND LOCATION	MRC	FGC	WRC	TC	FGC	WRC	MRC	FGC	TELECONFERENCE	WRC	FGC	MRC	TC	FGC	WRC	SEP	FGC	WRC			
						SACRAMENTO	SACRAMENTO	LOS ANGELES AREA	LOS ANGELES AREA	SACRAMENTO	SACRAMENTO	SANTA ROSA	SACRAMENTO	SANTA ROSA	SANTA ANA AREA	SAN CLEMENTE AREA	FORTUNA AREA	FORTUNA AREA	SACRAMENTO	OAKLAND						
File Notice w/OAL by Notice Published						10/15/19	10/25/19	12/10/19	12/20/19	02/18/20	02/28/20	04/28/20	05/08/20	6/30/20	07/03/20	08/18/20	08/28/20									
Title 14 Section(s)																										
*	MR	ST	MR	Recreational and Commercial Pacific Herring (Fishery Management Plan Implementation)	26.50, 28.50, 28.60, 28.62, 55.00, 55.01, 55.02, 163, 163.1, 163.5, 164 and 705			E 1/1																		
*	MR	CC	MR	Experimental Fishing Permit (EFP) Program (Phase I)	90 and 704			E 1/1																		
*	MR	JS	WLB	Possession of Nongame Animals (Nutria)	473		A						E 4/1													
	OA	SF	FB	Klamath River Basin 2084 (Emergency)	7.50(b)(91.2)		EE 12/24																			
	OA	SF	FB	Klamath River Basin 2084 (Emergency) (First 90-day Extension)	7.50(b)(91.2)		A	E 12/24 through 3/22					EE 3/23													
	OA	SF	FB	Klamath River Basin 2084 (Emergency) (Second 90-day Extension)	7.50(b)(91.2)					A				E 3/23 through 6/20						EE 6/21						
	OA	SF	FB	Klamath River Basin 2084 (Implementing Certificate of Compliance)	7.50(b)(91.2)		N			D				A						E 6/21						
	MR	ST	WLB	Wildlife Areas/Public Lands and Ecological Reserves	550, 550.5, 551, 552, 630 and 702		N			D				A						E 7/1						
	MR	JS	WLB	Mammal Hunting	360, 361, 362, 363, 364 and 364.1		N			D				A						E 7/1						
	MR	JS	WLB	Waterfowl (Annual)	502, 507		N			D				A						E 7/1						
	OA	CC	FB	Central Valley Sport Fishing (Annual)	7.50(b)(5), (68), (124), (156.5)		N			D				D	A					E 7/1						
	OA	CC	FB	Klamath River Basin Sport Fishing (Annual)	7.50(b)(91.1)		N			D				D	A					E 7/1						
	OA	JS	FB	Simplification of Statewide Inland Fishing Regulations <sup>2</sup>	5.00, 7.00, 7.50, 8.10			V	V		R							N				D			A	

**RULEMAKING SCHEDULE TO BE DETERMINED**

			MR	Santa Cruz Harbor Salmon Fishing (FGC Petition #2016-018)	TBD																					
			MR	European Green Crab (FGC Petition #2017-006)	TBD																					
			WLB	Wildlife Areas/Public Lands <sup>1</sup>	TBD																					
*	MR	CC	MR	Experimental Fishing Permit (EFP) Program (Phase II)	TBD																					
*			MR	Commercial Kelp and Algae Harvest Management	165, 165.5, 704																					
*				Possess Game / Process Into Food	TBD																					
*			OGC	American Zoological Association / Zoo and Aquarium Association	671.1																					
				Night Hunting in Gray Wolf Range (FGC Petition #2015-010)	474																					
				Shellfish Aquaculture Best Management Practices	TBD																					
*				Ban of Neonicotinoid Pesticides on Department Lands (FGC Petition #2017-008)	TBD																					
*			MR	Commercial Pink Shrimp Trawl	120, 120.1, 120.2																					
			WLB	Upland Game Bird (Annual for 2021)	300																					
*			MR	Ridgeback Prawn Incidental Take Allowance	120(e)																					

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

1: Includes FGC Petition #2018-003 & FGC Petition #2018-005; 2: Includes FGC Petition #2018-008