The California Collaborative Fisheries Research Program (CCFRP): Monitoring nearshore fishes in CA’s MPAs with the help of the community

Jen Chiu
CCFRP Statewide Coordinator
Marine Life Protection Act (MLPA)

- Passed in 1999
- Mandated the creation of a network of marine protected areas (MPAs) to protect diversity and ecosystem function

http://www.dfg.ca.gov/mlpa/
Marine Protected Area (MPA) vs. Reference Site (REF)

- **State Marine Reserve (SMR)** – fully protected; all commercial and recreational harvest prohibited

- **State Marine Conservation Area (SMCA)** – limited recreational and/or commercial extraction permitted

- **State Marine Park (SMP)** – recreational harvest permitted

- **Reference Site (REF)** – areas open to both recreational and commercial fishing; subject to California Dept. of Fish and Wildlife (CDFW) rules and regulations (e.g., minimum/maximum sizes, seasonal closures, daily bag limits)
Why Evaluate MPAs?

1. It is a priority adopted by Central Coast regional stakeholders

2. It is required by MLPA (to ensure MLPA goals are met)

3. Critical to enabling adaptive management
The Benefits of Collaboration

- Engage stakeholders in both science and management

- Utilize different areas of expertise to develop protocols and collect data

- Create a shared understanding of resources and facilitate communication among user groups

- Reduce costs associated with data collection
  - more information gathered for MPA monitoring and fisheries management
California Collaborative Fisheries Research Program (CCFRP)

- fishery-independent (catch-and-release) study that combines the expertise and ideas of:
  - the fishing community
  - academic scientists
  - resource managers

- conducts scientifically rigorous data collection and analyses for MPA monitoring and fisheries management

Dean Wendt
Rick Starr
Center for Coastal Marine Sciences
Study Areas - MLML

Año Nuevo SMR

Point Lobos SMR
CCFRP Summary (2007 to 2016)

MLML and Cal Poly

- 12 CPFVs, 20 skippers, 4 harbors
- 325 sampling days at sea
- 901 volunteer anglers
- 11,700 hours of fishing
- 82,457 fishes (52 spp.)
- 40,368 fishes tagged and released
## Statewide Expansion of CCFRP

<table>
<thead>
<tr>
<th>Region</th>
<th>Institution</th>
<th>MPAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>Humboldt State</td>
<td>South California, Pacifica SMR</td>
</tr>
<tr>
<td>North Central</td>
<td>Bodega Marine Labs</td>
<td>Ten Mile SMR, SMR, South Cape Mendocino</td>
</tr>
<tr>
<td>Central</td>
<td>Moss Landing Marine Labs</td>
<td>SE Farallon Islands, Año Nuevo, SMR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Point Lobos SMR, Cal Poly Piedras Blancas</td>
</tr>
<tr>
<td>South</td>
<td>UC Santa Barbara</td>
<td>Carrington Point, SMR, Anacapa Island, SMR &amp; SMCA</td>
</tr>
<tr>
<td></td>
<td>Scripps Institution of Oceanography</td>
<td>Laguna Beach SMR, Swami’s SMR, South La Jolla SMR</td>
</tr>
</tbody>
</table>

- **6** Academic institutions
- **12** Ports
- **14** MPAs
- **72** Sampling trips
- **25,125** Fishes caught and released in the 2017 season from **65** different species
In total, with all regions combined from 2007-2017, CCFRP has now caught and released 107,582 fishes from 84 different species with the assistance of 1,159 individual volunteer anglers.
CCFRP: Most Common Fishes

- Black Rockfish
- Blue Rockfish
- Deacon Rockfish
- Canary Rockfish
- China Rockfish
- Copper Rockfish
- Gopher Rockfish
- Kelp Rockfish
- Lingcod
- Olive Rockfish
- Vermilion Rockfish
- Yellowtail Rockfish
How many fish caught by gear type?
(All species combined: MLML only)

- Bar: 16366 (29.6%)
- Shrimpfly No Bait: 19476 (35.2%)
- Shrimpfly with Bait: 19420 (35.1%)
### Species Catch by Gear Type: 2007-2017 (MLML only)

<table>
<thead>
<tr>
<th>Species</th>
<th>Bar</th>
<th>Shrimpfly with Bait</th>
<th>Shrimpfly No Bait</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Rockfish</td>
<td>28%</td>
<td>33%</td>
<td>39%</td>
</tr>
<tr>
<td>Blue Rockfish</td>
<td>26%</td>
<td>34%</td>
<td>40%</td>
</tr>
<tr>
<td>Canary Rockfish</td>
<td>25%</td>
<td>42%</td>
<td>33%</td>
</tr>
<tr>
<td>China Rockfish</td>
<td>28%</td>
<td>42%</td>
<td>30%</td>
</tr>
<tr>
<td>Copper Rockfish</td>
<td>39%</td>
<td>39%</td>
<td>22%</td>
</tr>
<tr>
<td>Gopher Rockfish</td>
<td>26%</td>
<td>46%</td>
<td>27%</td>
</tr>
<tr>
<td>Kelp Rockfish</td>
<td>39%</td>
<td>33%</td>
<td>28%</td>
</tr>
<tr>
<td>Lingcod</td>
<td>54%</td>
<td>26%</td>
<td>20%</td>
</tr>
<tr>
<td>Olive Rockfish</td>
<td>48%</td>
<td>19%</td>
<td>33%</td>
</tr>
<tr>
<td>Vermilion Rockfish</td>
<td>42%</td>
<td>36%</td>
<td>22%</td>
</tr>
<tr>
<td>Yellowtail Rockfish</td>
<td>25%</td>
<td>34%</td>
<td>41%</td>
</tr>
</tbody>
</table>
Species Catch by Gear Type: 2007-2017

Black Rockfish: 28% Bar, 33% Shrimpfly with Bait, 39% Shrimpfly No Bait
Blue Rockfish: 26% Bar, 34% Shrimpfly with Bait, 40% Shrimpfly No Bait
Canary Rockfish: 25% Bar, 42% Shrimpfly with Bait, 33% Shrimpfly No Bait
China Rockfish: 28% Bar, 42% Shrimpfly with Bait, 30% Shrimpfly No Bait
Copper Rockfish: 39% Bar, 39% Shrimpfly with Bait, 22% Shrimpfly No Bait
Gopher Rockfish: 26% Bar, 46% Shrimpfly with Bait, 27% Shrimpfly No Bait
Kelp Rockfish: 39% Bar, 33% Shrimpfly with Bait, 28% Shrimpfly No Bait
Lingcod: 54% Bar, 26% Shrimpfly with Bait, 20% Shrimpfly No Bait
Olive Rockfish: 48% Bar, 19% Shrimpfly with Bait, 33% Shrimpfly No Bait
Vermilion Rockfish: 42% Bar, 36% Shrimpfly with Bait, 22% Shrimpfly No Bait
Yellowtail Rockfish: 25% Bar, 34% Shrimpfly with Bait, 41% Shrimpfly No Bait
Data collection during fishing

<table>
<thead>
<tr>
<th>Species</th>
<th>Str #</th>
<th>Tag ID</th>
<th>Fl (cm)</th>
<th>Sex</th>
<th>Cond</th>
<th>Depth (ft)</th>
<th>Lat</th>
<th>Long</th>
<th>WP #</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gopher</td>
<td>2</td>
<td>25</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. Blue</td>
<td>11</td>
<td>22</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kelp</td>
<td>7</td>
<td>30</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kelp</td>
<td>2</td>
<td>29212</td>
<td>35</td>
<td></td>
<td></td>
<td>30.856</td>
<td>57.338</td>
<td>123</td>
<td>Fin Clip</td>
<td>HD-&gt;eye, dropped on deck</td>
</tr>
<tr>
<td>Kelp</td>
<td>2</td>
<td>29211</td>
<td>34</td>
<td></td>
<td></td>
<td>30.197</td>
<td>57.257</td>
<td>121</td>
<td>Fin Clip</td>
<td></td>
</tr>
<tr>
<td>Ling</td>
<td>3</td>
<td>29220</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gopher</td>
<td>12</td>
<td>29227</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gopher</td>
<td>13</td>
<td>29394</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gopher</td>
<td>13</td>
<td>29228</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verm</td>
<td>11</td>
<td>29229</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ling</td>
<td>8</td>
<td>29230</td>
<td>56</td>
<td></td>
<td></td>
<td>30.947</td>
<td>57.207</td>
<td>125</td>
<td></td>
<td>damage to the eye</td>
</tr>
</tbody>
</table>

Catch Data
- angler number
- species
- total length (cm)
- fish condition
- tag number
- start/stop times
- GPS coordinates
Rockfish are diverse & long-lived!

- ~70 northeast Pacific species
  - 100+ world-wide
- max depth: 2,830 m (9,285 ft)
- Yelloweye Rockfish can live to 120 years; Shortraker Rockfish at least 157 years
Maximizing Survivorship

- sample ≤ 120 feet
- fish without barbed hooks
- use careful handling techniques
- keep surface time ≤ 5 min
- descend fishes, when necessary
- regularly replace seawater
- only tag fishes in good condition
REWARD
for tag return information

On 14 November 2010, you caught Copper Rockfish #13387. This fish was tagged as part of the CA Collaborative Fisheries Research Program conducted by Rick Starr (Moss Landing Marine Laboratories) and Dean Wendt (CalPoly, San Luis Obispo). The purpose of this project is to monitor central California’s marine protected areas (MPAs) and collect information for fisheries management.

Copper Rockfish

Tag No. 13387
Tag Recapture
Date 21 Jul 2008 14 Nov 2010
Latitude 36.557 36.560
Longitude -121.941 -121.941
Depth 47 ft 65 ft
Length 31 cm / 12.2 in 44.5 cm / 17.5 in

Information about your fish:

- date caught
- species and condition
- total length (snout to end of tail)
- tag number and whether or not it was bio-fouled
- GPS coordinates
- capture depth

Since 2007, Rick Starr (California Sea Grant Extension Program / Moss Landing Marine Laboratories) and Dean Wendt (California Polytechnic State University, San Luis Obispo) have been working with commercial fishermen, charter boat captains and recreational anglers to tag and release nearshore fishes out of Pillar Point, Monterey, Morro Bay and Port San Luis. The objective of this study is to obtain growth, movement and mortality rates of fishes found near Año Nuevo, Point Lobos, Piedras Blancas and Point Buchon MPAs in order to gain a better understanding of these economically important species.

If you catch a tagged fish (whether you keep it or throw it back), please record and report:

- date caught
- species and condition
- total length (snout to end of tail)
- tag number and whether or not it was bio-fouled
- GPS coordinates
- capture depth

Moss Landing Marine Laboratories
8272 Moss Landing Road
Moss Landing, CA 95039

San Luis Obispo Science & Ecosystem Alliance
California Polytechnic State University
San Luis Obispo, CA 93407

e: seagrant@mlml.calstate.edu
e: ccms-fisheries@calpoly.edu
p: (831) 771-4479
p: (805) 756-1419

To learn more about the California Collaborative Fisheries Research Program, visit:
http://seagrant.mlml.calstate.edu/research/ccfrp/
or
http://www.slosea.org/collaborative/

CA Collaborative Fisheries Research Program
Thank you for reporting your tagged fish!

Copper Rockfish

Maximum Length: 67 cm (26.4 in); females get larger than males
Lifespan: 50 years
Range: Gulf of Alaska (USA) to Islas San Benito, Baja California (MX)
Life History: A.K.A. "whitebelly" and "chucklehead"; young fish settle around algae and move to the bottom as they grow. Subadults and adults can be found on boulder fields or other rocky habitats, in aggregations or as solitary individuals. Copper Rockfish are relatively sedentary, remaining at a particular rocky outcrop for extended periods of time.

Your fish was tagged and released near Point Lobos State Marine Reserve, spent 846 days at liberty, and moved approximately 0.18 miles (net distance traveled).

Uses of CCFRP Data

More tag returns from anglers outside CCFRP than within the project!
Two Brown Rockfish were tagged on 7/19/17 at Año Nuevo. The first, caught by Nick I., was 43cm (17in). The second, caught by Ed M. was 39cm (15in). Both were caught again on the same day, 9/12/17, the first by Mike J., and the second by Harry L..
Amazing recapture from **Bodega Bay**! They recaptured a Copper Rockfish at Stewart’s Point that was originally tagged by **Cal Poly** in the Piedras Blancas MPA on 8/20/13! In its 1,500 days (4+ years) at liberty, it swam ~220 miles and grew 13 cm!
Tag Returns Highlights From 2017!

One unlucky male Lingcod was caught twice on the same day, 9/19/17, at Point Lobos! Ben R. caught it the first time and Nick I. the second. It was 58 cm (23in).

Lester Y. caught the same 38 cm (15in) Brown Rockfish on 9/28/16 and 7/19/17 at Año Nuevo!
Volunteer Angler Newsletter

• Make important announcements

• Results primarily from the recent season

• Some highlights of the recent season

Greetings MLML CCFRP Volunteers,

With your help, MLML has successfully completed ELEVEN years of data collection inside and outside MPAs of the central California coast! In this time, we’ve conducted a total of 186 hook-and-line surveys in an effort to gather information regarding species compositions, lengths, and catch rates of rockfishes and other species commonly found in the nearshore environment. From these surveys, 556 volunteer anglers have spent 5,465 hours catching 58,043 (and tagging 20,074 fishes) from a total of 51 different species! In addition to the Point Lobos and Ano Nuevo MPAs, MLML added the SE Farallon Islands MPA to our sampling locations this season. This year we were also able to expand the program statewide to sample include 14 MPAs along the California coast with the cooperation of 5 other academic institutions! Thank you to everyone involved in this effort!

At this time, we would like to invite you to our annual volunteer angler appreciation event and data workshop. This is an excellent opportunity to hear about the data we have collected over the past eleven seasons. We would appreciate your attendance and involvement. The event will be held on Sunday, March 4, 2018, from 12-3PM at Moss Landing Marine Laboratories.

If you are able to attend, feel free to bring others who might be interested and please RSVP through email (CCFRP@mlm.calstate.edu) so we may plan accordingly. Lunch will be provided at the meeting. An additional message will be sent out soon with more workshop details. Please stay tuned for updates through email, our website, Facebook, Instagram and YouTube! To review some of the data analyses conducted so far, visit our webpage at: https://www.mlml.calstate.edu/fisheries/ccfrp-datareporst/.

A big thanks to our program partners and research affiliates this season: The Ocean Protection Council, NOAA, FishWise, Santa Monica Seafood, California Department of Fish and Wildlife, F/V Chubasco, F/V Huil Cat, F/V Kahuna, F/V Tigerfish, Humboldt State University, Bodega Marine Laboratories, Cal Poly San Luis Obispo, UC Santa Barbara, and Scripps Institution of Oceanography.
Volunteer Angler Workshop

This is a fun and educational meeting for all involved in CCFRP, which includes:
- Buffet style spread of food
- Highlights from the season
- CCFRP totals and records
- Lots of photos!
The California Collaborative Fisheries Research Program is a collaborative effort among researchers from Moss Landing Marine Laboratories, Cal Poly San Luis Obispo, Humboldt State University, Bodega Marine Laboratory, UC Santa Barbara, and Scripps Institution of Oceanography. MLML would like to thank the volunteer anglers, science crews, and captains and crews of F/Vs Caroline, Chubasco, Huli Cat, Kahuna, New Captain Pete, Queen of Hearts, and Tigerfish for their continued support.

For more information, like us on Facebook and Instagram, or visit us at https://www.mlml.calstate.edu/ccfrp/