

STAFF SUMMARY FOR DECEMBER 14-15, 2022

6. MARINE PROTECTED AREAS MANAGEMENT PROGRAM**Today's Item****Information** **Action**

Receive annual update from DFW on the State's Marine Protected Areas (MPA) Management Program activities.

Summary of Previous/Future Actions

- | | |
|---|---|
| • Final MPA master plan adopted | Aug 24-25, 2016; Sacramento |
| • Most recent annual update on MPA Management Program activities | Dec 15-16, 2021; Webinar/Teleconference |
| • Today receive annual update on Management Program activities | Dec 14-15, 2022; San Diego |

Background

In 2016, FGC adopted the master plan for MPAs, which formally established DFW's MPA Management Program. As the primary managing agency for the state's MPAs, DFW manages California's MPAs as a statewide network within a collaborative, partnership-based approach.

DFW's MPA Management Program has four components: (1) outreach and education, (2) research and monitoring, (3) enforcement and compliance, and (4) policy and permitting. DFW's overall approach is essential to inform adaptive management of the MPA network and to help meet the goals of the Marine Life Protection Act. When it adopted the master plan for MPAs, FGC requested that DFW provide an annual report of program activities.

For 2022, DFW has provided a memo detailing actions in the past year for each of the four components (Exhibit 1). The management program made significant advances in 2022, including near-completion of the network's first decadal management review. At today's meeting, DFW will highlight 2022 management activities and significant events, and highlight the upcoming decadal management review, describing sources of data for MPA network performance evaluation, tribal engagement efforts, and the anticipated timeline for release of DFW's decadal management review report and public discussions with MRC and FGC (Exhibit 2).

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

1. [DFW memo, received Dec 1, 2022](#)
2. [DFW presentation](#)

Motion (N/A)

Memorandum

Date: November 29, 2022

Received 12/1/2022;
signed copy on file

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: Marine Protected Areas Management Program Updates for 2022

I. Overview

In 2016, the California Fish and Game Commission (FGC) requested the California Department of Fish and Wildlife (CDFW) prepare annual updates about the management of California's marine protected area (MPA) Network. These annual updates are centered around the MPA Management Program ([Management Program](#)), which CDFW uses to manage the MPA Network through a collaborative partnership-based approach. The Management Program is supported by four pillars: 1) outreach and education, 2) research and monitoring, 3) enforcement and compliance, and 4) policy and permitting. In addition to regular work relating to the four pillars, CDFW spent concerted time and focus this year developing the first Decadal Management Review (Review) of the Management Program. This memo provides an overview of the 2022 Management Program activities, as well as information about the Review.

II. MPA Management Program 2022

While much of CDFW staff effort focused on development of the Review throughout 2022, the following summarizes ongoing work within the four pillars of the Management Program not directly related to the Review.

(a) Outreach and Education

Efforts continue to focus on increasing public awareness of the MPA Network to improve understanding of the Management Program and compliance with MPA regulations. CDFW and partners have emphasized the development of online resources such as blogs, articles, and videos while printed materials like brochures and posters have become less of a priority but are still made available at in-person outreach events. Notable outreach and education accomplishments from 2022 include:

- CDFW [authored a manuscript](#) published in the journal *Marine Policy* detailing lessons learned and management recommendations gleaned from planning for and managing the Network since 2004.
- CDFW had the [MPA brochures](#) translated from English into Spanish and has plans to release translations of the brochures into Vietnamese, Chinese (traditional and simplified), and Tagalog over the next year.
- Ocean Protection Council (OPC) approved approximately [\\$4.2 million from Once-Through-Cooling funds](#) for disbursement to the Department of Parks and Recreation (DPR) and Resources Legacy Fund (RLF) for continued support of MPA partnerships for Outreach, Education, Enforcement, and Compliance projects.
 - DPR will match the OPC approved funds with about \$350,000 to expand existing MPA outreach and education initiatives within DPR. Funding will be used to support staff, train volunteers, and extend the reach of educational programs (like [Parks Online Resources for Teachers and Students](#)) by utilizing video footage and new technologies.
 - RLF will match the OPC approved funds with about \$1.4 million to support continued trainings and production of resources to improve enforcement and compliance for the MPA Network.
- The California Marine Sanctuary Foundation (CMSF) and the MPA Collaborative Network continue to work on improving MPA signage statewide made possible by \$500,000 in [Once-Through-Cooling Interim Mitigation](#) funds approved by OPC in 2021.
 - During the summer of 2022, CMSF evaluated existing MPA signage (including harbor signs, interpretive signs, tidepool signs, “You Are Here” and no fishing/no collecting signs and all associated signage elements) to determine overall effectiveness in increasing awareness of MPA rules and boundaries. Nearly 3000 coastal visitors were observed and over 800 surveys were administered from San Diego to Del Norte counties. Data entry and analysis are currently underway, with outcomes informing the development of new signage anticipated for 2023.
 - The MPA Collaborative Network, in partnership with CMSF, is developing a new approach to inventory and track MPA signage across the state using geographic information system technology that will allow for signage data to be crowdsourced by collaborative members. Over

765 inventory surveys have been completed to ground truth previous sign installation records and catalog signs installed in 2022.

- An [overview video of California's Network of MPAs and enforcement efforts](#) for judges, district attorneys, and enforcement officers, was created in 2022 by RLF and the MPA Collaborative Network in partnership with CDFW's Law Enforcement Division, through Once-Through-Cooling Interim Mitigation funds approved by OPC in 2019.
- Following nearly two years of primarily remote, physically distanced work and meetings due to the COVID-19 pandemic, CDFW and partners began to return to in person events. In 2022, CDFW:
 - Participated in multiple MPA Collaborative meetings and events such as a subsistence fishing event hosted by the Santa Barbara Channel MPA Collaborative at the Goleta Pier in Santa Barbara County, and the Coastal Marine Research Symposium sponsored by the Orange County MPA Collaborative.
 - Provided an informal presentation with a question-and-answer session at the Environmental Action Committee of West Marin's MPA open house at Point Reyes Station.
 - Presented information about the Management Program at Beyond the Golden Gate Symposium, the 2022 Scuba Show Convention in Long Beach, and Sanctuary Fest – Monterey Bay National Marine Sanctuary's 30th anniversary event in Santa Cruz.
 - Hosted Special Topic Session: MPA Network Science and Management at the Western Society of Naturalist's 103rd annual meeting.

(b) Research and Monitoring

The [MPA Monitoring Program](#) guides research and monitoring activities across California's MPA Network. The Monitoring Program employs a two-phase, ecosystem-based approach to monitoring and combines multiple sources of information to guide the state's adaptive management process.

Phase 1: Regional Baseline Monitoring, 2007 to 2018

Baseline monitoring established a comprehensive benchmark of ecological and socioeconomic conditions at or near the time of regional MPA implementation and serves as an important set of data against which future conditions can be measured. Products are available on the [CDFW's MPA Monitoring page](#).

Phase 2: Statewide Long-term Monitoring, 2018 to present

Following the guidance outlined in the 2018 [MPA Monitoring Action Plan](#), eight long-term monitoring projects collected two years (2019 and 2020) of ecological and human use data. Each project submitted a technical report to aid in the evaluation of the MPA Network in meeting the goals of the MLPA. These [long-term monitoring technical reports](#) became publicly available in January 2022. Results from these projects helped inform the development of the Review. To avoid gaps in data collection, ecological monitoring in key habitats continued throughout 2021 and 2022.

In October, OPC approved funding of [\\$4.5 million to continue ecological monitoring](#) in 2023. Four key habitats (rocky intertidal, kelp forest/shallow rocky reef, deep rocky reef, and sandy beach/surf zone), as well as a collaborative fisheries research program were funded. This funding helps ensure continued data collection to minimize gaps in the long-term monitoring datasets.

In addition, OPC approved funding to expand upon an existing coastwide [connectivity population model](#), and to expand the [Tribal Marine Stewards Network Program](#) by adding a fifth partner tribe, the Santa Ynez Band of Chumash Indians, and to ensure monitoring and community engagement work will continue for the next three years (2023-2025).

(c) Enforcement and Compliance

CDFW's Law Enforcement Division (LED) continued to coordinate with the MPA Collaborative Network to support enforcement trainings for allied agency officers (i.e., State Parks officials, lifeguards, county enforcement). A total of seven regional trainings were completed. These trainings are designed to help allied agency officers learn the history, locations, and regulations of their local MPAs and to facilitate CDFW's capacity to communicate and enforce MPA regulations.

As part of the preparation for the Review, CDFW staff meticulously entered hard copy citation information for marine resource violations that occurred from 2015-2021. More than 14,700 citations and 17,900 violations were entered between 2021-2022. This data entry adds to citation entries previously done in preparation for [State of the Region reports](#).

The database that contains historical hardcopy MPA citation information complements LED's 2019 Records Management System (RMS). Since the implementation of the RMS in 2019, enforcement staff have been able to make queries of MPA citation data. In coordination with LED, MPA Management staff identified areas for improving the data structure within RMS. The improvements have increased LED's ability to effectively query trends in MPA violations.

(d) Policy and Permitting

Scientific Collecting Permits

From January to November 15, 2022, a total of 47 scientific collecting permits (SCPs) were issued for research and education within 76 unique MPAs, including 32 state marine reserves (SMRs), 33 state marine conservation areas (SMCAs), seven no-take state marine conservation areas, and four state marine recreational management areas (SMRMAs).

Since implementation of the MPA Network, a total of 909 SCPs have been issued for research and education activities within MPAs. Regionally, the MPAs with the most SCP activities are Crystal Cove SMCA –173 projects (south), Carmel Bay SMCA – 129 projects (central), and Bodega Head SMR – 81 projects (north).

Regulatory packages

- In 2015, a regulatory amendment intended to clarify some MPA regulations unintentionally removed the allowed and prohibited uses within five SMRMAs. Amendments to correct the [SMRMA regulations](#) were adopted by the FGC in June 2022 with an effective date of August 19, 2022.
- During regional implementation of the MPA Network, 2007-2012, certain artificial structures such as piers, docks, cables, intake and outflow pipes, and seawalls, existed where some of the newly designated MPAs are located. While normal operation of most of these structures may not result in take of marine species, maintenance, repair, or replacement could result in incidental take. Beginning in 2021 and throughout 2022, CDFW, developed draft regulations with input from a working group of the Statewide MPA Leadership Team to address maintenance and repair for those pre-existing structures. A contractor was hired to prepare a supplemental CEQA document for the proposed regulation amendments, the formal regulatory process is anticipated to begin in spring 2023.

III. Decadal Management Review

Throughout 2022, CDFW was largely focused on preparation for the first 10-year Review of the Management Program and performance of the Network. The Review focuses on each of the four pillars of the Management Program and evaluates the progress of the MPA Network towards meeting the [Marine Life Protection Act](#) (MLPA) goals.

(a) Science and Management Data Informing the Review

CDFW used multiple sources of information about the MPA Network, including scientific assessments of ecological and socioeconomic data, enforcement data, and scientific collecting permit information to inform the science of the Review.

Specific resources include:

- [Baseline reports](#) and [long-term monitoring reports](#).
- Two working group reports - [Science Guidance for Evaluating California's MPA Network](#) and [Climate Resilience and California's MPA Network](#).

In addition to these already available resources, throughout 2022, the [National Center for Ecological Analysis and Synthesis](#) (NCEAS) worked on an integrative analysis of MPA ecological monitoring, enforcement, and human dimensions data sources across the state. NCEAS used these existing data streams to address many of the Network-level evaluation questions outlined in Appendix B of the [MPA Monitoring Action Plan](#) and Science Guidance for Evaluating California's MPA Network report. Highlighted results produced by NCEAS will be featured in the Review report. NCEAS will also release a separate, more comprehensive technical report containing their detailed results.

(b) Communicating about the Review

OPC, in coordination with CDFW, hired two contractors who were tasked with raising awareness of the Management Program through effective branding and engaging with stakeholders leading up to the Review.

- Received in September 2022, CDFW now has a collection of design templates to use to help create cohesive and consistent documents and presentations when referencing MPA Network. Inspired by the existing four-wave MPA logo, these templates will be used for both digital and printed products to raise awareness of and create brand identity for the Management Program. When released, the Review report will showcase this newly developed brand design.
- Feedback from a series of [community engagement meetings](#) held in 2021 indicated the public who attended wanted more information regarding the long-term monitoring projects informing the Review ([archived video recordings](#)). In response to this feedback, OPC, in partnership with CDFW, hosted an eight-part virtual webinar series titled "[Ask the Researcher](#)" throughout the summer of 2022. These meetings and associated snapshot reports allowed webinar attendees to engage directly with the researchers about the science informing the management of the MPA Network ([archived webinar recordings](#)).

In addition to this contracted work, CDFW used multiple other outlets to make information available to the public, including:

- Creating a specific email address mpamanagementreview@wildlife.ca.gov and [contact form](#) to respond to questions and suggestions from the public about the Review,
- Including information about the Review in multiple blogs posted via [Marine Management News](#),
- Creating a [Review specific webpage](#) to communicate all information about events, resources, and responses to frequently asked questions,
- Presenting updates during FGC meetings, MPA Collaborative Network meetings, and other outreach events, and
- Using the [Outreach and Engagement Stakeholder Steering Committee](#) (Steering Committee) to help disseminate information about the Review with their existing networks and communities when needed.

(c) Tribal Engagement

CDFW actively engaged with tribes during the development of the Review. Starting with a letter sent to all California Native American Tribes in early 2021 informing them of the Review, two follow-up email announcements about the Review were sent to all California Native American Tribes in 2022. These correspondences focused on providing updates about the Review process and providing space for discussions, meetings, or consultations with tribes if desired. Updates were also provided this year during the [Environmental Protection Agency's Regional Tribal Operations Committee in January](#) and [FGC's Tribal Committee meeting in April](#). In addition, a virtual round table gathering occurred with California Native American Tribes May 9, 2022, to have a conversation about the 2022 the Review. Participants were invited to share their priorities and perspectives about MPA management in California.

A Tribal Steering Committee, consisting of tribal members, was established to provide outreach and engage with tribes during the Review process. Members of the Tribal Steering Committee worked with tribes to produce the *Tribal Summary to Inform the State of California Marine Protected Area Decadal Management Review*, which specifically informed tribal sections of the Review and will be available in its entirety as an appendix to the Review report. In addition, all California Native American Tribes were also invited to review the report and provide any comments prior to its finalization.

(d) Partner Engagement

To ensure an inclusive and comprehensive Review, CDFW invited agencies, tribes, and partners to submit a report highlighting their contributions to the Management Program since Network completion for inclusion in the Review. Twenty-two individual reports were received to inform the development of the Review and will be available in their entirety as an appendix to the Review. These reports provided partners with an opportunity to share their program's unique achievements, challenges, and recommendations in support of the Management Program pillars, and how their work relates to the goals of the MLPA.

IV. Emerging Management Issues

In October 2020, Governor Newsom launched an effort to protect California's biodiversity and build climate resilience by establishing a state goal of conserving at least 30 percent of California's land and 30 percent of coastal waters by 2030 ([Order N-82-20](#)). While the MPA Network is a fundamental component to meet California's 30 x 30 goals, the Executive Order's commitment to reaching 30 percent of coastal marine conservation is also based on advancing measures beyond the MPAs, such as enhancing biodiversity safeguards in National Marine Sanctuaries, National Estuary Programs, and Areas of Special Biological Significance. The first 10-year review of the MPA Network and Management Program will focus on recommendation to support meeting the MLPA goals, not the state's 30 x 30 marine conservation goals.

V. Looking Forward

Throughout 2022, CDFW and its partners focused on preparation for the first Review of the Management Program. The report is anticipated for public review in January 2023 and delivery to the FGC for their February 2023 meeting. A public symposium will be held March 15 to highlight the collaborative work that informed the Review, followed by a Marine Resources Committee (MRC) meeting March 16; both the symposium and MRC meeting will take place in Monterey. The MRC meeting is anticipated to include a discussion of the findings and adaptive management recommendations within the Review. The full FGC will then discuss the Review findings, adaptive management recommendations, and possible changes to the MPA Management Program and/or the MPA Network at their April and subsequent meetings in 2023.

If you have any questions or need more information, please contact Dr. Craig Shuman, Marine Regional Manager, at (805) 568-1246.

Attachment: Marine Protected Areas Management Program Updates for 2022 Memo
hyperlinks in sequential order

Melissa Miller-Henson, Executive Director
Fish and Game Commission
November 29, 2022
Page 9

ec: Jenn Eckerle, Acting Deputy Secretary for Ocean and Coastal Policy
Natural Resources Agency

Craig Shuman, D. Env., Region Manager
Marine Region

David Bess, Chief
Law Enforcement Division

Eric Kord, Assistant Chief
Law Enforcement Division

Becky Ota, Environmental Program Manager
Marine Region

Stephen Wertz, Senior Environmental Scientist
Marine Region

Attachment 1. *MPA Management Program Updates 2022 Memo, hyperlinks.*

Attachment 1. Marine Protected Areas Management Program Updates for 2022 Memo hyperlinks in sequential order.

1. Page 1

- a. Management Program:
<https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Management>

2. Page 2

- a. Published a manuscript:
https://www.sciencedirect.com/science/article/pii/S0308597X2100539X?casa_token=CjmF3AI0qdAAAAAA:ycsOqf4fvpee1Jjd_18qBjZ5c8NCAbhoHFnes8IS_pfpTp40AjQn1EOdJgtH6QZtmh1COCfiGFE
- b. MPA brochures: <https://wildlife.ca.gov/Conservation/Marine/MPAs/Outreach-Materials#26716426-mpa-brochures>
- c. \$4.2 million from Once-Through-Cooling funds:
https://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20221006/Item-7a-MPA-OE-and-Compliance-508.pdf
- d. Parks Online Resources for Teachers and Students: <https://www.ports-ca.us/home/mpas>

3. Page 3

- a. Overview video of California's Network of MPAs and enforcement efforts:
<https://www.youtube.com/watch?v=rrfPLmtEk3o>
- b. MPA Monitoring Program:
<https://wildlife.ca.gov/Conservation/Marine/MPAs/management/monitoring>

4. Page 4

- a. CDFW's MPA Monitoring page:
<https://www.wildlife.ca.gov/Conservation/Marine/MPAs/management/monitoring#537132130-baseline-monitoring-reports-by-region>
- b. MPA Monitoring Action Plan:
<https://wildlife.ca.gov/Conservation/Marine/MPAs/Management/Monitoring/Action-Plan>
- c. Long-term monitoring technical reports: <https://caseagrants.ucsd.edu/news/california-marine-protected-area-long-term-monitoring-program-final-reports-2019-2021>
- d. \$4.5 million to continue ecological monitoring:
https://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20221006/Item-7b-MPA-Monitoring-508.pdf

Attachment 1. MPA Management Program Updates 2022 Memo, hyperlinks.

- e. Connectivity population model:
https://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20221006/Item-9-Connectivity-508.pdf
 - f. Tribal Marine Stewards Network Program:
https://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20221006/Item-5-TMSN-508.pdf
 - g. State of the Region reports:
<https://wildlife.ca.gov/Conservation/Marine/MPAs/management/monitoring#537133255-state-of-the-region-reports-by-region>
5. Page 5
- a. SMRMA regulations: <https://fgc.ca.gov/Regulations/2022-New-and-Proposed#SMRMA>
 - b. Marine Life Protection Act: <https://wildlife.ca.gov/Conservation/Marine/MPAs/MLPA>
6. Page 6
- a. Baseline reports:
<https://wildlife.ca.gov/Conservation/Marine/MPAs/Management/monitoring#topofpane>
 - b. Long-term monitoring reports:
<https://wildlife.ca.gov/Conservation/Marine/MPAs/management/monitoring#topoflmppane>
 - c. Science Guidance for Evaluating California's MPA Network:
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=198644&inline>
 - d. Climate Resilience and California's MPA Network:
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=198646&inline>
 - e. National Center for Ecological Analysis and Synthesis: <https://www.nceas.ucsb.edu/>
 - f. MPA Monitoring Action Plan:
<https://wildlife.ca.gov/Conservation/Marine/MPAs/Management/Monitoring/Action-Plan>
 - g. Community engagement meetings:
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=197069&inline>
 - h. Archived video recordings: <https://www.youtube.com/playlist?list=PL-PEXRYYP1QS9F8EGp5x92GgV6XS-LP7>
 - i. Ask the Researcher: <https://www.opc.ca.gov/2022/05/mpa-monitoring-series-ask-the-researcher/>
7. Page 7
- a. Archived webinar recordings:
<https://www.youtube.com/playlist?list=PLTFHbsQ8LvIXCJQC5gUX9owDRTr7Z1WiE>
 - b. Contact form: <https://wildlife.ca.gov/Conservation/Marine/MPAs/Contact/Decadal-Management-Review>

Attachment 1. *MPA Management Program Updates 2022 Memo, hyperlinks.*

- c. Marine Management News: <https://cdfwmarine.wordpress.com/>
 - d. Review specific webpage: <https://wildlife.ca.gov/Conservation/Marine/MPAs/Management/Decadal-Review>
 - e. Outreach and Engagement Stakeholder Steering Committee: <https://wildlife.ca.gov/Conservation/Marine/MPAs/Management/Decadal-Review#568183257-what-is-the-review-steering-committee>
 - f. Environmental Protection Agency's Regional Tribal Operations Committee in January: <https://www.epa.gov/system/files/documents/2022-02/winter-rtoc-2022-presentation-ocean-protection-council.pdf>
 - g. FGC's Tribal Committee meeting in April: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=202268&inline>
8. Page 8
- a. Order N-82-20: <https://www.adaptationclearinghouse.org/resources/california-executive-order-n-82-20-addressing-the-biodiversity-crisis.html>



Marine Protected Areas Annual Update: 2022

14 December 2022

Presented to:

Fish and Game Commission
Virtual Webinar

Presented by:

Amanda Van Diggelen
Environmental Scientist
Marine Region



MPA Management Program Pillars



Outreach and Education

Photo: MPA Collaborative Network



Research and Monitoring

Photo: CDFW, A. Van Diggelen



Enforcement and Compliance

Photo: CDFW, A. Van Diggelen



Policy and Permitting

Photo: Jeff Landesman



Outreach and Education

Marine Policy 137 (2022) 104908
 Contents lists available at ScienceDirect
 Marine Policy
 journal homepage: www.elsevier.com/locate/marpol

California's lessons learned and recommendations for effective marine protected area network management

Amanda D. Van Diggelen^{a,*}, Sara E. Worden^b, Adam J. Fridmodig^c, Stephen P. Wertz^d

^aCalifornia Department of Fish and Wildlife, 4001 Central Expressway, San Francisco, CA 94134, USA
^bCalifornia Department of Fish and Wildlife, Marine Region, 1123 Industrial Road Suite 406, San Carlos, CA 95050, USA
^cCalifornia Department of Fish and Wildlife, Marine Region, 437 3rd Street, San Francisco, CA 94103, USA
^dCalifornia Department of Fish and Wildlife, Marine Region, 437 3rd Street, San Francisco, CA 94103, USA

ARTICLE INFO

Keywords:
 Marine protected area
 Adaptive management
 Resilience
 Resilient coastal network
 Lessons learned
 Management recommendations

ABSTRACT
 Establishment of marine protected areas (MPAs) and MPA networks has increased globally following the passage of the Convention on Biological Diversity's Strategic Plan for Biodiversity to 2030. Known as the Aichi Target 11, this plan calls for the protection of 10% of coastal and marine ecosystems by 2020. Despite an increase of global efforts to implement MPAs, and more recently MPA networks, to achieve the Aichi Target 11, there is limited peer-reviewed literature about lessons learned and insights for effective implementation and management. MPA California has been one of the largest, scientifically guided, stakeholder-driven, ecologically connected networks of MPAs in the world. This paper offers guidance to MPA managers and policy makers on points of consideration prior to, during, and following, MPA implementation. Topics and recommendations are based on lessons learned from the design and implementation of California's MPA Management Program. Recommendations range from the importance of using science to guide MPA planning and implementation, flexibility to accommodate resources and scientific monitoring, as well as addressing overlapping governance and activities, and early and sustained public outreach and engagement. Finally, establishing an adaptive management process to provide a responsive framework for potential management change including a combination for tracking the efficacy of a network of MPAs following establishment is critical. While implementation of California's MPA network continues to evolve, these insights can inform other MPA network planning and management efforts.

1. Introduction
 Marine protected areas (MPAs) are the subject of increasing policy attention as a tool for preserving ecosystems and the services they provide. However, this tends to focus on individual MPAs with MPA networks still understudied despite their efficiency in adding up the value of individual MPAs [1]. On a global scale, one of the key conditions of the Convention on Biological Diversity's Strategic Plan for Biodiversity in 2010 (Aichi Target 11) is that protected areas be well-connected to the wider landscape through representation and replication of key habitats and the application of an ecosystem management approach. Additionally, the new Global Biodiversity Framework under consideration by the United Nations Convention on Biological Diversity has called for at least 30% coverage of protected areas (terrestrial and marine) by 2030 [2]. In response, many countries have or are considering setting conservation goals as a key means of protecting a broader range of marine habitats and ecosystems [3–5].

In California, recognizing the importance of marine resources to public health, well-being, and the coastal economy, the state has taken a proactive approach to managing marine resources for long-term sustainability. In 1999 and 2000 the Marine Life Protection Act (MLPA) [6] and the Marine Managed Areas Improvement Act (MMIA) [7] were signed into law, respectively, and helped pave the way for shifting marine resource management from a single-issue approach to an ecosystem-based approach [8].

In December 2012, amidst political, financial, and logistical challenges, California became the first state in the United States to implement a science-guided, stakeholder-driven, ecologically connected network of 124 MPAs (Fig. 1) [9–11]. This network spans California's roughly 1100-mile coastline, including offshore islands, and encompasses around 640 square nautical miles (one of the approximately 2000 square nautical miles of state ocean waters (0–3 nautical miles from

* Corresponding to 4000 Lompoc Ave, Suite C, Los Alamitos, CA 90720, USA.
 E-mail address: Amanda.VanDiggelen@dfw.ca.gov (A.D. Van Diggelen).

<https://doi.org/10.1016/j.marpol.2021.104908>
 Received 22 March 2021; Received in revised form 13 November 2021; Accepted 16 December 2021
 Available online 7 January 2022
 0898-5073/© Published by Elsevier Ltd.



Photo: S. Wertz



Photo: MPA Collaborative Network



Photo: S. Worden



Research and Monitoring

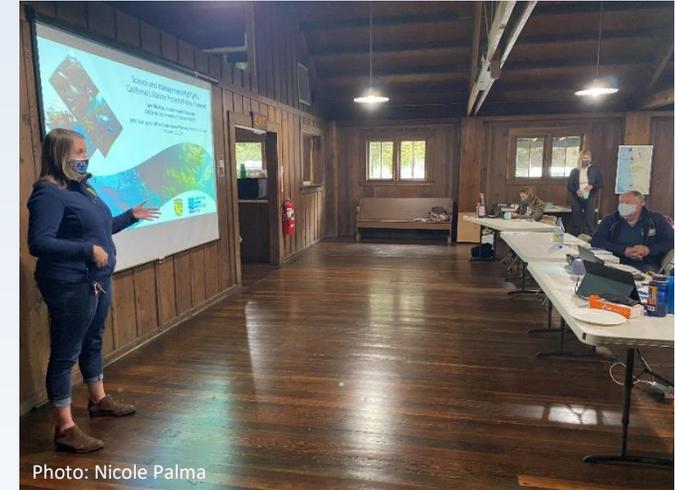
- Habitat Monitoring
 - Sandy beach
 - Rocky intertidal
 - Kelp forests
 - Deep rocky reefs
- Tribal Marine Stewards Network
- Network Connectivity Modeling





Enforcement and Compliance

- MPA Citation Data Entry, 2016-2021
 - 14,700 citations and 17,900 violations entered
- Allied Agencies Enforcement Workshops, 2022
 - 7 workshops
- Records Management System Improvements





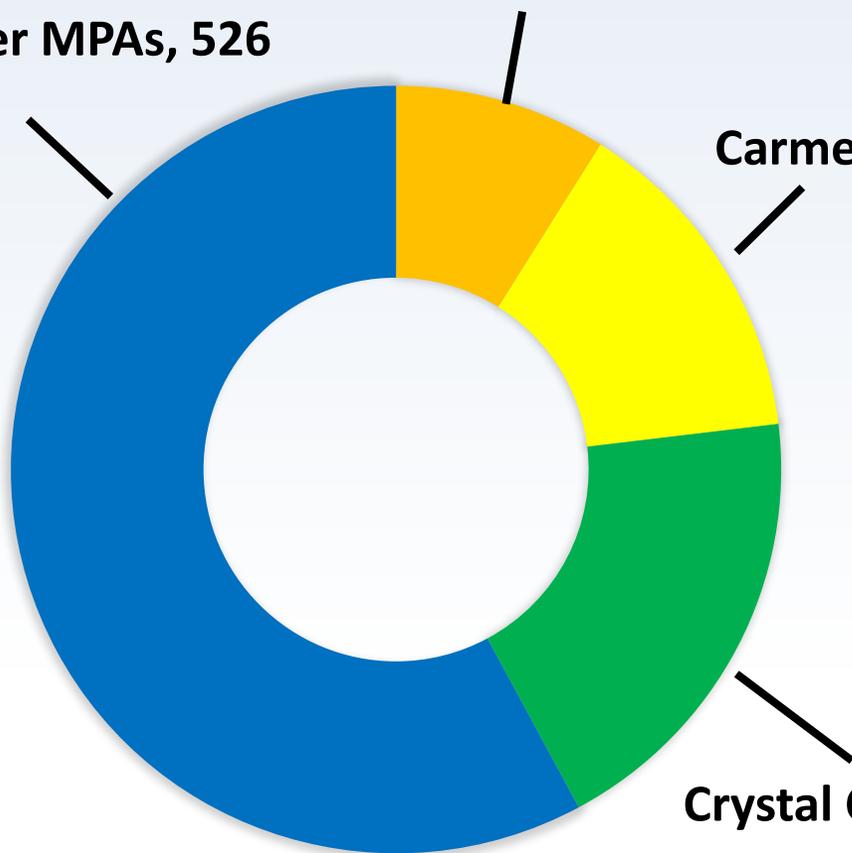
Policy and Permitting

909 MPA SCPs ISSUED, 2012-2022*

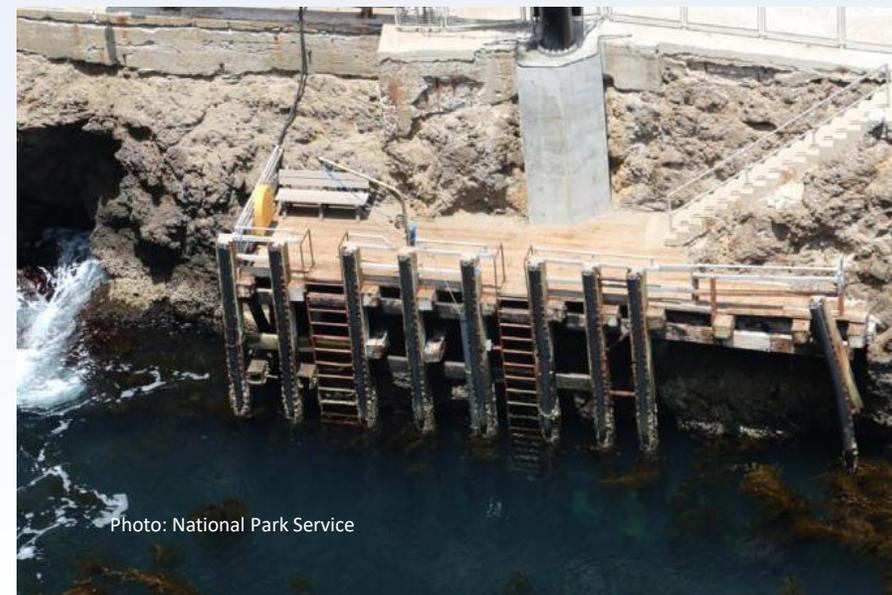
Bodega Head SMR, 81

Other MPAs, 526

Carmel Bay SMCA, 129



Crystal Cove SMCA, 173

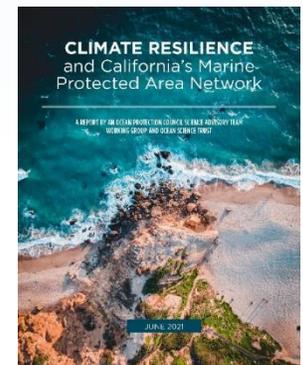
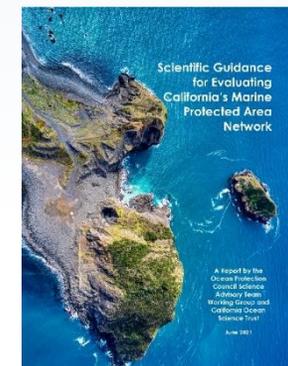
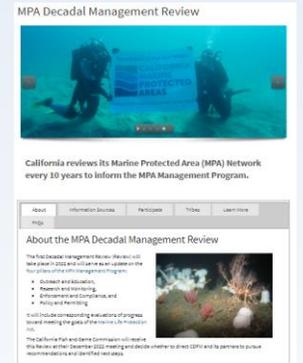


**2022 data through November 15, 2022*



MPA Network Performance Sources

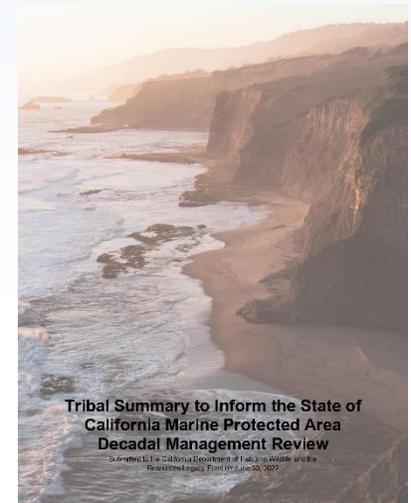
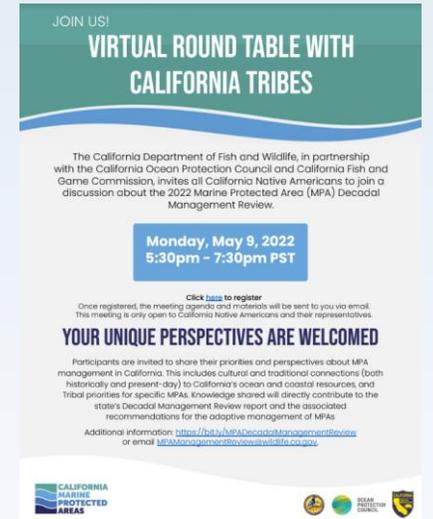
- Law enforcement data
- MPA Management Program partner reports
- Input from stakeholder engagement
- Science guidance
 - Monitoring reports
 - MPA Decadal Evaluation Working Group Report
 - MPAs and Climate Resilience Report
 - National Center for Ecological Analysis and Synthesis
- Recommendations and associated action items





Decadal Management Review: Tribal Engagement

- Notification letter and emails about Review sent to all California Native American Tribes
- Environmental Protection Agency's Regional Tribal Operations Committee
- Review updates for the Fish and Game Commission
 - Tribal Committee
 - Marine Resources Committee
- Review Tribal Steering Committee produced: *Tribal Summary to Inform the California's MPA Network Decadal Management Review*





Decadal Management Review: Anticipated Timeline

2023

- **January:** Report publicly available
- **February:** Report received at Commission meeting
- **March:** Forum and Marine Resource Committee (MRC) Meeting
 - Dates: Forum, March 15 & MRC, March 16
 - Location: Monterey Fair Grounds
- **April:** Report discussion continued at Commission meeting

Thank You Questions?

Amanda Van Diggelen, Environmental Scientist

MPA Management Project Staff:

- Program Manager, Becky Ota
- Senior Environmental Scientist Supervisor, Stephen Wertz
- Environmental Scientists: Michael Prall, Sara Worden, Chenchen Shen, Lara Slatoff, Kara Gonzales, Amanda Van Diggelen
- Associate Governmental Program Analyst: Tamara Heitzenrater