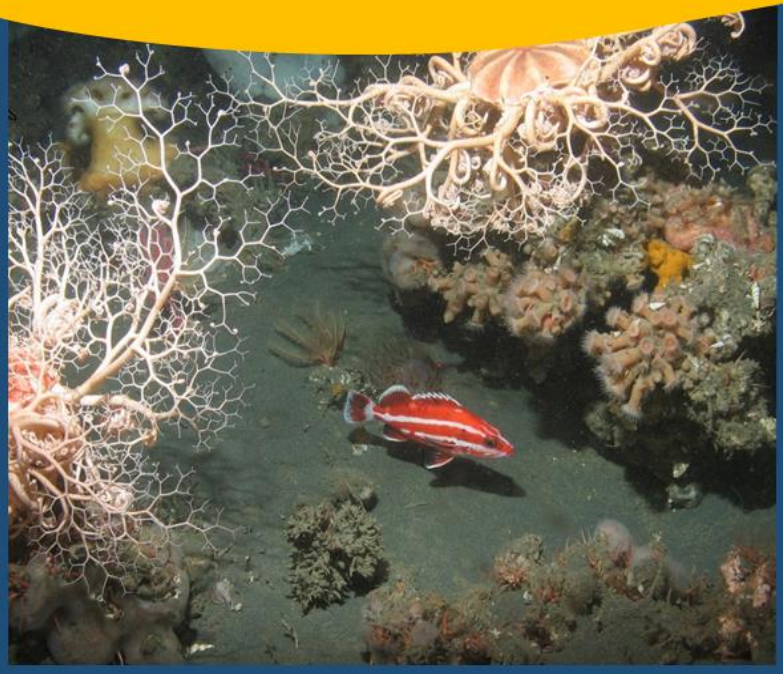
CALIFORNIA MARINE LIFE PROTECTION ACT

Master Plan for Marine Protected Areas

FINAL August 2016

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE



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Top left (North Coast): Image of a juvenile yelloweye rockfish, basket stars, and other species in Mattole Canyon State Marine Reserve, taken by California Department of Fish and Wildlife / Marine Applied Research & Exploration

Top right (North Central Coast): Image of the coastline in Stewarts Point State Marine Conservation Area, taken by Brian Owens, California Department of Fish and Wildlife

Bottom left (Central Coast): Image of elephant seals in Piedras Blancas State Marine Reserve, taken by Michelle Horeczko, California Department of Fish and Wildlife

Bottom right (South Coast): Image of a giant kelp forest in Laguna Beach State Marine Reserve, taken by Cameron Wertz

Acknowledgements

On August 24, 2016, the California Fish and Game Commission (Commission) adopted the final California Marine Life Protection Act Master Plan for Marine Protected Areas (2016 Master Plan). The 2016 Master Plan was developed by the California Department of Fish and Wildlife (CDFW), in close collaboration with the Commission, California Ocean Protection Council, and California Ocean Science Trust, and with assistance from Blue Earth Consultants, LLC. Insightful input was also received from other state and federal agencies, California Tribes and Tribal governments, non-governmental organizations, academic institutions, many other organizations, and the general public.

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Acronyms

Acronym	Definition
ARMP	Abalone Recovery and Management Plan
BRTF	Blue Ribbon Task Force
CASG	California Sea Grant
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CINMS	Channel Islands National Marine Sanctuary
CNRA	California Natural Resources Agency
Commission	California Fish and Game Commission
COPA	California Ocean Protection Act
FGC	Fish and Game Code
FMP	Fishery Management Plan
MLMA	Marine Life Management Act
MLPA	Marine Life Protection Act
MLPA Initiative	California Marine Life Protection Act Initiative
MLPP	Marine Life Protection Program
MMA	Marine Managed Area
MMAIA	Marine Managed Areas Improvement Act
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MSLT	MPA Statewide Leadership Team
NFMP	Nearshore Fishery Management Plan
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NRDC	Natural Resources Defense Council
OPC	California Ocean Protection Council
OST	California Ocean Science Trust
PISCO	Partnership for Interdisciplinary Study of Coastal Oceans
RLF	Resources Legacy Fund
SAT	Science Advisory Team
SCC	State Coastal Conservancy
SCP	Scientific Collecting Permit
SLC	State Lands Commission
SMCA	State Marine Conservation Area
SMP	State Marine Park
SMR	State Marine Reserve
SMRMA	State Marine Recreational Management Area
SIG	Statewide Interests Group
SWQPA	State Water Quality Protection Area
SWQPA-GP	State Water Quality Protection Area- General Protection
SWRCB	State Water Resources Control Board
TEK	Traditional Ecological Knowledge
TK	Traditional Knowledge
US	United States

Executive Summary

Purpose and Approach

California's coastal ocean waters are among the most biologically productive in the world, and California's marine resources are vital to the state's coastal economy and provide numerous ecosystem benefits. In response to threats to marine ecosystems from human impacts and natural fluctuations, California has taken a proactive approach by managing marine resources for long-term sustainability. Since the 1990s, California has a history of numerous pieces of legislation, programs, and plans that chart a course for ocean management, including through marine protected areas (MPAs). In 1999, the California Legislature passed the Marine Life Protection Act (MLPA) requiring California to reevaluate all existing MPAs, which were at that time largely ineffective and disconnected, and design new MPAs that together function as an interconnected statewide network. The goals of the MLPA are:

1. Protect the natural diversity and abundance of marine life, and the structure, function and integrity of marine ecosystems.
2. Help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.
3. Improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and manage these uses in a manner consistent with protecting biodiversity.
4. Protect marine natural heritage, including protection of representative and unique marine life habitats in California waters for their intrinsic values.
5. Ensure California's MPAs have clearly defined objectives, effective management measures, and adequate enforcement and are based on sound scientific guidelines.
6. Ensure the state's MPAs are designed and managed, to the extent possible, as a network.

The MLPA required the California Department of Fish and Wildlife (CDFW) to develop, and the California Fish and Game Commission (Commission) to adopt, a master plan that guides the implementation of the Marine Life Protection Program (MLPP) to redesign the state's MPA network. The MLPP includes all state MPA governance and management mechanisms and institutions as well as California's MPA network itself. A master plan framework was developed in 2005, and the Commission formally adopted the draft *California Marine Life Protection Act Master Plan for Marine Protected Areas* in 2008 following the implementation of the Central Coast MPAs. The 2008 Master Plan guided the three following regional siting and design processes, whereas this 2016 Master Plan sets a statewide foundation for MPA management moving forward to meet the goals of the MLPA. The 2016 Master Plan is also complemented by *The California Collaborative Approach: Marine Protected Area Partnership Plan* (the Partnership Plan).

The MPA network depends on the participation and support of numerous entities that provide specialized knowledge, ensure cost-effective management of the MPA network, and ensure participation from a wide array of stakeholders. Partners in MPA management have signed several memoranda of understanding (MOUs) committing to collaborative planning and adaptive management of the MPA network, including an updated 2015 MOU between 15 government and non-governmental entities. The Commission is the primary regulatory decision-making authority for California's MPA network, CDFW is the primary managing agency and implements and enforces regulations set by the Commission and provides scientific expertise, and the California Ocean Protection Council (OPC) is responsible for the direction of policy of the state's MPAs. The MLPP also seeks input from bodies

including California Tribes and Tribal governments, an MPA Statewide Leadership Team (MSLT) that is comprised of agencies and partners that have significant authority related to MPAs or marine sanctuaries, and partners in the California Collaborative Approach – which is documented in the Partnership Plan.

MPA Network Design and Siting Process

The six goals of the MLPA recognize the importance of protecting marine resources for various purposes, and therefore it is important to use multiple types of marine managed areas (MMAs) to achieve these distinct goals. MPAs are a subset of MMAs and include three MPA classifications (State Marine Reserve [SMR], State Marine Conservation Area [SMCA], and State Marine Park [SMP] and one MMA classification (State Marine Recreational Management Area [SMRMA]). Special closures are not MMAs, but also contribute to the goals of the MLPA. Each of these classifications includes varying levels and types of protection such as allowed take, scientific research, and recreational and commercial harvest.

The MLPA Initiative was a science-based and stakeholder-driven MPA planning process that utilized the best readily available science in a comprehensive, highly collaborative, and transparent process to establish MPAs. The MLPA Initiative directed and informed four iterative regional siting and design processes (Central Coast, North Central Coast, South Coast, and North Coast, in chronological order) between 2004 and 2012. Three planning bodies – the Blue Ribbon Task Force (BRTF), Science Advisory Team (SAT), and Stakeholder Advisory Group – supported the design and siting of each region. The overall aim of the process was for the BRTF to select a set of alternative MPA proposals, including a preferred alternative, for each region and for the Commission to adopt one of the alternatives.

Completed in 2012, California's MPA network generally reflects the integration of the science and science-based MPA design guidelines from the MLPA, the 2008 Master Plan, and SAT guidance. For example, compared to California's 63 MPAs in 1999, the existing network of 124 MPAs and 15 special closures represents increased proportion of state waters protected, number and size of all MPA types, and representation and replication of marine habitats within MPAs.

Management

The MLPA emphasizes the importance of effective management for California's MPAs, which consists of strong oversight and a process for implementing the legal mandates; outreach and education, enforcement, comprehensive management planning, monitoring and evaluation, research and development, permitting, and strong social capital and long-term sustainable financing that is enhanced by partnerships. To effectively manage California's MPA network, the MLPP is defining an adaptive process focusing on a variety of management activities related to the components of effective management.

Outreach and Education

Educating the public about the MPA network is one of the MLPP goals identified in the MLPA. CDFW is committed to work with partners throughout the state to build public awareness and understanding of California's MPA network, including the identification of priorities, approaches, and coordinated efforts. The dissemination of MPA based regulatory, interpretive, and educational materials can improve outreach efforts statewide by reaching out to California's diverse public in a consistent, cohesive and multi-faceted outreach approach.

Enforcement

The MLPA emphasizes the importance of adequate enforcement as a goal of the MLPP, and identifies CDFW as the primary agency responsible for MPA enforcement. With the key intent of ensuring compliance with regulations, the objectives of enforcement revolve around operational ability (e.g., identify areas of high priority, hire personnel, etc.); cooperative efforts (e.g., coordinate with allied agencies, utilize judicial system, etc.); and public awareness, outreach, and education (e.g., establish an outreach program, hold public forums, etc.).

CDFW is responsible for enforcing marine resource management laws and regulations, including MPAs, over a vast area spanning California's coastline out to three nautical miles, and will therefore emphasize patrol of priority areas. CDFW also enforces or shares jurisdiction for some federal laws and regulations. Given CDFW's broad enforcement mandates, additional personnel and assets will be needed to effectively enforce the entire MPA network.

Regional MPA Background and Priorities Documents

To help achieve the management goals of the MLPA, Regional MPA Background and Priorities documents provide historical planning information and regional MPA design considerations and priorities moving forward; which together provide important context to base informed statewide MPA management decisions upon. They are not meant to contain specific details for management protocols and methodologies; and instead are intended as living documents that are readily accessible for reference and adaptive management, and serve as a logical starting place for guiding regionally-based activities. Each Regional MPA Background and Priorities document includes unique regional features and considerations taken into account when designing the MPAs, regional goals and objectives, summaries of regional MPAs, and regional plans for scientific and enforcement considerations.

Aligning MPAs and Other Marine Resource Management Efforts

Collaborative efforts will be crucial for taking an ecosystem-based approach in which managers across agencies and jurisdictions recognize the numerous interactions within an ecosystem, including humans, instead of focusing on a specific issue, species, or ecosystem service. The MLPA is aligning or could align with management of fisheries, water quality, climate change, marine debris, invasive species, and other existing and emerging marine management efforts. The effort to align MPA management with other marine resource management efforts is largely unprecedented and may lead to lessons learned regarding cooperative management.

MONITORING AND THE ADAPTIVE MANAGEMENT PROCESS

Defining Adaptive Management and Adaptive Management Objectives

The MLPP is coordinating with partners to develop a process of adaptive management for all core management activities. Adaptive management, required by the MLPA, is a process that facilitates learning from program actions and helps evaluate whether the MPA network is making progress toward achieving the six goals of the MLPA. An adaptive management approach provides a way to broadly share information about the effectiveness of the MPA network.

To inform the adaptive management process, the MLPP established a formal 10-year cycle of review for California's MPA network. The 10-year reviews will serve to evaluate network efficacy and for the Commission to determine whether changes in management are warranted. This timescale was chosen based on recent scientific findings on the time scales needed to demonstrate ecological change, lessons drawn from regional MPA implementation, and administrative feasibility. The formal 10-year

management review will emphasize ecological, socioeconomic, and governance aspects of the network, including scientific assessment of MPA monitoring results.

The MLPP has defined six adaptive management objectives, constructed from the MLPA goals that will determine whether the mandates of the MLPA are being met and thus help guide adaptive management. The adaptive management objectives include themes such as protecting and improving native marine life and ensuring MPA functioning as a network, while allowing sustainable opportunities for human use. These adaptive management objectives may be modified as part of the adaptive management process or in response to changing ocean conditions and threats.

Statewide MPA Monitoring Program

The need for long-term monitoring is described in the MLPA, requiring monitoring, research, and evaluation at selected sites to facilitate adaptive management and ensure that the MPA network meets its goals. Monitoring seeks to understand ecosystem condition and trends and to scientifically evaluate MPA design and to inform adaptive management. As such, long-term monitoring will form an important component of the formal 10-year management reviews.

Effective monitoring requires a partnership-based approach that leverages existing capacity across the state. CDFW partnered with OST to develop a scientifically rigorous statewide MPA monitoring framework, in the form of regional MPA monitoring plans and a statewide framework diagram. This approach was adopted by the Commission and to date, the framework has been used primarily to guide baseline monitoring efforts and provide a foundation for regional monitoring plans. Moving forward, CDFW, OPC, and OST are leading a process to develop a Statewide MPA Monitoring Program drawing from the existing statewide monitoring framework, regional monitoring plans, findings from the MPA baseline monitoring programs, and other related monitoring activities. This will be coordinated with the MSLT. Statewide MPA monitoring is composed of three interconnected components; the first two components satisfy the requirements of the MLPA, and thus take precedence over the third component, which goes beyond the scope of the MLPA.

1. **Network Scientific Evaluation Questions and Metrics:** CDFW, OST, and partners are committed to developing scientific network evaluation questions and metrics to be integrated in a statewide MPA monitoring plan. The regional MPA monitoring plans provide a starting point for developing network evaluation questions and metrics.
2. **Regional MPA Monitoring:** The state has launched a two-phase approach to MPA monitoring in each region: 1) baseline monitoring and 2) long-term monitoring. Data and information collected during baseline monitoring in the first five years of implementation describes the benchmark state from which to measure MPA performance during long-term monitoring. To date, regional monitoring plans for three regions have been developed and baseline monitoring has begun in all four regions. Following the completion of the baseline period, long-term monitoring activities will be designed to provide management decision support within the context of the Statewide MPA Monitoring Program and statewide adaptive management review process. Long-term monitoring will seek to understand conditions and trends of marine populations, habitats, and ecosystems across regions towards a statewide network scale.
3. **Beyond the MLPA:** While long-term MPA network monitoring is primarily informed by the requirements of the MLPA, it can also provide useful information for other aspects of California's ocean resource management, such as fisheries, climate change, marine debris, and invasive species.

To supplement monitoring, cutting-edge research and development can realize new possibilities for MPA monitoring and adaptive management. Research consists of scientific exploration to address relevant questions that are complementary to the goals and objectives of long-term monitoring.

Development can advance scientific knowledge and technological capacity, such as through the development of new methods or technical solutions for data collection.

Management Review Cycle

The MLPP has defined a process for adaptive management, described below.

1. **Identify and Update Objectives:** The MLPP will select statewide objectives that work toward the goals of the MLPA and other relevant policy and statutes. Baseline monitoring takes place based on the statewide goals and objectives.
2. **Long-Term Monitoring:** Following baseline monitoring and an associated five-year review, long-term monitoring based on regional and statewide objectives takes place. Concurrently, additional information may be collected to inform interim evaluation and assessment activities between 10-year reviews.
3. **10-Year Management Review:** Scientific evaluation, public scoping meetings, panel discussions, and other forums will draw on monitoring information to shed light on the status, function, and possible changes to the network for the Commission to consider at the 10-year reviews. Findings from the 10-year reviews may feed back into adaptive management of the objectives or the approach to long-term monitoring.

Throughout the entire adaptive management process, there will be the need for learning, communicating lessons, and developing and carrying out targeted research and development projects that can support monitoring and inform adaptive management.

Program Partners and Operations

The MLPP depends on collaboration to leverage existing human and financial resources, and CDFW and its partners are committed to working together to identify ways to continue to achieve the goals of the state in an efficient and effective way. The MLPP can work with partners to identify opportunities that consider jurisdictions and mandates to leverage core competencies related to MPA management. Based on their strengths and abilities, partners from different sectors will also have different roles relating to identifying, assessing, and securing funding sources. OPC, CDFW, and partners developed and updated a list of potential funding sources for the 2016 Master Plan, and will continually reevaluate existing and new potential funding sources to secure a diversified funding portfolio that ensures long-term financial sustainability.

Setting a Path Forward

To operationalize the elements of the 2016 Master Plan, the MLPP will implement a number of steps relating to its core MPA management responsibilities. Throughout the steps outlined below, the overall goal is statewide coordination to achieve effective adaptive management of California's MPA network to meet the goals and objectives of the MLPA.

- **Monitoring, Research, and Evaluation:** Select statewide metrics and evaluation questions, update and adapt regional monitoring plans as necessary, report results, link MPA and other monitoring efforts, and identify and support key MPA related research needs
- **Enforcement:** Identify tools to support enforcement
- **Partnership Coordination:** Build partnerships
- **Outreach and Education:** Prioritize outreach efforts
- **Identification of Long-Term Funding Sources:** Enhance capacity for CDFW's MPA project and prioritize potential funding sources

CHAPTER 1
Purpose and Approach

California's coastal ocean waters are among the most biologically productive in the world, enriched by seasonally persistent upwelling zones associated with coastal currents such as the California Current. California's marine resources are vital to the state's coastal economy and support a variety of economic sectors, including commercial and recreational fisheries, tourism, and non-consumptive recreation that together contribute tens of billions of dollars to California's gross domestic product.[1] These sectors provide services and benefits that enhance human well-being, including healthy sources of high-quality protein, recreational experiences, and employment and revenue in coastal communities. California's coastal ocean waters not only provide natural resources, but also spectacular scenery and aesthetic values enjoyed by Californians and visitors alike.

In the past century, humans and natural fluctuations have increased threats to marine ecosystems, which affect ocean habitats from the local to global scales. In response to these threats, California has set itself apart as a leader by taking a proactive approach to managing marine resources for long-term sustainability, thereby helping to ensure their existence for future generations. For example, the California Ocean Resources Management Act (CORMA), passed in 1990,[2] created an Ocean Resources Task Force[3] to prepare a report regarding existing ocean resources management activities and impacts.[4] In 1997, the California Resources Agency (now called the California Natural Resources Agency [CNRA]) released *California's Ocean Resources: An Agenda for the Future* (Ocean Agenda).[5] The Ocean Agenda recommended the state evaluate its array of over 20 coastal managed area classifications to develop a more effective and less complicated statewide system (Baird et al. 1999). Between 1998 and 2000, the California Legislature passed the Marine Life Management Act (MLMA, 1998),[6] the Marine Life Protection Act (MLPA, 1999),[7] and the Marine Managed Areas Improvement Act (MMAIA, 2000).[8] These foundational pieces of legislation have charted the course for ocean management, specifically regarding sustainable fisheries management and ecosystem conservation and protection, in California. In addition, the California Ocean Resources Stewardship Act (CORSA), and the California Ocean Protection Act (COPA) were integral in paving the way for the partnership-based approach to managing California's marine resources. Table 1 provides a list and descriptions of relevant legislation, programs, and plans enacted in California since 1990 (see Appendix A, Section 2 for more historical information on California's marine management policies and regulations).

[1] National Ocean Economics Program. (2015). *Ocean Economy Data*. Retrieved Sept 21, 2015 from http://www.oceaneconomics.org/Market/ocean/oceanEcon.asp
[2] California Public Resource Code (PRC) §36000-36003
[3] PRC §36300
[4] PRC §36500
[5] CNRA. (1997). *California's Ocean Resource: An Agenda for the Future*. Retrieved Sept 21, 2015 from http://www.dfg.ca.gov/mlpa/pdfs/agenda011005_8.pdf
[6] California Fish and Game Code (FGC) §90-99.5, 105, 7050-7090, 8585-8589.7, 8842, and 9001.7
[7] FGC §2850-2863
[8] PRC §36600-36900

Table 1. Summary of recent ocean and coastal state legislation, programs, and plans in California.

Policy and Year	Overview
California Ocean Resources Management Act - 1990	Declares state policy for ocean resource planning and management[9]
Marine Life Management Act - 1998	Requires ecosystem-based management of ocean fisheries and establishes a process for such management[10]
Marine Life Protection Act - 1999	Requires California to reevaluate all existing MPAs and design new MPAs that together function as a statewide network;[11] amended by the legislature in 2013 to grant the California Ocean Protection Council (OPC) the responsibility for the direction of policy of MPAs[12]
Marine Managed Areas Improvement Act - 2000	Establishes a new, simplified classification system for state marine managed areas (MMAs)[13,14]
California Ocean Resources Stewardship Act - 2000	Aims to improve the coordination of ocean resource management science in California[15]
Coastal Non-Point Source Pollution Program - 2000	Provides a single unified, coordinated statewide approach to dealing with non-point source pollution[16]
California Ocean Protection Act - 2004	Improves integration and coordination of the state's efforts to protect and conserve ocean resources[17]
California's Ocean Action Plan - 2004	Guides the state's future resources protection and management efforts and seeks to maintain California's role as a national leader in ocean affairs[18]
West Coast Governors' Agreement on Ocean Health - 2006	Constitutes a proactive regional collaboration, which protects and manages the ocean and coastal resources along the entire West Coast[19]

Recognizing the importance of California's diverse marine species and ecosystems to public health and well-being, ecological health, and ocean-dependent industries, the California Legislature passed the MLPA in 1999. Prior to the MLPA and the ensuing MPA design and siting process, California's existing MPAs were largely ineffective and disconnected rather than a system designed to function as an interconnected network that could enhance conservation returns for Californians.

[9] Gurish, J. *Overview of California Ocean and Coastal Laws with Reference to the Marine Environmen*t. Prepared for OPC. Retrieved Sept 21, 2015 from http://www.opc.ca.gov/webmaster/ftp/pdf/docs/Documents_Page/Noteworthy/Overview_Ocean_Coastal_Laws.pdf

[10] Ibid.

[11] FGC §2853(a). See CDFW's website for more information: https://www.wildlife.ca.gov/Conservation/Marine/MPAs/FAQs

[12] FGC §2850.5

[13] Ibid.

[14] MPAs are a subset of MMAs, however throughout this document the more common term "MPA" is used as an umbrella to refer to all types of protected areas (see Chapter 2.1)

[15] Ibid.

[16] California Coastal Commission. Water Quality Program Statewide Nonpoint Source (NPS) Program Information. Retrieved Sept 21, 2015 from http://www.coastal.ca.gov/nps/npsndx.html

[17] Ibid.

[18] Ibid.

[19] West Coast Governors Alliance on Ocean Health. *WCGA Overview*. Retrieved Sept 21, 2015 from http://www.westcoastoceans.org/wcga-overview

The MLPA requires the California Department of Fish and Game (now California Department of Fish and Wildlife [CDFW]) to develop, and the California Fish and Game Commission (Commission) to adopt, a master plan that guides the implementation of a Marine Life Protection Program (MLPP)[20] to address the siting of new MPAs and modifications of existing MPAs - thereby redesigning the state's MPA network.[21] To improve the design and management of California's MPAs, the MLPA guides the Commission to adopt the MLPP.[22] The MLPP has statewide goals that focus on protecting, sustaining, and conserving marine life; improving socioeconomic activities and marine heritage provided by marine ecosystems; and ensuring that the state's MPAs are designed and managed to the extent possible as a network and have clearly defined objectives, are based on scientific guidelines, and have effective management measures and enforcement.[23] Through extensive collaboration with partners, CDFW developed a master plan framework in 2005 and then a full master plan document following the adoption of the Central Coast MPAs. The Commission formally adopted the draft *California Marine Life Protection Act Master Plan for Marine Protected Areas* (2008 Master Plan)[24] as a "living" document in February 2008. The 2008 Master Plan integrated the 2005 framework, memorialized the guidance used to develop alternative MPA proposals in the Central Coast planning region, and successively guided the development of alternative MPA proposals in the North Central Coast, South Coast, and North Coast planning regions (see Chapter 2.2 and Appendix A).

Developed through partner collaboration, this 2016 Master Plan is a programmatic guidance document that describes how the MLPP will undertake tasks and activities to manage California's MPAs to the best of its ability to meet the goals of the MLPA and MMAIA.[25] Whereas the 2008 Master Plan described the process for designing and siting MPAs through a regional approach, the 2016 Master Plan focuses instead on setting a statewide foundation for MPA management, moving forward that will include regional components. Thus, the 2008 Master Plan and the 2016 Master Plan are complementary documents reflecting the continuing evolution of the MLPP. The 2016 Master Plan is intended to provide guidance to the MLPP and other natural resource management agencies, California Tribes and Tribal governments, the California Legislature, and the general public. The 2016 Master Plan is also complemented by *The California Collaborative Approach: Marine Protected Area Partnership Plan* (the Partnership Plan [see Chapter 1.1]),[26] and the MPA Statewide Leadership Team Work Plan (MSLT Work Plan).[27]

The 2016 Master Plan includes background information on California's heritage and a high-level description of California's MPA design and siting process; readers can refer to Appendix A and the 2008 Master Plan for more detailed information on these topics. The 2016 Master Plan primarily shares the operational and contextual information for management of the MPA network to meet the MLPA goals and objectives. This includes statewide guidance relative to the management and adaptive management – including monitoring, research, and development – as well as operations and funding of the MPA network and next steps to take for MPA management. In this document, management and adaptive management are discussed separately because, while the MLPP has defined its general approach to management of California's MPA network, the MLPA emphasizes the importance of an

[20] FGC §2853(b)
[21] FGC §2855
[22] FGC §2853(b)
[23] FGC §2853(b) – (c)
[24] CDFW. (2008). *Draft Master Plan for Marine Protected Areas*. Retrieved Sept 21, 2015 from https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan
[25] FGC §2861(a)
[26] OPC. (2014). *The California Collaborative Approach: Marine Protected Areas Partnership Plan*. Retrieved Sept 22, 2015 from http://www.opc.ca.gov/webmaster/ftp/pdf/docs/mpa/APPROVED_FINAL_MPA_Partnership_Plan_12022014.pdf
[27] OPC. (2015). *Marine Protected Area (MPA) Statewide Leadership Team Work Plan FY 15/16-17/18*. Retrieved Sept 21, 2015 from http://www.opc.ca.gov/2015/08/8122/

adaptive and evolving approach to management. This adaptive management process, while closely tied to existing MPA management, is a distinct process meant to build upon and feed back into MPA management. For a more detailed historical description of MPA planning through the California Marine Life Protection Act Initiative (MLPA Initiative) that led to the designation of California's MPAs pursuant to the MLPA, see Appendix A. Also appended to the 2016 Master Plan are four Regional MPA Background and Priorities documents that capture region-specific MPA planning considerations and priorities moving forward; which together provide important context to base future informed statewide MPA management decisions upon (see Appendices C-F).

To enhance the effectiveness of California's MPAs, the MLPA has six primarily ecosystem-based goals that guided the design and siting, and continue to guide the management, of MPAs:

1. Protect the natural diversity and abundance of marine life, and the structure, function and integrity of marine ecosystems.

2. Help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.

3. Improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and manage these uses in a manner consistent with protecting biodiversity.

4. Protect marine natural heritage, including protection of representative and unique marine life habitats in California waters for their intrinsic values.

5. Ensure California's MPAs have clearly defined objectives, effective management measures, and adequate enforcement and are based on sound scientific guidelines.

6. Ensure the state's MPAs are designed and managed, to the extent possible, as a network.

Guided by these six goals, the MPA design and siting process (see Chapter 2.2) resulted in the creation of a true network of 124 MPAs (Figure 1).[28] Together, this network makes up 60% of the total MPA coverage in the contiguous United States (US), placing California as a leader on MPAs both nationally and globally (Saarman & Carr 2013). Furthermore, the actions undertaken to fulfill the mandates of the MLPA, MLMA, and MMAIA put California on track to help meet the vision of the US National Ocean Policy of stewardship that "ensures that the ocean, our coasts, and the Great Lakes are healthy and resilient, safe and productive, and understood and treasured so as to promote the well-being, prosperity, and security of present and future generations."[29]

[28] Total number of MPAs includes 111 new or redesigned MPAs and 13 MPAs previously established in 2003 at the northern Channel Islands that were retained without change. Total number of MPAs does not include previously existing San Francisco Bay MPAs.

[29] The White House Office of the Press Secretary. (2010). *Executive Order: Stewardship of the Ocean, our Coasts, and the Great Lakes.* Retrieved Sept 22, 2015 from http://www.whitehouse.gov/files/documents/2010stewardship-eo.pdf

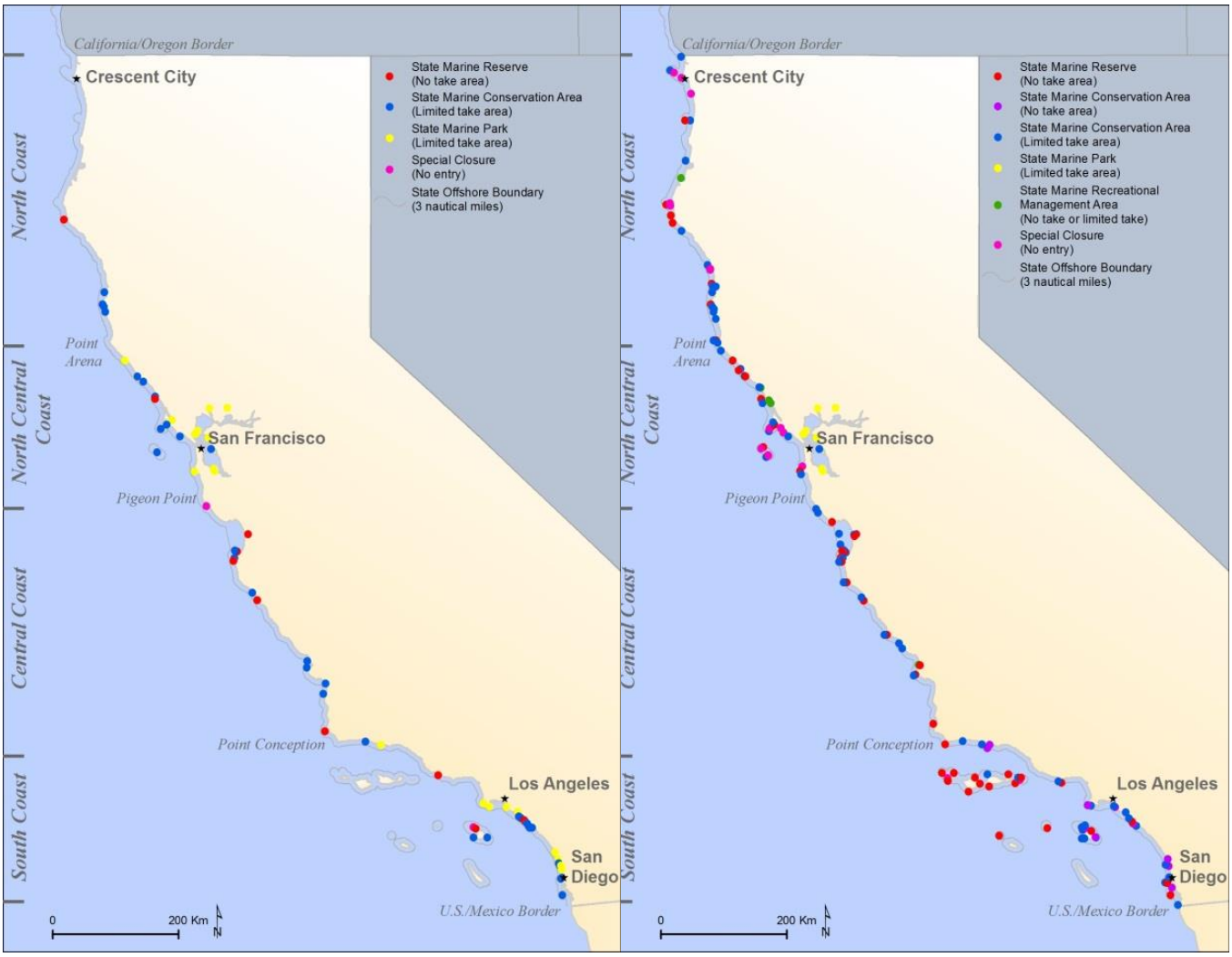

Figure 1. Map of California's MPA network before (left) and after (right) implementation of the MLPA.[30]

1.1 Natural and Human Dimensions of California's Coastal Resources

California's MPA network is situated in a geography of rich ecological and human heritage. The combination of California's bathymetry, ocean currents, and seasonal wind patterns provide the necessary conditions that lead to significant abundance and richness of its coastal ocean waters. California's shallow continental shelf is quite narrow, yet includes features such as underwater canyons, islands, offshore rocks, and rocky reefs (Johnson & Sandell 2014). Beyond this coastal zone two major currents meet around Point Conception, creating a rich transition zone that supports vast amounts of life. California's waters host a diversity of species of invertebrates, fish, reptiles, birds, mammals, marine plants, and algae, which can be found in a wide variety of habitats ranging from rocky intertidal shores to deep submarine canyons.

[30] In the pre-MLPA map, three ecological reserves, one state park and one natural preserve are shown as State Marine Conservation Areas (SMCAs) for comparative purposes. Regulations are consistent with current SMCAs.

California's inhabitants have depended on the state's marine and coastal resources for millennia (Walker & DeNiro 1986, Pritzker 2000, Erlandson et al. 2005, Rick et al. 2008). Since time immemorial, California Tribes have stewarded and utilized marine and coastal resources in the region. The foundation of their management is a collective storehouse of knowledge about the natural world, acquired through direct experience and contact with the environment, and gained through many generations of learning passed down by elders about practical as well as spiritual practices (Anderson 2005). This knowledge, which is the product of keen observation, patience, experimentation, and long-term relationships with the resources, today is commonly called "traditional ecological knowledge" (TEK) (Anderson 2005). While no single definition of TEK is universally accepted, it has been described as "a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (Berkes 1999). Traditional Knowledge (TK) encompasses TEK, science, and other relevant information from tribes. Many California Tribes continue to regularly harvest marine resources within their ancestral territories and maintain relationships with the coast for ongoing customary uses. Today, California's inhabitants and visitors continue to gain significant benefits from the state's coastal waters, including economic, nutritional, recreational, cultural, spiritual, and educational, as well as climate regulation and protection from coastal hazards.

California has the nation's second largest ocean economy and largest non-oil and/or gas economy,[31] with oceans contributing more than $44 billion to California's 2012 gross domestic product.[32] Ocean sectors that depend on marine and coastal ecosystems, including tourism, recreation, and fisheries, contributed nearly $18 billion. California's oceans also have direct impacts on the job market, producing almost 490,000 jobs in 2012, more than 365,000 of which were within the ocean and coastal tourism and recreation sectors alone.[33] The coasts also provide extensive recreational opportunities; beachgoers make more than 150 million trips to California' beaches per year[34] and in 2013 registered over 820,000 recreational vessels.[35]

A wide range of natural and human-caused factors directly and indirectly influence the abundance and diversity of populations of marine life and the habitats where they live, including shifts in oceanographic conditions (e.g., El Niño and La Niña) and numerous human activities (National Research Council 1995; Parrish & Tegner 2001; Sheehan & Tasto 2001). The development and growth of California's population and economy leads to stresses including chemical pollution and urban runoff, ocean acidification, alteration of physical habitat, invasion of exotic species, and harvest of marine resources (National Research Council 1995; Jackson et al. 2001; Sheehan & Tasto 2001, Doney et al. 2012; Samhouri & Levin 2012; Kelly et al. 2013). Climate change also poses a significant risk to California's marine resources (Ruckelshaus et al. 2008; Chen et al. 2014). While MPAs may not be appropriate for reducing the impacts of all the threats mentioned above, they can provide a tool for addressing and mitigating many of these threats.

[31] Texas has the largest ocean economy in the nation at $121 billion; however, $113 billion is contributed by the minerals sector.
[32] National Ocean Economics Program. (2015). Ocean Economy Data. Retrieved Sept 21, 2015 from http://www.oceaneconomics.org/Market/ocean/oceanEcon.asp
[33] Ibid.
[34] Kildow, J. & Colgan, C. S. (2005). *California's Ocean Economy: Report to the Resources Agency, State of Californi*a. http://www.opc.ca.gov/webmaster/ftp/pdf/docs/Documents_Page/Reports/CA_Ocean_Econ_Report.pdf
[35] US Department of Homeland Security, U.S. Coast Guard office of Auxiliary and Boating Safety. (2014). *2013 Recreational Boating Statistics*. Retrieved Sept 22, 2015 from http://www.uscgboating.org/assets/1/AssetManager/2013RecBoatingStats.pdf

1.2 Collaborative MPA Governance and Policy

To protect California's marine natural and cultural heritage, the MPA network depends on the participation and support of numerous entities. Throughout the world, the creation of management partnerships has been shown to greatly enhance the effectiveness of MPA network planning and implementation (Kelleher 1999).[36] By tapping into the specialized knowledge of state and federal agencies, California Tribes and Tribal governments, non-governmental organizations (NGOs), academic institutions, and community-based user groups, managing agencies can leverage existing capacities and increase efficiencies on activities such as outreach and education; monitoring, research, and evaluation; building compliance through enforcement; and policy and permitting. Leveraging existing human and financial resources can help ensure cost-effective management of the MPA network. Furthermore, the inclusion of a large and diverse group of stakeholders increases public knowledge, participation, and support for the network (Kelleher 1999).

As the science-based and stakeholder driven process to redesign the state's MPA network progressed in each region from design to designation and implementation (see Chapter 2.2), it became increasingly clear that the scale and scope of the redesign process required the state to revisit how management responsibilities were allocated. Although the primary management of the state MPA network is assigned by statute to CDFW,[37,38,39] no one agency or group has the authority, capacity, or resources to successfully manage the MPA network in isolation. The state has therefore committed to a partnership-based approach to fulfill its management obligations, which requires a sustained focus on implementing policies that facilitate communication and collaboration among both state and private partners in supporting MPA management.

To memorialize this approach, partner entities have signed several memoranda of understanding (MOUs) committing to collaborative planning and management of the MPA network. In August 2004, CNRA, CDFW, and the Resources Legacy Fund Foundation (now Resources Legacy Fund [RLF]) signed an MOU that launched an effort to implement the MLPA. The 2004 MOU established the MLPA Initiative, a public-private partnership, in all four planning regions (see Appendix A). The 2004 MOU was followed by amended MOUs in 2006/2007 and 2008. In 2010, a separate MOU was signed by 11 government and non-governmental entities to memorialize their commitments to effective management of California's MPA network. The 2010 MOU is titled "Memorandum of Understanding for Implementation of the California Marine Life Protection Act." The 2010 MOU was amended in 2015 to include additional federal signatories, signed by 15 government and non-governmental entities (Box 1). The MLPP's philosophy on governance and policy of the MPA network, as well as further activities and entities that are focused on a collaborative approach to management of California's MPA network, are described below.

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[36] Blue Earth Consultants, LLC. (2012). *From Design to Action: Key Elements and Innovations for Effective Marine Protected Area Network Implementation - Lessons from Successful Case Studies*. Retrieved Sept 21, 2015 from http://www.blueearthconsultants.com/wp-content/uploads/2012/11/From_Design_to_Action_Key_Elements_for-Implementing_Californias_MPA_Network.pdf

[37] FGC §2855(b)(1)-2863

[38] PRC §36600-3690

[39] Pursuant to PRC §36725: California State Parks and Recreation (State Parks) may designate, delete, or modify State Marine Reserves (SMRs), State Marine Parks (SMPs), State Marine Conservation Areas (SMCAs), state marine cultural preservation areas, and State Marine Recreation Management Areas (SMRMAs). State Parks may not designate, delete, or modify a SMR, SMP, or SMCA without the concurrence of the Commission on any proposed restrictions upon, or change in, the use of living marine resources. State Parks may manage SMRs, SMPs, state marine cultural preservation areas, and SMRMAs. The State Water Resources Control Board (SWRCB) may designate, delete, or modify state water quality protection areas. The SWRCB and the California regional water quality control boards may take appropriate actions to protect state water quality protection areas. The SWRCB may request the Department or State Parks to take appropriate management action.

MPA Governance and Policy

Governance includes the interactions among structures, processes, and traditions that determine how and by whom decisions are made, and how stakeholders have a say in the process (Lockwood et al. 2010). MPA governance in California is comprised of three general categories of regulatory authority, management, and policy that interact to facilitate the design, implementation, and adaptive management of the MPA network to achieve the goals of the MLPA. These components are led by the Commission, DFW, and OPC, respectively.

The Commission is the primary regulatory decision-making authority for regulations related to California's MPAs. The Commission provides a venue for public comment and formal review to act upon MPA proposals, stakeholder petitions, and regulatory changes.

CDFW is responsible for implementing and enforcing the regulations set by the Commission, as well as providing biological data and expertise to inform the Commission's decision-making process.[40] CDFW manages California's MPAs through enforcement; monitoring, research, and evaluation; and outreach and education.

Box 1. Signatories of the 2015 MOU for MPA management.

- California Coastal Commission
- California Department of Fish And Wildlife
- California Department of Parks And Recreation
- California Environmental Protection Agency
- California Fish and Game Commission
- California Natural Resources Agency
- California Ocean Protection Council
- California Ocean Science Trust
- California State Lands Commission
- Resources Legacy Fund
- State Water Resources Control Board
- US Coast Guard
- US Department of Defense
- US National Oceanic and Atmospheric Administration
- US National Park Service

In 2013, Senate Bill 96 delegated to the OPC the responsibility for the direction of policy of the state's MPAs.[41] To fulfill this mandate, OPC works with both agency and private partners to identify areas that would benefit from policy development. Recommendations are developed collaboratively and then brought to the OPC for consideration. Once adopted, these policies direct all agencies under CNRA in their actions related to MPAs. This approach is grounded in the foundational relationship between OPC, CDFW, and the Commission that informs actions in support of the MPA network. This support takes several forms, from formalizing and leading coordination bodies like the MPA Statewide Leadership Team (MSLT) to actively engaging private partners in collaborative dialogues with state agencies.

Marine Life Protection Program

Core to the MPA design and siting process, as well as to the ongoing management of California's MPA network, is the MLPP, established pursuant to the MLPA. The MLPP is a diverse program that includes groups involved in MPA policy and permitting, enforcement and compliance, research and monitoring, and outreach and education. The MLPP also encompasses the California's MPA network itself, as designated under the MLPA and MMAIA. Therefore, the MLPP constitutes a wide range of entities and activities that all contribute to achieving the goals of the MLPA. Importantly, the components of the MLPP are described in statute[42] and may change based on evolving needs and the outcomes of the ongoing adaptive management process.

[40] Commission. (2012). *About the Fish and Game Commission.* Retrieved Sept 21, 2015 from http://www.fgc.ca.gov/public/information/

[41] FGC §2850.5

[42] FGC §2853 - 2856

Consultation with California Tribes and Tribal Governments

As the traditional users and stewards of California's marine resources, partnership with California Tribes and Tribal governments is particularly important to the state government and the MLPP for MPA management. The state is committed to engaging in meaningful collaborations with California Tribes and Tribal governments, and Tribes can participate in many facets of MPA management, including, but not limited to, education and outreach, stewardship, research and monitoring, and compliance and enforcement. CNRA,[43] CDFW,[44] and the Commission[45] all have approved Tribal consultation policies to guide effective cooperation, communication, and consultation with Tribes and to enable California Tribes and Tribal governments to provide meaningful input for natural resource management (see Appendix B).

MPA Statewide Leadership Team

California's MSLT, led by OPC and nested within the larger MLPP, currently includes agencies and partners that have significant authority related to MPAs or marine sanctuaries. The MSLT was convened with the goal of increasing communication and collaboration among state agencies and the Monterey Bay National Marine Sanctuary and partners to ensure the state is effectively managing the statewide MPA network. The MSLT has in effect been active through collaborations on organically occurring projects and products, but was formalized in 2015. Further formalizing a commitment to communication and collaboration for MPA management, the MSLT finalized its three-year MSLT Work Plan in September 2015.[46] The MSLT's work is also informed by discussions with key non-profit organizations, Tribes, fishermen, academics, and other federal agencies that play a direct or support role in the management of the MPA Network. The MSLT has identified four focal areas around which to organize its work:

- Outreach and education
- Research and monitoring
- Enforcement and compliance
- Policy and permitting

Partnership and the California Collaborative Approach

Partnership is a common theme and core strategy underlying the MLPP and the ongoing management of California's MPA network. This section specifically highlights the MLPP's approach to partnership and collaboration, which forms the foundation of all aspects of the state's MPA network, including siting and design, management and adaptive management, monitoring, operations, and other emerging aspects as the MLPP evolves.

Building on momentum from the publically-driven design and siting phase of California's network of MPAs (see Chapter 2.2 and Appendix A), CDFW, OPC, and other partners recognized the need to institutionalize an organized and mutually beneficial approach to partnership around management of the MPA network. Therefore, CDFW, OPC, and partners developed and agreed upon an experimental partnership model – the California Collaborative Approach. The California Collaborative Approach,

[43] CNRA. (2012). *California Natural Resources Agency Adoption of Final Tribal Consultation Policy*. Retrieved Sept 21, 2015 from http://resources.ca.gov/docs/tribal_policy/Final_Tribal_Policy.pdf

[44] CDFW. (2014). *Department of Fish and Wildlife Tribal Communication and Consultation Policy*.

[45] Commission. (2015). *Tribal Consultation Policy*. Retrieved Oct 23, 2015 from http://www.fgc.ca.gov/meetings/2015/Jun/Exhibits/0610_Item_3_Tribal_Consultation_Policy.pdf

[46] OPC. (2015). *Marine Protected Area (MPA) Statewide Leadership Team Work Plan FY 15/16-17/18*. Retrieved Sept 21, 2015 from http://www.opc.ca.gov/2015/08/8122/

which is documented in the Partnership Plan,[47] takes advantage of overlapping government mandates, public interest, and science to provide support and create opportunities for the management and governance of the MPA network across sectors and geographic and political scales. Because it is the first partnership model of its kind focused on MPA network management, it will be adapted as needed as new priorities, needs, and information arise.

Table 2 describes some examples of past and ongoing collaborations, partnerships, and efforts among diverse entities including agencies, researchers, citizen scientists, and more, aimed to inform MPA management as the MLPP evolves. Table 2 is not intended to be a comprehensive summary of all MPA collaborations, partnerships, and efforts aimed to inform MPA management. MLPP partners and others will continue to identify and build new partnerships as opportunities and needs arise.

Table 2. Examples of past and ongoing MPA Collaborations aimed to inform MPA management.

Partners	Description of Collaborative Effort
CDFW, Channel Islands National Marine Sanctuary (CINMS)	• Developed Channel Islands MPA network and federal extension (see Appendix A, Section 2.3 and 3.3)
CDFW, CNRA, RLF	• MLPA Initiative (see Chapter 2 and Appendix A)
CDFW, Channel Islands National Park, CINMS, Partnership for Interdisciplinary Study of Coastal Oceans (PISCO)	• Collaborated to produce a Channel Islands MPAs 5-year monitoring report[48]
CDFW, California Ocean Science Trust (OST), OPC	• Developing and implementing a long-term Statewide MPA Monitoring Program
California Sea Grant (CASG), CDFW, OST, State Coastal Conservancy (SCC)	• Developed and implemented Central Coast MPA Baseline Monitoring Program (see Appendix E for more detail)
CASG, CDFW, OST, OPC	• Developed and implemented MPA Baseline Monitoring Programs for North Central Coast, South Coast, and North Coast (see Appendix D, Appendix F, and Appendix C, respectively, for more detail)
CDFW, OPC, OST, California Department of Parks and Recreation (State Parks), MPA Collaborative Network	• Agency staff and partners attend meetings and regularly engage with the MPA Collaborative Network
OPC, OST, CDFW, citizen science groups	• Volunteer citizen scientists collect scientific data on coastal and marine resource use
CDFW, OPC	• Policy coordination for California Environmental Quality Act process on MPAs with California Coastal Commission (CCC), State Lands Commission (SLC), State Water Resources Control Board (SWRCB), and other permitting agencies
OPC, CDFW, California Sanctuary Foundation	• CDFW and OPC funding supported the production and installation of MPA interpretive panels, regulatory signs, brochures, and kiosks

[47] OPC. (2014).*The California Collaborative Approach: Marine Protected Areas Partnership Plan*. Retrieved Sept 22, 2015 from http://www.opc.ca.gov/webmaster/ftp/pdf/docs/mpa/APPROVED_FINAL_MPA_Partnership_Plan_12022014.pdf

[48] CDFW, PISCO, CINMS, and Channel Islands National Park. (2008). *Channel Islands Marine Protected Areas First 5 Years of Monitoring: 2003-2008*. Airamé, S. and J. Ugoretz (Eds.). 20 pp. Retrieved Aug 7, 2015 from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=31325&inline=true

Partners	Description of Collaborative Effort
CDFW, OPC-Science Advisory Team (SAT)	• Integrating technical support from University of California Santa Cruz staff and SAT members to analyze impacts from scientific collecting within MPAs and how to best manage those impacts while using a more structured, objective, and quantifiable approach when reviewing permit applications for scientific collecting within MPAs
CDFW, Natural Resources Defense Council (NRDC), WiLDways	• Developed "You Are Here Signs" with NRDC that were placed along the coast and Spanish translation of materials and "You Are Here Signs" with a South Coast emphasis with WiLDways
CDFW, Ocean Communicators Alliance	• Statewide docent guides and general MPA education
CDFW, State Parks	• Developed an educational module on MPAs that is utilized in classrooms throughout the state through the PORTS program
CDFW, US Department of Defense	• Developed military safety zones around Channel Islands (see Appendix A, Section 3.3: *MPA Design and Management Considerations*)

The MSLT created four overarching management objectives that span the entire network, linked to the six MLPA goals, and complement the regional objectives. The four management objectives, as described in the Partnership Plan, include the following:

1. Governance and management process is effective and adaptive.
2. Objective, reliable, and timely scientific information and enforcement data are used in management decisions for stewardship of the statewide network.
3. Compliance with the regulations and participation in management and stewardship of the statewide MPA network is high due to effective enforcement, education, and broad awareness of the MPAs across sectors and by all key stakeholder groups.
4. State MPA network is effectively financed and sustainable over the long term.

In working together to achieve these management objectives, partners will seek to follow the guiding principles of the California Collaborative Approach, including leveraging resources, ensuring transparency, and engaging in partnerships.

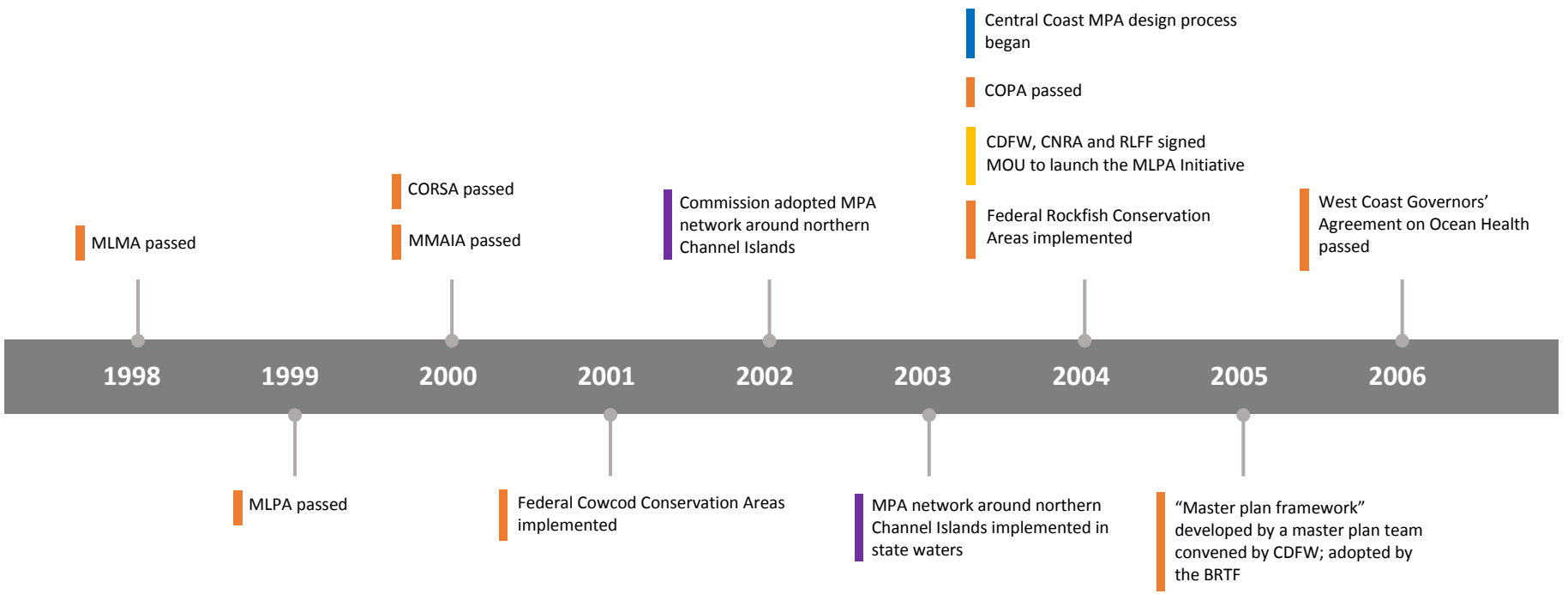
As one component of the Collaborative Approach, Community Collaboratives (Collaboratives) reflect the local-scale community focus. There are currently 14 Collaboratives, together comprising the MPA Collaborative Network.[49] Each Collaborative offers local partners and stakeholders an opportunity to engage with and have an active voice and participation to potentially inform MPA management in a way that reflects their unique community's priorities and needs. The Collaboratives are designed to be self-sufficient and provide a platform for locally-based stakeholders to organize around and support their local MPAs, while supporting the MSLT to achieve the network-wide management objectives and the MLPA goals.

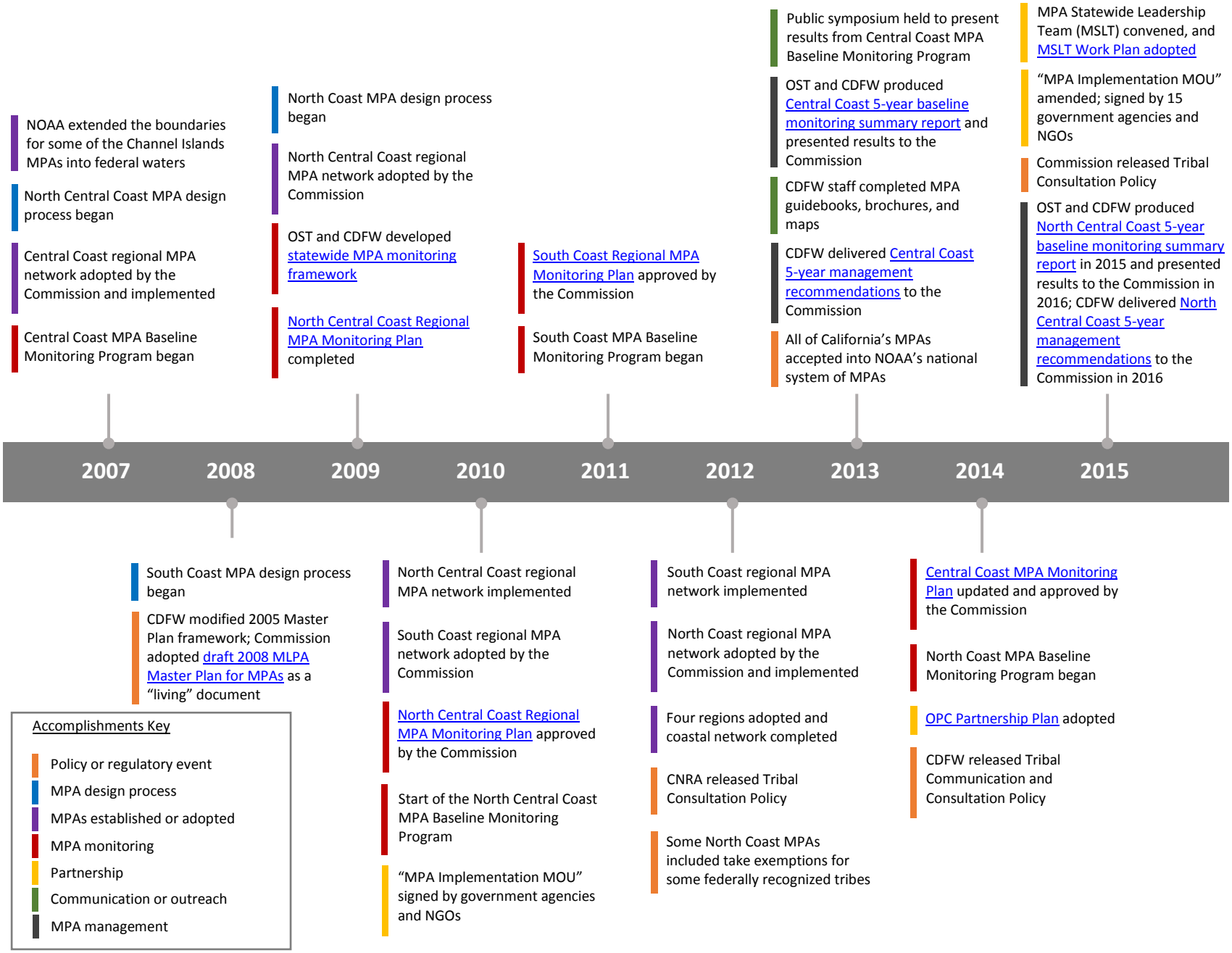
1.3 California's Marine Management Policies and MPA Milestones

Since the passage of the MLPA, the MLPA Initiative, MLPP, and the state achieved a number of accomplishments. These accomplishments relate to policies and regulation, MPA design and establishment, MPA monitoring, partnerships, communication and outreach, and other achievements. Figure 2 illustrates a timeline of some of these milestones between 1998 and 2015.

[49] MPA Collaborative Network. http://www.mpacollaborative.org/

Figure 2. California's key MPA-related milestones.




2007
NOAA extended the boundaries for some of the Channel Islands MPAs into federal waters
North Central Coast MPA design process began
Central Coast regional MPA network adopted by the Commission and implemented
Central Coast MPA Baseline Monitoring Program began
2008
South Coast MPA design process began
CDFW modified 2005 Master Plan framework; Commission adopted draft 2008 MLPA Master Plan for MPAs as a "living" document
2009
North Coast MPA design process began
North Central Coast regional MPA network adopted by the Commission
OST and CDFW developed statewide MPA monitoring framework
North Central Coast Regional MPA Monitoring Plan completed
2010
North Central Coast regional MPA network implemented
South Coast regional MPA network adopted by the Commission
North Central Coast Regional MPA Monitoring Plan approved by the Commission
Start of the North Central Coast MPA Baseline Monitoring Program
"MPA Implementation MOU" signed by government agencies and NGOs
2011
South Coast Regional MPA Monitoring Plan approved by the Commission
South Coast MPA Baseline Monitoring Program began
2012
South Coast regional MPA network implemented
North Coast regional MPA network adopted by the Commission and implemented
Four regions adopted and coastal network completed
CNRA released Tribal Consultation Policy
Some North Coast MPAs included take exemptions for some federally recognized tribes
2013
Public symposium held to present results from Central Coast MPA Baseline Monitoring Program
OST and CDFW produced Central Coast 5-year baseline monitoring summary report and presented results to the Commission
CDFW staff completed MPA guidebooks, brochures, and maps
CDFW delivered Central Coast 5-year management recommendations to the Commission
All of California's MPAs accepted into NOAA's national system of MPAs
2014
Central Coast MPA Monitoring Plan updated and approved by the Commission
North Coast MPA Baseline Monitoring Program began
OPC Partnership Plan adopted
CDFW released Tribal Communication and Consultation Policy
2015
MPA Statewide Leadership Team (MSLT) convened, and MSLT Work Plan adopted
"MPA Implementation MOU" amended; signed by 15 government agencies and NGOs
Commission released Tribal Consultation Policy
OST and CDFW produced North Central Coast 5-year baseline monitoring summary report in 2015 and presented results to the Commission in 2016; CDFW delivered North Central Coast 5-year management recommendations to the Commission in 2016
Accomplishments Key
Policy or regulatory event
MPA design process
MPAs established or adopted
MPA monitoring
Partnership
Communication or outreach
MPA management

CHAPTER 2
MPA Network Design and Siting Process

The MLPA, expertise provided by advisory groups, and rigorous stakeholder engagement processes informed the design and siting process for California's MPA network. Throughout the siting and design process, decision-makers used the best readily available science to designate MPAs with varying degrees of protection (i.e., no-take or limited take) and to integrate MPAs into a statewide network. This chapter describes the types of MPAs that comprise California's MPA network, the MLPA Initiative design and siting process, and summary statistics describing California's MPA network.

2.1 TYPES OF MARINE MANAGED AREAS

The six goals of the MLPA recognize the importance of protecting marine resources for various purposes (protecting natural diversity and abundance of marine life, sustaining and rebuilding species of economic value, and improving recreational and educational opportunities in areas subject to minimal disturbance). Thus, it is important to use multiple types of MMAs, as defined in the MMAIA, to achieve these distinct goals.[50] MPAs are a subset of MMAs (however throughout this document the more common term "MPA" is used as an umbrella to refer to all types of protected areas), and include three MPA classifications (State Marine Reserve [SMR], State Marine Conservation Area [SMCA], State Marine Park [SMP][51]) and one MMA classification (State Marine Recreational Management Area [SMRMA]). The special closure designation, which is not an MPA, is used by the Commission for relatively small, discrete marine areas to also contribute to the goals of the MLPA through protections complementary to MPAs.[52] General definitions for these classifications of the protected areas adopted pursuant to the MLPA are described in Table 3 below. For regulations pertaining to areas declared by the Commission to be MPAs, MMAs, and special closures, see California Code of Regulations (CCR), Title 14, Section 632[53,54] and the descriptions of California's MPAs on CDFW's website.[55]

To date, there has been relatively little direct comparison between the relative benefits of multiple use areas such as marine parks and marine conservation areas compared to no-take marine reserves (Lester & Halpern 2008; Coleman et al. 2013; Kelaher et al. 2014). Because approximately 40% of California's MPA area (or about 6.5% of California's total 5,285 square miles of state waters[56]) is in SMCAs, SMCA/SMPs, and SMRMAs – which allow multiple uses including limited take – California's MPA network will provide an opportunity to build scientific knowledge about the effects of different types of MPAs.

[50] FGC §2852[c]
[51] The State Park and Recreation Commission has purview over the addition of SMPs
[52] Special closures derive from the ecological reserve authority in FGC §1583 to protect terrestrial resources such as nesting sites and pup haul-out areas
[53] CCR. Retrieved Mar 4, 2015 from https://govt.westlaw.com/calregs/
[54] CCR, Title 14, Section 632 defines provisions for a number of prohibitions and allowances on topics such as access, anchoring, transit or drifting through MPAs or other MMAs, public safety, and Tribal take
[55] Descriptions of California's MPAs are provided on the CDFW website: https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Network
[56] The boundary of state waters for the purposes of the 2016 Master Plan is from mean high tide to three nautical miles offshore of all intertidal rocks and mouths of embayments, including large open bays (excluding state waters in San Francisco Bay, which represent approximately 473 square miles). This method of measurement creates instances where the state water boundary is further offshore than three nautical miles (e.g., Monterey Bay and the area around Reading Rock).

The MLPP recognizes that designating a network that includes multiple types of MPAs may prove to be problematic relative to enforcement and public understanding of different regulations within contiguous areas. Differences in regulations in MPAs can lead to unintentional infractions and a degradation of the function of MPA network. Therefore, as regulations are developed and continually updated, care must be taken to ensure that regulations are understandable, observed by the public, and enforced as necessary.

2.2 MLPA Initiative Process and Outcomes

The MLPA passed in 1999, followed by the MMAIA in 2000. Following two unsuccessful attempts to implement the MLPA due to lack of funding and resources, CDFW entered into a public-private partnership called the MLPA Initiative to undertake implementation of the MLPA. This section describes the MLPA Initiative and the design, siting, and implementation process that was carried out between 2004 and 2012 (see Appendix A). In addition, this section shares the results of this process at the statewide and regional scales.

Following the statewide goals, the MLPA outlined guidelines for the design and siting of the MPA network. The MLPA required the network to comprise areas with various levels of protection, including the following elements:[57]

1) An improved marine life reserve component [known as the backbone of the network] consistent with the guidelines for the preferred siting alternative (see Appendix A, Boxes 1 and 3).
2) Specific identified objectives, and management and enforcement measures, for all MPAs in the system.
3) Provisions for monitoring, research, and evaluation at selected sites to facilitate adaptive management of MPAs and ensure that the system meets the goals stated in this chapter.
4) Provisions for educating the public about MPAs, and for administering and enforcing MPAs in a manner that encourages public participation.
5) A process for the establishment, modification, or abolishment of existing MPAs or new MPAs established pursuant to this program.

MLPA Initiative: Establishment and Design and Siting Process

The MLPA Initiative was a comprehensive, highly collaborative, transparent, and iterative process guided by MOUs and enhanced by the advice of stakeholders, scientists, resource managers, and interested members of the public. Over the course of 2004 to 2012, the MLPA Initiative worked together to match public and private resources to direct and inform four regional science-based, stakeholder-driven processes (see Figure 3).

[57] FGC §2853(c)

Table 3. Definitions and overview of MPA classifications.

Classification	Definition	Summary	Additional Information
State Marine Reserve (SMR)	In a **state marine reserve**, it is unlawful to injure, damage, take, or possess any living, geological, or cultural marine resource, except under a permit or specific authorization from the managing agency for research, restoration, or monitoring purposes. While, to the extent feasible, the area shall be open to the public for managed enjoyment and study, the area shall be maintained to the extent practicable in an undisturbed and unpolluted state. Access and use for activities including, but not limited to, walking, swimming, boating, and diving may be restricted to protect marine resources. Research, restoration, and monitoring may be permitted by the managing agency. Educational activities and other forms of non-consumptive human use may be permitted by the designating entity or managing agency in a manner consistent with the protection of all marine resources.[58]	• Prohibits all take and consumptive use (commercial and recreational, living or geologic); scientific research and non-consumptive uses are allowed[59] • Definition is consistent with "marine life reserve" in MLPA	• Scientific collecting permits (SCP) may be issued by CDFW pursuant to Section 650 of the CCR, Title 14, or specific authorization from the Commission for research, restoration, or monitoring purposes • Boating, diving, research, and education may be allowed, to the extent feasible, as long as the area is maintained "to the extent practicable in an undisturbed and unpolluted state," but activities may be restricted to protect marine resources, including non-extractive activities[60] • Restrictions must be based on specific objectives for an individual site and the goals and guidelines of the MLPA[61] • Does not imply that navigation will necessarily be restricted though MPAs or that other non-extractive activities will be regulated
State Marine Conservation Area (SMCA)	In a **state marine conservation area**, it is unlawful to injure, damage, take, or possess any living, geological, or cultural marine resource for commercial or recreational purposes, or a combination of commercial and recreational purposes that the designating entity or managing agency determines would compromise protection of the species of interest, natural community, habitat, or geological features. The designating entity or managing agency may permit research, education, and recreational activities, and certain commercial and recreational harvest of marine resources.[62]	• May allow select recreational and commercial harvest to continue; scientific research and non-consumptive uses are allowed	• SCPs may be issued by CDFW pursuant to Section 650 of the CCR, Title 14, or specific authorization from the Commission for research, education, or recreational purposes and certain commercial and recreational harvest, provided it does not compromise protection • Fishing restrictions may vary by focal species, fishing gear, habitats, and goals and objectives of individual MPA[63]

[58] PRC §36710(a)
[59] PRC §36710(a)
[60] PRC §36710(a)
[61] FGC §2852(c)
[62] PRC §36710(c)
[63] At present, the large fishery closures known as the Cowcod Conservation Areas and the Rockfish Conservation Area may function as *de facto* SMCAs in that bottom fishing for finfishes is prohibited but other types of fishing are allowed, though the specific regulations in these areas are subject to change dependent on stock assessments

Classification	Definition	Summary	Additional Information
No-take State Marine Conservation Area (no-take SMCA)	See SMCA definition.	• Prohibits all take and consumptive use, except for the take incidental to existing permitted activities such as infrastructure maintenance or water quality operations	• Pre-existing activities and artificial structures including, but not limited to, wastewater outfalls, piers and jetties, maintenance dredging, and beach nourishment occur throughout heavily urbanized areas • Activities are regulated by other federal, state, and local agencies whose jurisdiction cannot be pre-empted through designation of MPAs pursuant to the MLPA[64] • The Commission identified MPAs with existing structures, and designated them as no-take SMCAs and *only* these regulated activities are allowed to continue under current permits
State Marine Park (SMP)	In a **state marine park**, it is unlawful to injure, damage, take, or possess any living or nonliving marine resource for commercial exploitation purposes. Any human use that would compromise protection of the species of interest, natural community or habitat, or geological, cultural, or recreational features, may be restricted by the designating entity or managing agency. All other uses are allowed, including scientific collection with a permit, research, monitoring, and public recreation, including recreational harvest, unless otherwise restricted. Public use, enjoyment, and education are encouraged, in a manner consistent with protecting resource values.[65]	• Prohibits commercial take, but may allow select recreational harvest to continue; scientific research and non-consumptive uses are allowed • Prohibits injuring, damaging, taking, or possessing for commercial use any living or non-living marine resources[66]	• Other uses that would compromise the protection of living resources, habitat, geological, cultural, or recreational features may be restricted, while all other uses are allowed, consistent with protecting resources • SCPs may be issued by CDFW pursuant to Section 650 of the CCR, Title 14, or specific authorization from the Commission for research, monitoring, and education and certain recreational harvest in a manner consistent with protecting resources • State Parks Commission designates SMPs • Fishing restrictions may vary by focal species, habitats, and goals and objectives of individual MPAs[67]

[64] For example, wastewater discharge permitted by the SWQCB is not considered to involve take within MPAs, and for the purposes of MPA management, the relation of wastewater discharge to allowable take is at the discretion and jurisdiction of the State and Regional Water Quality Control boards.
[65] PRC §36710(b)
[66] PRC §36700-36900
[67] At present, the large fishery closures known as the Cowcod Conservation Areas and the Rockfish Conservation Area may function as *de facto* SMCAs in that bottom fishing for finfishes is prohibited but other types of fishing are allowed, though the specific regulations in these areas are subject to change dependent on stock assessments

Classification	Definition	Summary	Additional Information
State Marine Conservation Area / State Marine Park (SMCA/SMP)	See SMP definition.	• MPA designated as SMCA by the Commission and SMP by California State Park and Recreation Commission	• Only one MPA (Cambria SMCA/SMP) currently has this dual designation, as it was adopted by both Commissions at separate times with the same set of regulations and boundaries (Pope 2014) • Cambria SMCA/SMP is jointly managed by CDFW and State Parks
State Marine Recreational Management Area (SMRMA)	In a **state marine recreational management area**, it is unlawful to perform any activity that, as determined by the designating entity or managing agency, would compromise the recreational values for which the area may be designated. Recreational opportunities may be protected, enhanced, or restricted, while preserving basic resource values of the area. No other use is restricted.[68] The Fish and Game Commission may designate, delete, or modify state marine recreational management areas for hunting purposes.[69]	• Provides subtidal protection equivalent to an MPA while allowing legal waterfowl hunting, scientific research, and non-consumptive uses	• MMA designation • Recreational opportunities may be protected, enhanced, or restricted while preserving basic resource values of the area
Special Closure	A special closure is an area designated by the Commission that prohibits access or restricts boating activities in waters adjacent to seabird rookeries or marine mammal haul-out sites.	• This designation, which is not categorized as an MMA, is used by the Commission for relatively small, discrete marine areas to also achieve the goals of the MLPA	• Integrated into the MLPA process and used to reduce disturbance of nesting or roosting seabirds or hauled out or breeding marine mammals that would not otherwise be protected by MPA designation within the same geographical region • Special closures provide an exception to allow CDFW employees and employees of other specified government agencies to enter the area • Special closures also include an allowance for CDFW to grant permission to access the area at its discretion

[68] PRC §36710(e)
[69] PRC §36725(a)

MLPA Initiative staff varied among planning regions, and worked with CDFW staff with scientific expertise and/or knowledge of state policy and resource management, CDFW enforcement staff, California Department of Parks and Recreation (State Parks) staff, Regional Stakeholder Groups, Master Plan Science Advisory Team (SAT) members, the Statewide Interests Group (SIG), and/or professional contract staff with other required skills to accomplish MPA planning, project management, decision support tool development, facilitation, and mediation. The MLPA Initiative established an MLPA Blue Ribbon Task Force (BRTF), together with a SAT and a stakeholder advisory group (Stakeholder Group) to oversee the achievement of several initial objectives for overall MPA planning in each region.[70] See Figure 4 for a description of the primary roles of each of the three main MLPA Initiative bodies.

The first of the planning objectives for the MLPA Initiative was to complete a master plan framework, adopted by the BRTF in 2005, which included guidance based on the MLPA for the development of alternative MPA proposals statewide. Other important early objectives included establishing a timeline, organizational structure, requirements, work products, and funding for MPA planning. Rather than attempting to design a single MPA network for the entire state at one time, the MLPA Initiative called for the redesign of a statewide network of MPAs by 2011 through a series of geographic planning regions. The state was split into five distinct regions – North Coast, North Central Coast, Central Coast, South Coast, and the San Francisco Bay (see Figure 3). Each region held its own regional MPA public planning process, except the San Francisco Bay. MPA planning in San Francisco Bay will be influenced by the results of the Sacramento-San Joaquin Rivers Delta process and, therefore, MPA planning will occur once that process is complete (see Appendix A).

Figure 3. Map highlighting the five MLPA planning regions and planning periods.

[70] Complete lists of BRTF, SIG, SAT, and Stakeholder Group (or Regional Stakeholder Group [RSG]) members can be found on CDFW's website: https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Planning-Process

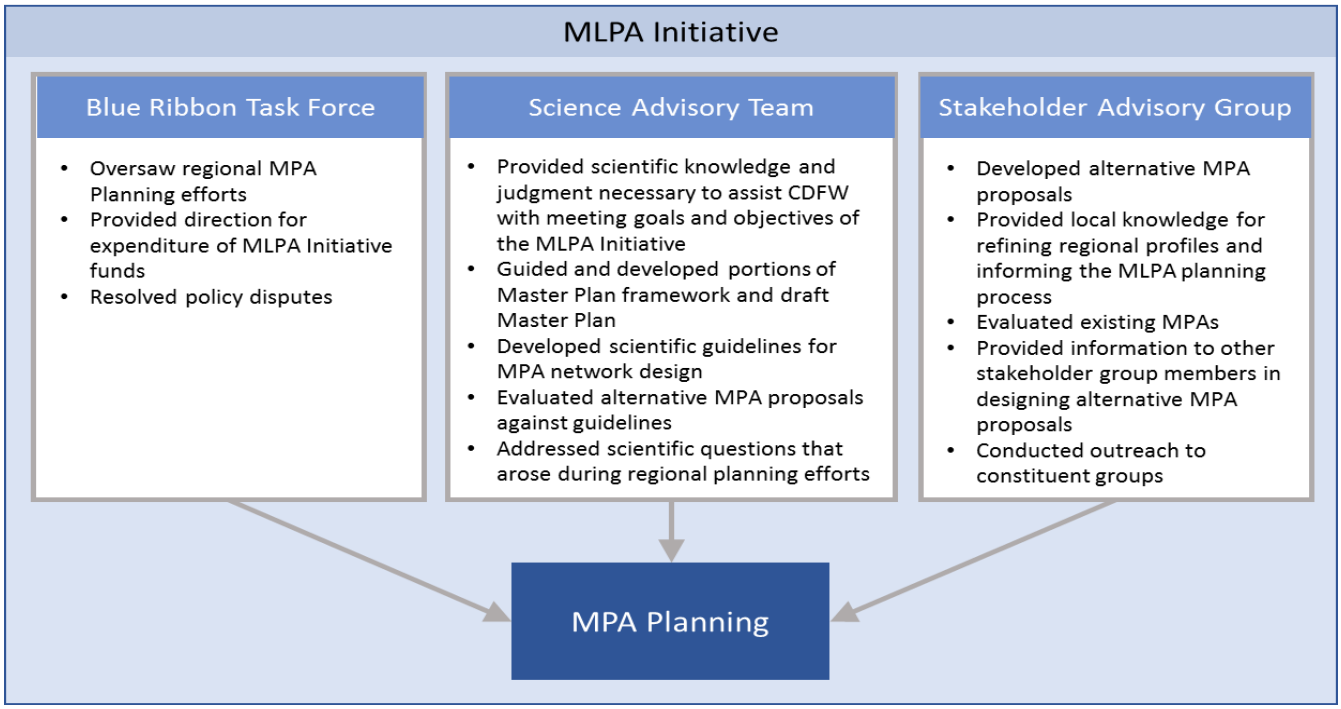


Figure 4. Description of three planning bodies that supported the MPA design and siting phase for each MLPA planning region.

Scientific Foundation for MPA Network Design

In order to prepare the master plan and take full advantage of scientific expertise on MPAs, the MLPA directed CDFW to appoint a Master Plan Team, including science advisors, for advice and assistance.[71] CDFW staff and Master Plan Team scientists played a significant role in guiding and developing components of both the master plan framework adopted by the BRTF in 2005 and the draft Master Plan adopted by the Commission in 2008, resulting in: 1) more specific guidelines for how to implement the broad guidance in the MLPA, and 2) detailed guidance on a variety of scientific considerations in the design of MPAs (see the 2008 Master Plan, Chapter 3). The overall MPA network design guidance addressed statutory requirements for MPA network design and provided a foundation for the SAT to apply a methodology to evaluate alternative MPA proposals in each planning region (Kirlin et al. 2013). The MLPA Initiative was a science-based and stakeholder-driven MPA planning process that utilized the best readily available science,[72] and accordingly, the MPA planning process drew from an existing body of work on both the science underlying MPA design and siting as well as previous MPA management efforts from around the world. Throughout the MPA design process, some of the top MPA scientists worldwide played active roles in both the development and review of regional proposals. To pave the way for positive outcomes of California's MPA network, the MLPP utilized three primary sources of scientific guidance to guide MPA network design: the MLPA, the 2008 Master Plan, and the SAT (see Appendix A, Section 4).

[71] FGC §2855(b)(1)

[72] For more information on CDFW's approach to using the best readily available science, see the California Fish and Game Commission, *Final Statement of Reasons for Regulatory Action* documents:
http://www.fgc.ca.gov/regulations/2007/165_632fsor.pdf for the Central Coast (2007);
http://www.fgc.ca.gov/regulations/2009/632fsor.pdf for the North Central Coast (2010);
http://www.fgc.ca.gov/regulations/2010/632fsor.pdf for the South Coast (2011); and
http://www.fgc.ca.gov/regulations/2012/632ncfsor.pdf for the North Coast (2012)

Influence of Science in California's MPA Network

California's MPA network generally reflects the integration of the science and science-based MPA design guidelines from the MLPA, the 2008 Master Plan, and SAT guidance. When compared to California's MPAs in 1999 (prior to the MLPA), there is a dramatic increase in the proportion of state waters protected and an increase in the number and size of all MPA types (see Table 4). The redesigned MPA network represents a substantial increase in the representation and replication of marine habitats within MPAs, including sandy beaches, rocky shores, kelp, shallow rocky reef/kelp forest (0-30m), mid-depth rocky reef (30-100m), deep rocky reef (100-3000m), shallow sand (0-30m), mid-depth sand (30-100m), deep sand (100-3000m), estuaries, marsh, and eelgrass habitats. There is also a reduction in the distance between habitats protected in MPAs (Saarman et al. 2013; see Tables 1-4 in Appendices C-F, Section 4 for more detailed statistics on each region).

Table 4. Comparison of protected areas prior to the MLPA in 1999 and present.

	Pre-MLPA (1999)[73,74]					Post-MLPA (2016)[75]				
Protected Area	**Count Number**	**Min Size**	**Max Size**	**Total Area**	**Mean Size**	**Count Number**	**Min Size**	**Max Size**	**Total Area**	**Mean Size**
No-take[76]	10	0.04	2.5	12.1	1.2	59	0.01	40.7	507.9	8.6
Limited Take[77,78]	53	0.01	30.8	129.8	2.4	65	0.06	23	344.1	5.3
Special Closure	2	0.64	2.2	2.8	1.4	15	0.01	1	3.3	0.2

While science guidelines strongly influenced the design of California's MPA network, the nature of the highly participatory, stakeholder-driven process led to some tradeoffs between ecosystem protection and socioeconomic considerations in California's MPA network (Gleason et al. 2013; Saarman et al. 2013). For example, one third of the MPAs considered sufficiently protective to contribute to the conservation goals of the MLPA fell below the minimum MPA size recommended by the SAT (Saarman et al. 2013). Examples like this, where science guidelines were not universally followed, highlight the multiple considerations taken into account during MPA planning, which encompass both ecological and socioeconomic priorities.

[73] Includes only coastal MPAs (excludes existing San Francisco Bay MPAs); area units are in square miles
[74] Pre-dates MMAIA; areas included are more variable in designation but are included due to similarity to current MPA take regulations
[75] Includes only coastal MPAs; area units are in square miles
[76] No-take includes SMRs and no-take SMCAs
[77] Limited take includes SMRMAs, SMCAs, SMPs, State Parks, State Marine Natural Preserves, and Ecological Reserves
[78] Restrictions are highly variable across all designations, however pre-MLPA areas are generally less restrictive compared to post-MLPA areas

Iterative Development of Alternative Regional MPA Proposals

The BRTF selected the Central Coast region as the initial planning region from which to launch the MLPA Initiative (2004-2007).[79] The Central Coast planning region was followed by the North Central Coast (2007-2010), South Coast (2008-2012), North Coast (2009-2012), and the San Francisco Bay (timing to be determined).[80] The same general iterative process for MPA design was used in each planning region (Box 2), most of which the stakeholder groups and SATs undertook. The overall aim was for the BRTF to select a set of alternative MPA proposals, including a preferred alternative, for each region and for the Commission to adopt one of the alternatives (see Appendix A).[81]

Box 2. Process for regional MPA planning.

1. **Regional Planning:** Preparation of a regional profile;[a] engagement of Stakeholder Group and SAT; development of additional advice; and identification of alternative approaches to networks and potential MPA sites.
2. **MPA Planning:** Stakeholder Group development of proposals for MPAs after evaluation of existing and new MPAs and other management activities.
3. **Evaluating Proposals:** SAT, BRTF, and CDFW analysis and evaluations; SAT evaluation of MPA proposals developed by the stakeholder group against the goals of the MLPA; BRTF evaluation of proposals based on factors including SAT guidelines, CDFW feasibility criteria, socioeconomic impacts, and cross-interest support[b] and forwarding a preferred alternative and other alternatives to the Commission; CDFW feasibility analysis, comments on alternatives, and development of initial regulatory documents based on Commission direction.
4. **Commission Action on Alternative MPA Proposals:** Preparation of regulatory analyses, including California Environmental Quality Act review; public testimony; and action by the Commission.

[a] Regional profiles for each planning region can be found on the CDFW website: https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Planning-Process

[b] MLPA Initiative. (2010). *Updated Summary of Key Guidance Provided in Previous Marine Life Protection Act Study Regions for the Development of Marine Protected Area Proposals*. Retrieved Sept 21, 2015 from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=17238&inline=true

Alternative MPA proposal development in each planning region was an adaptive, flexible, and iterative process that incorporated multiple rounds of MPA design, evaluation, feedback, and redesign (Figure 5). While the same general MPA planning process structure was used throughout the four coastal planning regions, specific details regarding alternative MPA proposal development varied and the iterative nature of the process allowed for adaptation based on lessons learned and unique characteristics of each region. For example, in the North Coast MPA planning process, due mostly to relatively small population size and strength of public involvement, external groups were supported to develop MPA proposals for the first round prior to convening the stakeholder group. Multiple rounds of MPA proposal development also provided stakeholder groups with evaluations of the extent to which their draft proposals would meet science and feasibility design guidelines, built trust among stakeholders, increased awareness of constituencies' particular interests, allowed the stakeholder

[79] MLPA Initiative. (2005). *California MLPA Blue Ribbon Task Force Selects Central Coast Study Region for Developing Alternative Network Components of Marine Protected Areas*. Retrieved July 22, 2015 from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=78000

[80] Options for a planning process in the fifth region, San Francisco Bay, have been developed for consideration at a future date. See Appendix A and CDFW's website for more information: http://www.wildlife.ca.gov/Conservation/Marine/MPAs/Network/San-Francisco-Bay

[81] CDFW. (2015). *Overview of Alternative Marine Protected Area Proposals: The Marine Life Protection Act Initiative (2004 – 2012).* Retrieved Sept 21, 2015 from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=107532&inline

group to develop improved cross-interest proposals, accommodated decision support-tools such as MarineMap that allowed stakeholders to collaboratively develop MPA designs, and increased and facilitated interactions between MLPA Initiative bodies and interested members of the public (Gleason et al. 2010; Fox et al. 2013a, b; Merrifield et al. 2013). In addition, in the South Coast and North Coast planning regions, State Parks and MLPA Initiative staff evaluated MPA proposals for recreation and public access opportunities. All alternative MPA proposals that were considered and reviewed by the Commission, but ultimately not selected for each planning region, can be found on the CDFW website.[82]

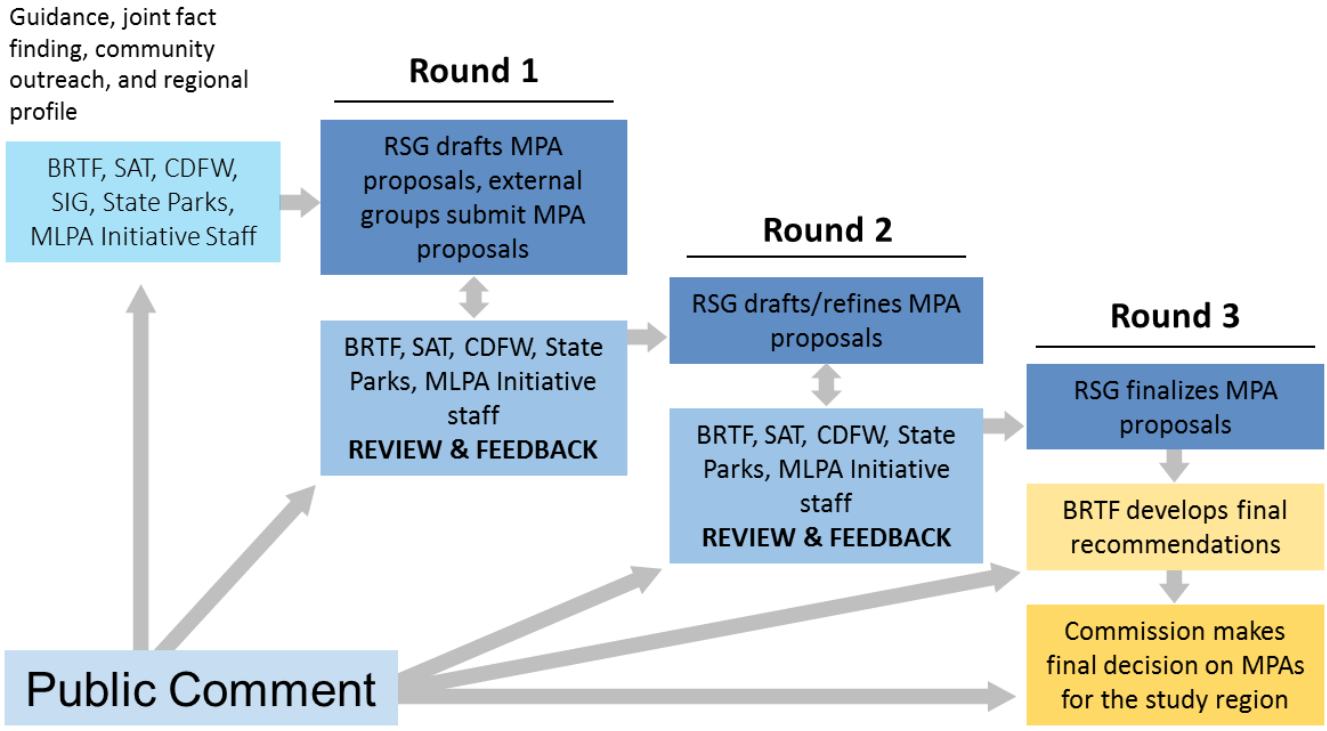


Figure 5. General process used by the MLPA Initiative to develop alternative MPA proposals in each regional MPA planning process or planning region.

[82] CDFW. (2015). *Overview of Alternative Marine Protected Area Proposals: The Marine Life Protection Act Initiative (2004-2012).* Retrieved Sept 23, 2015 from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=107532&inline

MPAs Adopted Pursuant to the MLPA

Drawing from science guidance and expert advice, California redesigned its system of MPAs into a more cohesive statewide network (see Figure 1). Completed in December 2012, California's MPA network currently represents the largest scientifically-based network in the contiguous US to date, and thus the MLPA Initiative process may offer valuable insights for MPA network planning elsewhere in the US and around the world (Gleason et al. 2013).

Statewide MPA Summary

California's 63 existing MPAs prior to the MLPA were primarily established in an ad hoc manner, were mostly small (covering 2.7% of state waters with less than 0.25% in no-take MPAs), and were considered to be ineffective. Since the passage of the MLPA and the completed redesign of California's MPA network, California now has 124 MPAs and 15 special closures. California's MPA network encompasses about 852 square miles, or 16% of state waters, and approximately 9.6% of which is in no-take MPAs (about 9.0% in SMRs and 0.6% in no-take SMCAs). The majority of MPA coverage by designation type across California's MPA network is in SMRs (55.7%) and SMCAs (39.1%), with substantially less coverage in no-take SMCAs (3.9%), SMCA/SMPs (0.7%), and SMRMAs (0.5%), respectively (Figure 6).

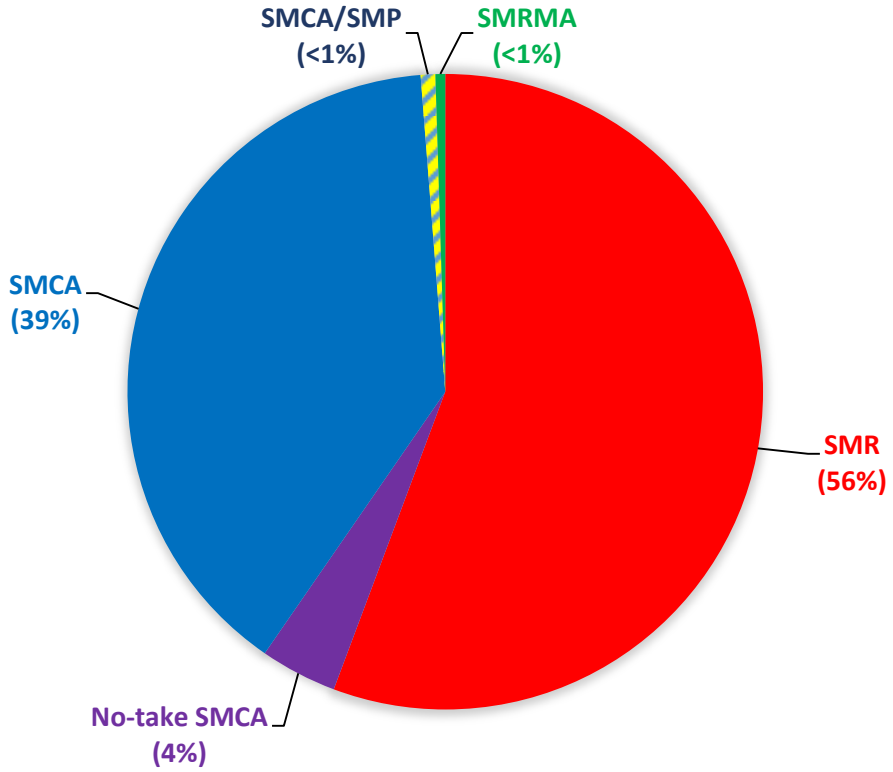


Figure 6. Percent of MPA coverage by designation type across California's MPA network.[83]

[83] All numbers represent rounded values and totals include all MPAs in the North Coast, North Central Coast, Central Coast, and South Coast regions; and do not include existing San Francisco Bay MPAs or special closures

Figure 7 illustrates the percent of 12 of California's most representative habitats protected statewide in MPAs, by MPA designation type. Deep rock, marsh, rocky shores, and mid-depth rock are the most represented habitats, with shallow sand and estuary showing the least representation. The majority of habitats are represented in SMRs and SMCAs. See Appendices C-F, Section 4 for detailed statistics of California's most representative habitats in individual MPAs.

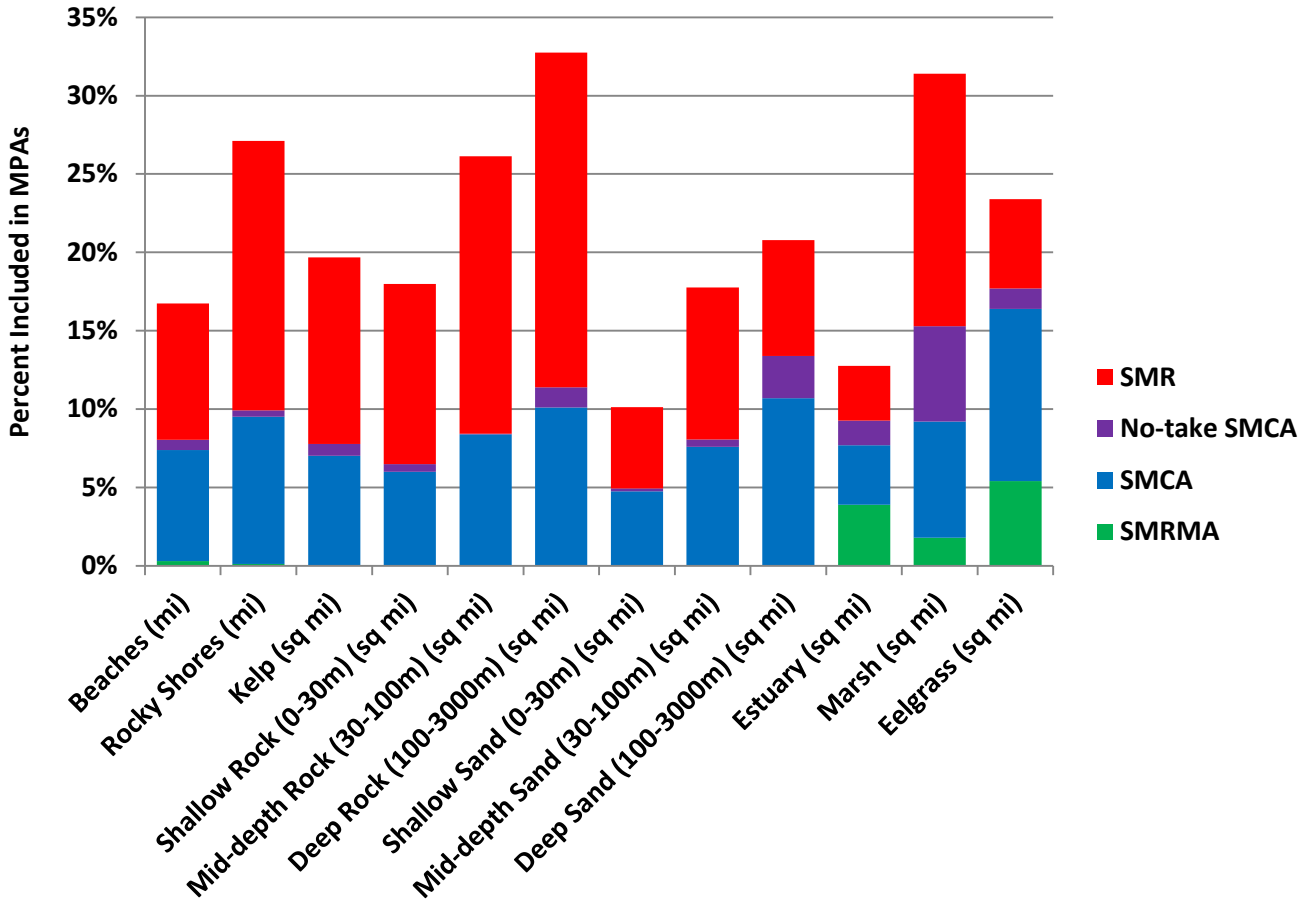


Figure 7. Percent of total known representative habitats in MPAs by designation throughout California's state waters.[84]

[84] All numbers represent rounded values and totals include all MPAs in the North Coast, North Central Coast, Central Coast, and South Coast regions; and do not include existing San Francisco Bay MPAs or special closures. The single SMCA/SMP designation in California's statewide network (Cambria SMCA/SMP) is too nominal to report.

Summary of Regional MPAs Adopted

Resulting from the design and siting phase, each planning region contained a unique set of MPAs of varying types (see Table 3 for an overview of MPA types). Table 5 provides a summary of the number of MPAs in each region and the area of coverage for each type. The North Central Coast has the largest coverage of MPAs (20.0%) and the North Coast has the least (13.4%). In addition, the South Coast has the largest area of state waters under protection (355.5 square miles and 15.1% of the region). Figure 8 provides an overview of the percent of coastal area within each type of MPA for each planning region; below is additional detail on each of the four planning regions.

Table 5. Summary statistics of MPAs within state waters across all planning regions.[85]

Type of MPA	North Coast		North Central Coast		Central Coast		South Coast	
	MPAs (number)	Area of State Waters (square miles)	MPAs (number)	Area of State Waters (square miles)	MPAs (number)	Area of State Waters (square miles)	MPAs (number)	Area of State Waters (square miles)
SMR	6	51.3	10	84.2	14	97.4	19	241.8
No-take SMCA[86]	0	0.0	0	0.0	0	0.0	10	33.2
SMCA	13	85.3	12	67.6	13	100.1	21	80.4
SMCA/SMP	0	0.0	0	0.0	1	6.3	0	0.0
SMRMA	1	0.8	3	0.6	1	3.1	0	0.0
Special Closures	7	0.2	6	1.2	0	0.0	2	1.9
Total[87]	**20**	**137.4**	**25**	**152.4**	**29**	**206.8**	**50**	**355.5**

North Coast: Covers approximately 1,027 square miles of state waters from the California/Oregon border south to Alder Creek near Point Arena (Mendocino County). MPAs and special closures were adopted June 6, 2012 by the Commission and went into effect on December 19, 2012.

North Central Coast: Covers approximately 763 square miles of state waters from Alder Creek near Point Arena south to Pigeon Point (San Mateo County). MPAs and special closures were adopted August 5, 2009 by the Commission and went into effect May 1, 2010.

Central Coast: Covers approximately 1,144 square miles of state waters from Pigeon Point, south to Point Conception (Santa Barbara County). MPAs were adopted April 13, 2007 by the Commission and went into effect September 21, 2007.

South Coast: Covers approximately 2,351 square miles of state waters from Point Conception south to the California/Mexico border, including state waters around the Channel Islands. MPAs and special closures were adopted December 15, 2010 by the Commission and went into effect on January 1, 2012.

[85] Statistics are from CDFW's Marine Region Geographic Information System unit. Values are current as of March 2016 and are subject to change as improvements in geographic data become available: https://www.wildlife.ca.gov/Conservation/Marine/GIS

[86] No-take SMCA is an administrative term for an SMCA that would have been an SMR but for certain pre-existing permitted activities onsite (see Table 3)

[87] Totals do not include existing San Francisco Bay MPAs or special closures

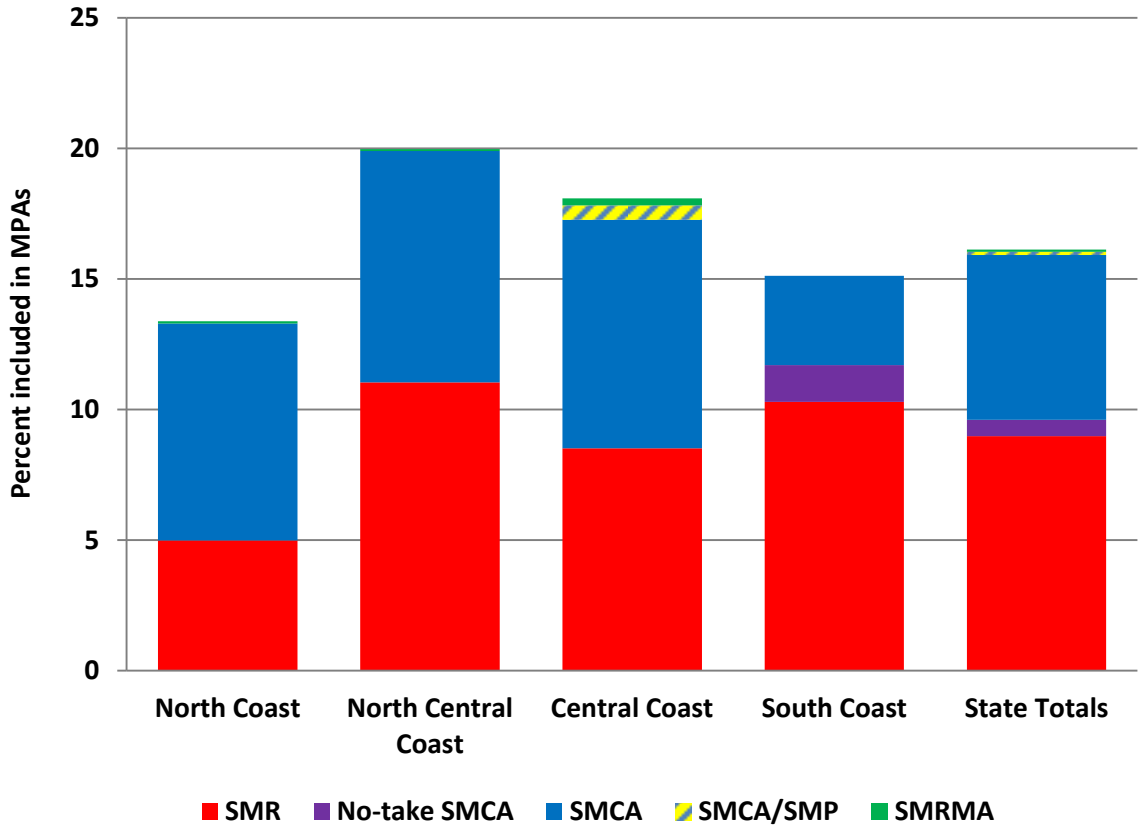


Figure 8. Percent of state waters for each MLPA planning region and statewide in MPAs.[88]

[88] Totals include all MPAs in the North Coast, North Central Coast, Central Coast, and South Coast regions; and do not include existing San Francisco Bay MPAs or special closures

CHAPTER 3
Management

The MLPA emphasizes the importance of effective management measures for California's MPAs. For California's MPA network, effective management consists of an MPA network that has strong oversight and a process for implementing the legal mandates; outreach and education, enforcement, comprehensive management planning, monitoring and evaluation, research and development, permitting, and strong social capital and long-term sustainable financing that is enhanced by partnerships. This chapter describes the MLPP's approach to managing California's MPA network. Chapter 4 describes a strong process for adaptive management that seeks to improve MPA management and enable learning and course-correction based on monitoring and evaluation, as well as lessons learned throughout ongoing management. Through these management elements, the MPA network may meet its stated goals and objectives.

The MLPA states that California's MPAs should be designed and managed, to the extent possible, as a statewide network.[89] Following this direction, significant efforts were made to ensure that MPAs were designed as science-based, stakeholder-driven, and ecologically connected statewide network during the MPA siting process (Gleason et al. 2013; Saarman et al. 2013; see Chapter 1 and Appendix A). To manage California's MPA network, the MLPP is focusing on a variety of management activities to support the MLPP and other legislated goals and requirements in the MLPA, MLMA, and MMAIA. See Table 6 for a summary of roles in MPA management, which together aim to meet the goals and objectives of the MLPA.

Table 6. Overview of MPA management responsibilities and roles to support the MLPP.

Responsibility	Role	Description
Enforcement	Enforcement of Regulations	• Ensure adequate enforcement of MPA regulations to increase compliance • Statutory authority to administer and enforce MPA regulations • Support the Commission through implementation of regulations • Conduct searches, inspections, and has citation authority
Identification of Long-Term Funding Sources	Secure Funding	• Continue to support the pursuit of long-term funding to adequately support MPA management activities into the future
Monitoring, Research, and Evaluation	MPA Monitoring Planning, Reporting, and Review	• Adhere to processes for MPA review and adaptive management, which are inherently linked to monitoring activities (see Chapter 4) • Continue to advance and provide oversight on all aspects of MPA monitoring, research, assessment/evaluation, and reporting to inform adaptive management • Support the Commission by reporting results of research and monitoring • Actively explore how MPAs may be incorporated into fisheries management

[89] FGC §2853(b)(6)

Responsibility	Role	Description
Partnership Coordination	Build and Participate in Partnerships	• Continue to work with the MSLT and explore potential new partnerships throughout the state • Collaborate with State Parks to manage marine parks and MPAs that are offshore of existing coastal State Park units • Engage in other partnership platforms, such as Collaboratives and/or the MPA Collaborative Network
	Integration with Management Efforts	• Actively communicate with other agencies on how MPAs may be incorporated into other management efforts
Outreach and Education	Guidelines and Partnerships	• Continue to work with partners throughout the state to build public awareness and understanding of California's MPA network through outreach, education, communication, and interpretation activities • Set guidelines for outreach materials (e.g., color scheme, messages, etc.) • Improve compliance through education and outreach materials
Permitting	Scientific Collection Permitting	• Maintain a decision framework for issuing SCPs within MPAs
Regulation, Policy, and Decision-Making	Regulatory Support	• Provide advice and information to the Commission to help inform management decisions • Make recommendations on management decisions • Develop rulemaking packages and scoping through the Administrative Procedure Act and Office of Administrative Law • Primary statutory authority for recommending designation of and managing MPAs

3.1 Outreach and Education

Building public awareness through outreach, education, communication, and interpretation efforts (collectively referred to as outreach) is an important component of an effective MLPP. Outreach has been identified as an activity that should be carried out at several levels even when other management activities (e.g., monitoring) are not yet fully implemented. Effective outreach efforts designed to inform potential user groups of MPA regulations and management requirements can have a direct bearing on MPA effectiveness. Increased compliance by an informed public that adheres to specific take regulations allows for MPAs to function in the manner they were designed.

A significant amount of outreach has been accomplished to date by CDFW and partners that include many of the components described in this section. Numerous regulatory guidebooks and brochures have been created and distributed to the public in printed and electronic form throughout the state. Informational kiosks, developed through a collaborative process with agencies and partners, are located in various ports and provide location specific information. A statewide signage project was completed by the MLPP and partners providing interpretive information on MPAs. In addition, no fishing signs were placed near SMRs. Partners and agencies have developed numerous posters, blogs, and videos to help disseminate information to the public about MPAs. CDFW and State Parks have also developed an MPA focused curriculum to incorporate into the Parks Online Resources for Teachers and Students (PORTS) program. To date more than 8,000 students have viewed this module.

While much has been accomplished, there is more to be done. The fundamental tools identified below include: a statewide outreach strategy with regional components, a CDFW guide to developing outreach materials, and staff support for the coordination and review of products developed by

outreach participants. Together, they provide a consistent structure and approach to the development and implementation of MPA outreach materials statewide. This enables all levels of government (federal, state, Tribal, and local), the private sector, NGOs, communities, educators, and stakeholders to work together to provide reliable, efficient, and appropriately focused MPA information to the public. This section describes CDFW's responsibilities regarding MPA outreach and actions the MLPP could take to implement effective outreach.

Outreach Priorities

CDFW, through the MLPP, has the responsibility to provide MPA regulations to the public. Recognizing this responsibility, CDFW's outreach goals are to: increase MPA awareness and understanding, facilitate MPA regulatory compliance, support enforcement, and encourage informed enjoyment and stewardship of MPAs while decreasing unintentional violations. In order to meet these goals, an approach focused on informing users of regulations is CDFW's core function. In this approach to outreach, the initial focus of providing user groups the basic knowledge needed to understand and enjoy MPAs (e.g., locations, boundaries, allowed uses) is an effective measure. It is expected that this approach will support the long-term positive effects of the MPA network, as over time there will be greater voluntary compliance with MPA take regulations.

Additional outreach efforts developed at a more interpretive level, which focus on closely related marine issues and how they interact with and relate to MPAs, would serve to supplement initial regulatory-based outreach efforts. This would allow for a layered outreach approach that uses a variety of actions designed to further increase public understanding and encourage acceptance, while providing incentive for shared stewardship commitments that go beyond the requirements of the law. For achieving its effective outreach and compliance-building goals, the MLPP have prioritized the following actions:

- **Broadly and collaboratively disseminate information:** Continue to distribute information/products to the public through agencies, ocean-related organizations and businesses, and local citizen groups, to improve public understanding of regulations
- **Develop statewide, regional, and local-scale outreach projects:** Statewide and regional outreach efforts can support individual outreach projects by providing information on MPA locations, allowed uses, and benefits; providing localized input on individual MPA signs, panels, and brochures; and helping bring attention to individual MPA habitats and marine resources, conservation objectives, and rules intended to achieve them
- **Encourage community involvement:** Community involvement can help foster compliance, especially when working directly with CDFW enforcement and outreach staff; guidance regarding community and citizen actions can be provided to support effective involvement and accurate messaging in materials development
- **Provide targeted outreach:** Conduct directed outreach as needs arise, adapted to address special compliance and enforcement concerns and address public misconceptions; employ a combination of traditional methods and newer technologies to reach a diversity of audiences
- **Focus interpretive outreach on the purpose of MPAs:** Focus additional outreach efforts on raising understanding about the conservation goals and values identified in the law, the role of MPAs as a tool for effective resource management, and the rationale and objectives for individual MPAs, and raise awareness about the particular habitats and/or species found within the specific location

Approach to MPA Outreach

To achieve the goal of the MLPA to "ensure that the state's MPAs are designed and managed, to the extent possible, as a network,"[90] a statewide MPA outreach strategy should be developed to:

- Identify overarching outreach goals, strategies, general priorities, and standards to apply statewide
- Identify the role of partners and CDFW in outreach and education activities
- Guide the development of regional outreach, interpretation, and education plans that implement the statewide strategy at the regional scale in a manner that supports statewide consistency and coherency.
- Develop regionally-specific outreach plans

Regionally-specific outreach plans for implementing the statewide outreach strategy should be developed as components of Regional MPA Background and Priorities document. Each regional outreach plan may:

- Consider the unique outreach needs of the region and identify appropriate regional approaches
- Identify existing regional programs and assets
- Identify information gaps, priorities, and prospective strategies to fill gaps
- Identify potential partners in the region with specific outreach expertise and capacity

Coordination of Outreach Efforts

Effective regional collaboration and coordination among outreach participants has been found to be helpful for sharing information and experiences, identifying common priorities, and finding collaborative solutions.[91] Therefore, a comprehensive MPA outreach program will utilize CDFW and other MLPP partner resources and build effective outreach partnerships. Directed partner contributions can assist and supplement existing outreach activities, leverage skills, expand resources and expertise beyond those of CDFW, and help to reach new target audiences (see the Partnership Plan for more information).

However, in order for materials developed by outreach participants to effectively serve the public and supplement CDFW efforts, they should adhere to specific product standards and be developed in coordination with CDFW. Product standards developed by CDFW and provided to outreach participants through written and verbal guidance along with a defined product review process will help to ensure accurate messaging, increase regulatory compliance, and ensure the use of biologically accurate information regardless of who developed the product. An MPA outreach program should be established with this in mind and work to provide a central point for coordination of, and responsibility for, activities associated with MPA outreach and its oversight at all levels. This will include the following core actions:

- **Establish structure and procedures for coordination:** Identify processes and associated procedures that facilitate coordination and cooperation between MLPP and other partners

[90] FGC §2853[b][6]
[91] National Marine Protected Area Center. (2014). *Updated Framework for the National System of Marine Protected Areas of the United States*. Retrieved Sept 21, 2015 from http://marineprotectedareas.noaa.gov/pdf/national-system/framework-mpa-oct14.pdf

- **Develop outreach standards:** Develop standards including protocols for outreach information and signage to achieve reliable outcomes both internally and from partners
- **Provide written outreach and partners guide:** Issue outreach standards and guidance in written format as a "Partners Guide." Provide an additional review process to augment the written guide
- **Conduct outreach product oversight and review:** Provide individual guidance, input, and product review where possible, to ensure that partner outreach products are delivered to the public consistent with laws, regulations, policies, standards, and best practices

3.2 Enforcement

The MLPA identified enforcement as one of the chief deficiencies in California's previously existing MPAs. Therefore, the MLPA emphasizes the importance of adequate enforcement as a goal of the MLPP[92] and the inclusion of enforcement measures for all MPAs,[93] and that the Master Plan includes recommendations for improving enforcement. This section describes enforcement objectives for the MPA network and, because CDFW is the primary agency responsible for MPA enforcement, describes CDFW's responsibilities for ongoing MPA enforcement.

Enforcement Plan Objectives

Because the main objective of an MPA enforcement plan is to ensure compliance with regulations, CDFW views outreach and education as a primary tool to support enforcement (see Chapter 3.1). Effective outreach and education of MPA regulations, including MPA boundaries, and the potential benefits of MPAs, builds understanding and buy-in for MPAs and leads people to follow regulations voluntarily, thereby helping alleviate demand on marine resources. In addition to these front-end efforts through outreach and education, compliance is enhanced through on-the-water enforcement efforts such as visible and consistent patrols. Given current CDFW resources, additional enforcement personnel and assets will be needed to effectively enforce the entire MPA network. Increased use of cooperative agreements with other agencies may be a partial solution, but additional funding for enforcement will also be necessary.

Within the primary objective of ensuring compliance with regulations, the objectives of the enforcement plan is comprised of the following categories:

Operational Ability

- Identify areas of high priority, biological sensitivity, or enforcement need (Box 3)
- Determine MPA network enforcement needs
- Hire additional enforcement officers
- Evaluate potential remote observation technology and techniques
- Develop a Records Management System to collect, organize, and track citation information[94]

Box 3. Priority area identification.

Enforcement priorities are developed based on the potential for resource impact, level of use, and potential for violations. High priority areas include habitats that are particularly vulnerable to damage, areas with high aggregations of critical species or species at low abundance, and areas where violations are likely to occur or have occurred at high rates in the past.

[92] FGC 2853(b)(5)
[93] FGC 2853(c)(2)
[94] OPC. (2015). *Marine Protected Area (MPA) Statewide Leadership Team Work Plan FY 15/16-17/18*. Retrieved Sept 21, 2015 from http://www.opc.ca.gov/2015/08/8122/

Cooperative Efforts

- Maintain and enhance cooperative enforcement efforts with allied agencies
- Effectively utilize judicial system resources
- Develop a standardized training program
- Seek and support ongoing and enhanced MOUs

Public Awareness, Outreach, and Education

- Establish an MPA outreach program (see Chapter 3.1)
- Develop outreach materials for enforcement staff to distribute
- Develop standardized signage protocols
- Establish an education advisory board
- Hold public forums to educate specific groups

CDFW Enforcement Responsibilities

CDFW's enforcement staff is charged with enforcing marine resource management laws and regulations over an area encompassing approximately 1,100 miles of coastline out to three nautical miles, resulting in 5,285 square miles of state waters.[95] To do so, CDFW will emphasize patrol of areas of particular concern or at particular risk (see Box 3) and use advanced technology and surveillance systems, to the extent practicable, as called for in the MLPA.

In addition to enforcing MPA laws in state waters, CDFW staff also provide enforcement of federal laws and regulations within state waters as well as federal waters, which extend from three to 200 nautical miles out to sea (the US Exclusive Economic Zone). Enforcement duties include all commercial and sport fishing statutes and regulations, all California Fish and Game Code (FGC) and Title 14, CCR, respectively, marine water pollution incidents, homeland security, and general public safety. General fishing regulations and other restrictions apply within MPAs in addition to MPA-specific restrictions.

CDFW shares jurisdiction for federal regulations including the Magnuson Stevens Fishery Conservation and Management Act, the Endangered Species Act, Marine Mammal Protection Act, the National Marine Sanctuaries Act, and the Lacey Act. A significant portion of both commercial and recreational fishing effort, and subsequently CDFW enforcement effort, occurs in federal waters. Therefore, the existing patrol effort beyond state waters and outside MPAs is important to consider in the plan. How effectively state and federal regulations are enforced within and around the MPAs will affect the MPAs' effect on conserving and protecting marine resources.
Given CDFW's other broad mandates to enforce both state and federal marine resource regulations, current assets are not adequate to redirect to MPA-specific patrols.[96] The increased focus on MPAs suggested by the MLPA and the comprehensive network the act mandates will necessitate not only a detailed enforcement plan, but additional enforcement assets as well (see Appendices C-F, Section 6).

[95] The boundary of state waters for the purposes of the 2016 Master Plan is from mean high tide to three nautical miles offshore of all intertidal rocks and mouths of embayments, including large open bays (excluding state waters in San Francisco Bay, which represent approximately 473 square miles)
[96] Detailed information about existing enforcement assets and personnel can be found in Section 6 of each Regional MPA Background and Priorities document (Appendices C-F)

3.3 Regional MPA Background and Priorities Documents

The 2016 Master Plan focuses on statewide guidance relative to MPA management, and emphasizes the importance of an adaptive and evolving approach to management. In recognition of the science-based and stakeholder driven MPA design and siting processes that led to the completion of California's statewide MPA network (see Appendix A), Regional MPA Background and Priorities documents are included as appendices to the 2016 Master Plan to include region-specific MPA design considerations and priorities moving forward; which together provide important context to base future informed statewide MPA management decisions upon. In the 2008 Master Plan, previous iterations of these documents, then called "regional management plans," were contained in a single appendix.[97] The updated regional MPA Background and Priorities documents include unique regional features and design considerations, regional goals and objectives, summaries of regional MPAs, and regional plans for scientific and enforcement considerations moving forward (Table 7). Regional MPA Background and Priorities documents are not meant to contain specific details for management protocols and methodologies; they instead are intended to be living documents that are readily accessible for reference and adaptive management, and serve as a logical starting place for guiding regionally-based activities. While MPAs are actively managed at the local and regional scales, the MLPP will always consider management from the perspective of the statewide network as a whole, informed by lessons and best practices from finer scales across the state. All regional MPA Background and Priorities documents have a standardized structure and are included as separate appendices, recognizing the varying ecological, social, and economic conditions along California's coast (see Appendices C-F).

Table 7. Overview of Regional MPA Background and Priorities documents' standardized structure.

Section	Description
Introduction	Describes the role of Regional MPA Background and Priorities documents and their relationship to the Master Plan, and provides a brief overview of the information they contain
Description of Region	Provides a description of information unique to the region that is relevant to MPA management
Considerations for Designing Regional MPAs	Describes region-specific goals and objectives, stakeholder priorities and objectives, design considerations, and implementation considerations
Summary of Regional MPAs	Summarizes MPAs in the region, including information on area, along-shore span, depth, primary habitat types, regulations, boundaries, a summary of objectives, detailed objectives, and a map depicting the location
Scientific Information	Describes scientific information relevant to regional MPA management, including information on the regional monitoring plan, with links to the specific baseline and long-term monitoring plans, and a description of and link to a list of species most likely to benefit from MPA protection, which may inform monitoring and evaluation of MPA effectiveness
Enforcement Plan	Includes information pertaining to enforcement challenges and opportunities specific to each MPA, an inventory of personnel and equipment, and current and potential enforcement partnerships

[97] CDFW. (2008). *Draft Master Plan for Marine Protected Areas*. *Appendix O, page O-6*. Retrieved Sept 21, 2015 from https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan

3.4 Aligning MPAs and Other Marine Resource Management Efforts

The MLPP is coordinating to connect MPA science and management with other efforts and activities, such as fisheries, water quality, climate change, and other management efforts as they emerge. As such, collaborative efforts will be crucial for taking an ecosystem-based approach to management, in which managers recognize the numerous interactions within an ecosystem, including humans, instead of focusing on a specific issue, species, or ecosystem service (Christensen et al. 1996). Furthermore, coordination will be essential for planning and carrying out an effective approach to adaptive management.

While CDFW and the Commission retain jurisdiction over the management and take of species within state waters, including within MPAs, the MLPA cannot supersede otherwise lawful activities that are not within the authority of the Commission to regulate.[98] Regulatory agencies should take into consideration the existence of MPAs in their review of the environmental impacts of authorizing a given activity. CDFW may also coordinate with non-regulatory entities such as the OPC and other key partners.

The effort to align MPA management with other marine resource management efforts is largely unprecedented and therefore experimental in nature (see Fox et al. 2013b; Appendix A, Section 3.3: *MPA Design and Management Considerations*). This section shares an overview of how the MLPP is aligning or could align with management of fisheries, water quality, climate change, marine debris, invasive species, which are among some of the most pressing areas for management (Halpern et al. 2009). In addition, this section shares brief summaries of other current and emerging efforts.

Fisheries Management

Overall, while the MLPA calls for by-in-large ecosystem protection,[99] it also envisions integration of MPAs and fishery management.[100] The MLPA states that "MPAs and sound fishery management are complementary components of a comprehensive effort to sustain marine habitats and fisheries"[101] and requires that MPA management be carried out "with the advice, assistance, and involvement of participants in the various fisheries." For example, MPAs can serve as an effective conservation and recovery tool for species at risk, vulnerable species, and species with the greatest conservation need by providing protections for essential fisheries habitat and ecosystems. This connection is further reinforced in California's 2015 State Wildlife Action Plan, which includes linking MPA monitoring as a component of its Data Collection and Analysis conservation strategy.[102] Efforts have been made to align MPAs with fisheries management. For example, CDFW convened a 2011 workshop focused on MPA and fisheries integration[103] to share information and ideas, and OST and CDFW have developed options to better align fisheries monitoring and MPA monitoring through the development of regional MPA monitoring plans.[104,105,106] The MLMA Master Plan for Fisheries is slated to undergo revision by

[98] FGC §2852(d)
[99] FGC §2853(b)(1)
[100] FGC §2851(d). See also FGC 7059(a)(3)
[101] FGC §2850-2863
[102] CDFW. (2015). *State Wildlife Action Plan*. Draft Retrieved Sept 24, 2015 from https://www.wildlife.ca.gov/SWAP
[103] Wertz, S., D. Aseltine-Neilson, T. Barnes, J.Vasques, S. Ashcraft, K. Barsky, A. Frimodig, M. Key, T. Mason, and B. Ota. (2011). *Proceedings of the Marine Protected Areas and Fisheries Integration Workshop*. Retrieved Aug 7, 2015 from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=42306&inline=true
[104] MPA Monitoring Enterprise, OST. (2010). *North Central Coast MPA Monitoring Plan. Appendix A-1: Possible Supplemental Fisheries Monitoring Module*. Retrieved Sept 21, 2015 from http://oceanspaces.org/sites/default/files/regions/files/ncc_monitoring_plan_and_appendices.pdf
[105] MPA Monitoring Enterprise, OST. (2011). *South Coast MPA Monitoring Plan. Appendix A-1: Supplemental Fisheries Monitoring Module*. Retrieved Sept 21, 2015 from http://oceanspaces.org/sites/default/files/regions/files/sc_mpa_monitoring_plan_full.pdf

2017, and represents an opportunity to build upon existing efforts to integrate MPAs and fisheries management.[107]

Water Quality

Water quality is closely tied to the health of California's coastal ecosystems, including within MPAs. Point-source and non-point source pollution lead to harmful algal blooms, human health issues, heavy metal sedimentation, and beach closures, which can have impacts on local coastal economies (Abrahim & Parker 2000; Bay et al. 2003; Anderson et al. 2002; He & He 2008). Aquaculture effluent, once-through cooling from power plants, and brine run-off from desalination plants can also impact water quality.[108] To reduce negative impacts on water quality,[109] the SWRCB, which is named as a managing agency in the MMAIA, sited and implemented State Water Quality Protection Areas (SWQPAs) along the California coast, with the purpose of supporting biodiversity and unique species. These areas are called areas of special biological significance and general protection areas (SWQPA-GP), with SWQPA-GPs being designated specifically to protect water quality within MPAs. In addition, SWRCB amended their California Ocean Plan in 2012 to address the designation of new SWQPAs and MPAs.[110] The regional MPA monitoring plans developed by OST, in partnership with CDFW, include guidance for monitoring of species that are sensitive to water quality and encourage partnerships with existing water quality monitoring programs that maintain and gather water quality data.

Climate Change

MPAs are also linked to marine management efforts related to climate change. CDFW recognizes the effects that climate change has on marine resources[111] and partners on numerous climate change-related projects and issues such as hypoxia, ocean acidification, and the State Wildlife Action Plan process. Although the MLPA does not require consideration of climate change in MPA management, the MLPP recognizes that climate change will likely have an effect on MPAs. At the same time, California's MPAs could potentially help buffer California's marine resources against the negative impacts of climate change by providing areas of reduced pressures exerted on the resources (Micheli et al. 2012). Furthermore, MPAs can act as "living laboratories" to help scientists and decision-makers understand differences in ecosystem responses to climate change both within and outside MPAs. The MLPP is building partnerships with groups that have aligned and complementary expertise and missions regarding the impacts of climate change on California's MPAs in order to ensure coordination and reduce duplication of effort.

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[106] MPA Monitoring Enterprise, OST. (2014). *Central Coast MPA Monitoring Plan. Appendix A: Integrating Fisheries Monitoring and MPA Monitoring*. Retrieved Sept 21, 2015 from http://oceanspaces.org/sites/default/files/regions/files/central_coast_monitoring_plan_final_october2014.pdf

[107] FGC §2851(d); see also FGC §7059(a)(3)

[108] California Environmental Protection Agency. *Ocean Standards: Desalination Facilities and Brine Disposal*. 25 Feb 2015. Retrieved Sept 21, 2015 from http://www.waterboards.ca.gov/water_issues/programs/ocean/desalination/

[109] California Law. *California Water Code*. Division 7: Water Quality. Retrieved Sept 21, 2015 from http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=wat&codebody=&hits=20

[110] SWRCB. (2012). *Water Quality Control Plan – Ocean Waters of California – California Ocean Plan.* Retrieved Sept 21, 2015 from http://www.swrcb.ca.gov/water_issues/programs/ocean/docs/cop2012.pdf

[111] CDFW. *Unity – Integration – Action: CDFW's Approach to Confronting Climate Change*. Retrieved Sept 21, 2015 from http://www.dfg.ca.gov/Climate_and_Energy/Climate_Change/

Marine Debris

Marine debris can lead to mortality of marine life through ingestion, entanglement, and ecosystem alteration.[112] CDFW's Office of Spill Prevention and Response maintains a Marine Wildlife Veterinary Care and Research unit that conducts opportunistic research on marine debris' impacts on marine life and is coordinating with CDFW staff to link MPA and marine debris monitoring (Rosevelt et al. 2013). Additional collaborations to address the impact of marine debris are also occurring with organizations including the University of California Davis, OPC, the SCC, the Northwest Straits Commission, and the National Oceanic and Atmospheric Administration's (NOAA) Marine Debris Program. In addition, beach clean-up programs such as the Coastal Clean-up Day managed by the CCC, while offering only temporary alleviation from marine debris, can help to reduce entry of land- and ocean-based marine debris into the oceans. Current research and monitoring of marine debris may help document the extent to which marine debris impacts MPAs and can help to inform efforts to reduce marine debris within or adjacent to MPAs.

Invasive Species

The impact of aquatic invasive species is not widely understood, especially related to MPAs. MPAs could be effective tools for limiting the spread of invasive species and providing safe harbors for native marine species within their boundaries (Francour et al. 2010). However, there is also some research indicating that invasive species thrive in MPAs, which could thereby undermine the MPAs' integrity (Otero et al. 2013). The MLPP will work to identify opportunities to link MPAs and aquatic invasive species management, both internally and with other agencies responsible for managing invasive species, such as the SLC. In addition, OSPR's Marine Invasive Species Program (MISP) conducts biological monitoring in coastal and estuarine waters to determine the level of invasion by non-native species and works to coordinate with the SLC. CDFW Marine Region staff will work to integrate MPA considerations into future biological monitoring by MISP and help to detect new introductions that may impact MPAs.

Other Marine Management Efforts

In addition to fisheries, water quality, climate change, marine debris, and invasive species, the MLPP may take into consideration the relative impacts of other activities occurring in MPAs when managing the MPA network. This section briefly describes marine management efforts related to these other activities.

- **Non-extractive Uses:** While MPAs can provide opportunities and enhance non-extractive uses of MPAs, such as scuba diving or boating, these uses should be effectively managed to avoid negative impacts caused by overuse beyond the carrying capacity of an MPAs. The MLPP is aware of the potential impact of these uses and will be available to coordinate management of non-extractive uses in MPAs in a way that is consistent with the goals, objectives, and regulations of each individual MPA. Furthermore, the MLPP will take lessons from individual cases and apply them to other sites and the broad network.

[112] United States Environmental Protection Agency. *Marine Debris Impacts.* Retrieved Sept 21, 2015 from http://water.epa.gov/type/oceb/marinedebris/md_impacts.cfm

- **Oil and Gas Drilling and Transport:** There are currently federal and state moratoriums or bans on leasing of offshore areas for oil and gas mining activities.[113,114] However, offshore oil drilling in federal and state waters on existing leases and gas extraction, including hydraulic fracturing, are occurring in federal waters. Therefore, it is important to consider that potential risks from oil or chemical spills could impact MPAs if they were to occur. CDFW and the Commission do not have the authority and are not responsible for managing these operations, but regularly communicate, coordinate, and train with other agencies, including the Bureau of Ocean and Energy Management, SLC, CCC, and the US Coast Guard to ensure that oil spill prevention and response plans consider catastrophic impacts to MPAs. In addition, the MSLT provides another opportunity for state agencies and others to engage in collaborative and cooperative dialogues.
- **Hydrokinetic Power Projects:** California currently has no hydrokinetic power projects, although a past project proposed near Point Cabrillo SMR by Pacific Gas and Electric Company was denied by the Federal Energy Regulatory Commission.[115]
- **Military Exercises (including Naval Sonar):** MPA classifications may not be inconsistent with US military activities deemed mission critical by the US Military (see Appendix A, Section 3.3: *MPA Design and Management Considerations*; Appendix F, Section 3.3; and Fox et al. 2013b).[116,117]
- **Other Forms of Acoustic Pollution:** Regulatory agencies and commissions, such as the CCC, have the authority to protect and oversee coastal uses that may impact MPAs, including seismic imaging for various uses (e.g., oil and gas exploration). The CCC is now beginning to consider the impacts of acoustic pollution on MPAs in their decision-making. For example, the CCC rejected a permit application requesting use of seismic air guns in central California due to potential "damage to marine protected areas."[118] CDFW and the Commission provided consultation on this ruling by raising concerns that there could be impacts on four MPAs within or adjacent to the proposed survey area, based on the project as proposed.[119]

The MLPP will continue to work to determine if and how to link MPA management to these growing or emerging management themes in the future.

[113] PRC §6870 - 6879
[114] Bureau of Ocean and Energy Management. (2012). *Outer Continental Shelf Oil and Gas Leasing Program Final Programmatic EIS.* United States Department of Interior, Bureau of Ocean Energy Management. Retrieved Sept 21, 2015 from http://www.boem.gov/uploadedFiles/BOEM/Oil_and_Gas_Energy_Program/Leasing/Five_Year_Program/2012-2017_Five_Year_Program/01_Introduction_Purpose_Need.pdf
[115] Federal Energy Regulatory Commission (2012). *Order Denying Preliminary Permit Application July 19, 2012.* Retrieved Sept 22, 2015 from http://elibrary.ferc.gov/idmws/file_list.asp?document_id=14039276
[116] PRC §36711
[117] FGC §2863
[118] Dettmer, A. (2012). *Addendum to Staff Report for CDP Application E-12-005 and Consistency Certification CC-027-12, Pacific Gas & Electric Company*. California Coastal Commission. Retrieved Sept 21, 2015 from http://documents.coastal.ca.gov/reports/2012/11/W13b-11-2012.pdf
[119] Ibid.

CHAPTER 4
Monitoring and the Adaptive Management Process

The MLPP is coordinating with partners to develop a process of adaptive management for California's MPA network that helps evaluate whether the MPA network is making progress toward achieving the six goals of the MLPA. This section describes the purpose and objectives of adaptive management of the MLPP; monitoring, research, and development that is used to inform adaptive management; and the process used to carry out adaptive management.

4.1 DEFINING ADAPTIVE MANAGEMENT

Adaptive management, as defined by the MLPA, is a process that seeks to improve management by learning from program actions such as monitoring and evaluation of ecosystem, and management effectiveness (Box 4). Based on this definition, the MLPP will follow a process for adaptive management of California's MPA network.

Box 4. MLPA definition of adaptive management.

The MLPA describes adaptive management as:

"Adaptive management," with regard to marine protected areas, means *a management policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as tools for learning. Actions shall be designed so that, even if they fail, they will provide useful information for future actions, and monitoring and evaluation shall be emphasized so that the interaction of different elements within marine systems may be better understood* (FGC §2852[a]).

CDFW already carries out many activities that fit under the umbrella of adaptive management. For example, in 2014, CDFW proposed and the Commission adopted amendments to clarify complex regulations to improve compliance and enforceability.[120] Soon thereafter, in 2015, CDFW proposed and the Commission adopted amendments to improve boundary accuracy and clarify regulatory language to improve network compliance and enforceability.[121] In the near future, regulatory amendments may also be drafted to address existing and emerging management issues with the network, such as extending Tribal take allowances within MPAs in all the regions.[122] As with any new program, especially of the magnitude of California's MPA network, ongoing regulatory adjustments to align MPAs with their original intent or to address management or enforcement concerns may be warranted. Continued collaboration with partners to inform MPA management, guided in part by the Partnership Plan and MSLT, will support additional partnership-based adaptive management efforts into the future. The adaptive management process (outlined in Chapter 4.5) below will provide a framework for implementing future adaptive management measures.

[120] California Fish and Game Commission. (2014). *Marine Protected Areas Clean Up*. Approved regulatory language: http://www.fgc.ca.gov/regulations/2014/632fregs.pdf; regulations took effect on October 1, 2014

[121] California Fish and Game Commission. (2015). Approved regulatory language: http://www.fgc.ca.gov/regulations/2015/index.aspx#632; regulations took effect on March 1, 2016

[122] CCR, Title 14, Section 632(a)(11) and (b)(1-2, 6, 8-9, 15-16, 20-21, 25, 27)

Purpose of Adaptive Management

The MLPP recognizes that adaptive management is appropriate in cases where there is uncertainty about the impacts of management actions[123] or about the costs and benefits of collecting different types of data and information, as in the case of California's MPAs. Adaptive management can also serve an important role in resource management by providing a framework for responsive change in management measures based on current or emerging stressors. Importantly, the MLPP also views adaptive management as a mechanism for sharing information about the effectiveness of the MPA network in reaching its goals not only with agencies, but also with Californians at large.

Ten-Year Formal MPA Management Reviews

To inform the adaptive management process (see Chapter 4.5), there is the need for a formal review cycle of California's MPA network on a time scale that is biologically appropriate, administratively feasible, and cost effective. Furthermore, the MLPA requires California's MPAs are designed and managed, to the extent possible, as a network.[124] Significant efforts were made to ensure California's MPAs were designed to function as an ecologically connected statewide network (see Appendix A, Boxes 1-3), through four incremental science-based and stakeholder driven regional MPA planning processes resulting in the staggered adoption of MPAs across the state; the Central Coast MPAs in September 2007, North Central Coast MPAs in May 2010, South Coast MPAs in January 2012, and North Coast MPAs in December 2012 (see Chapter 2.2 and Appendix A). Prior to the completion of the statewide MPA network in 2012, the 2008 Master Plan recommended comprehensive reviews of monitoring results to the Commission every five years for each of the four regional MPA networks, in addition to annual reporting on monitoring results, and triennial MPA petition hearings scheduled by the Commission.[125] However, based on the best readily available science and lessons drawn from regional MPA implementation, an ongoing five-year MPA review cycle for incrementally adopted MPAs across four regions is not biologically appropriate or administratively sustainable. The MLPP has therefore set a 10-year cycle of formal management reviews for the statewide MPA network, and is leading the design of a Statewide MPA Monitoring Program, which includes and draws from regional components, to gather sufficient information to evaluate network efficacy and inform the formal 10-year MPA management review (see Chapter 4.3).

The timeframe for the 10-year review is more biologically appropriate, drawing from scientific empirical research and theoretical modeling demonstrating that variables such as biomass, species density, species richness, and size of marine organisms increase with time in no-take reserves (Lester et al. 2009, McCook et al. 2010, Caselle et al. 2015), but may not be realized or easily detected on short timeframes (Babcock et al. 2010, Moffitt et al. 2013, White et al. 2013). This is particularly true in highly dynamic temperate ecosystems such as the California Current and for species such as rockfishes that are long-lived, slow growing, and late to mature (Botsford et al. 2014, Starr et al. 2015). For example, monitoring fish biomass on nearshore rocky reefs in the northern Channel Islands MPAs over the first five years of implementation did not allow enough time to observe dramatic changes,[126] but after 10 years, Caselle et al. (2015) demonstrated that the biomass of target fish species increased consistently inside MPAs. However, monitoring nearshore fishes in Central Coast MPAs over seven years, Starr et

[123] Ballard, A., Birss, H., Botta, R., Cantrell, S., Gonzales, A., Johnson, B., Spautz, H., Torres, S., & Yamamoto, J. (2014). *Incorporation of Adaptive Management into Conservation Planning and Resource Management.* Retrieved Mar 4, 2015 from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=86989&inline=1

[124] FGC §2853(b)(6)

[125] FGC §2861(a)

[126] CDFW, PISCO, CINMS, and Channel Islands National Park. (2008). *Channel Islands Marine Protected Areas First 5 Years of Monitoring: 2003-2008*. Airamé, S. and J. Ugoretz (Eds.). 20 pp. Retrieved Aug 7, 2015 from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=31325&inline=true

al. (2015) determined that 20 years or more may be needed to detect significant changes due to MPA implementation. The timing (i.e., short or long response times), direction (i.e., increase, decrease, or no change), and magnitude of these changes to MPA implementation depends on factors such as MPA age (number of years implemented), size, geography (i.e., whether an MPA is located in southern California versus northern California), and degree of protection (i.e., no-take or limited take), the life history characteristics of target species (i.e., age of maturity, movement, natural mortality rate, lifespan, and larval dispersal pattern), habitat, fishing intensity outside MPAs, and environmental factors such as complex oceanographic patterns or other indirect effects (Babcock et al. 2010, White & Rogers-Bennet 2010, Carr et al. 2011, White et al. 2011, Moffitt et al. 2013; Botsford et al. 2014, Baskett & Barnett 2015, Caselle et al. 2015, Starr et al. 2015, Young & Carr 2015). These interdependent factors may cause difficulty interpreting monitoring data on short timeframes; for example, fished species may slowly increase, decrease, or oscillate immediately after MPA implementation, even when the long-term trajectory would include an increase in abundance (White et al. 2013). In summary, both empirical evidence from California and theoretical modeling affirm the need for long-term monitoring to detect changes that are attributable to MPAs and an appropriately long timeframe, such as every 10 years, for a management review cycle. Monitoring and the ability to detect and adapt to ecological changes is key to track progress and determine whether changes in management are warranted (Lubchenco & Grorud-Colvert 2015, Schindler & Hilborn 2015). Management adjustments should be made with caution to allow sufficient time to effectively evaluate MPA effects before adjustments are made (Gleason et al. 2013, Moffitt et al. 2013).

The formal 10-year management review will emphasize ecological, socioeconomic, and governance aspects of the network and may include, but not be limited to, a scientific evaluation, public scoping meetings, and panel discussions to determine the status, function, and possible changes to the network. The scientific evaluations that inform the formal 10-year management review will encompass multiple elements, including a scientific assessment of ecological and socioeconomic MPA monitoring results (see Chapter 4.3), together with other data streams such as MPA enforcement data. Based on the 10-year reviews, the Commission may take adaptive management actions if data and information support a change. During the adaptive management cycle, the MLPP may also refine and adjust management tools, measures, and strategies based on the management review and progress made toward achieving the specified objectives. Management tools, measures, and strategies fall into four primary categories: 1) MPA Design, including size and spacing; 2) MPA Access, including permitting, take in relevant MPA types, and use; 3) Enforcement; and, 4) Outreach and Education.

4.2 Adaptive Management Objectives

The six goals of the MLPA are inextricably connected and provide guidance for developing management objectives to determine how the MPA network is performing and, ultimately, if the mandates of the MLPA are being met. The MLPA goals recognize the intrinsic value of marine natural heritage for all Californians, including Tribes and Tribal governments, and establishing objectives helps take steps towards protecting these places of importance. This section outlines management objectives to effectively and adaptively manage the MLPP, which includes California's MPA network as well as all state MPA governance and management mechanisms and institutions (for information about the management activities to support the MLPP, see Table 6). Management objectives provide guidance to the MLPP and increase partner and public understanding of MPA management priorities.

These adaptive management objectives are not intended to be comprehensive, nor specific to each of the six goals of the MLPA, but rather to address the goals holistically, inform the design of the Statewide MPA Monitoring Program, and enable the evaluation of MPA network performance towards meeting the goals of the MLPA. Some objectives speak to the MLPA goals at a high level, while others

focus on management tools, measures, and strategies available to support and advance the MLPP. Furthermore, the adaptive management objectives may change during the ongoing adaptive management cycle (see Chapter 4.5). The MLPP will also need to evaluate the objectives in the context of changing ocean conditions and multiple ocean threats, such as climate change, fishing pressure, water quality degradation, marine debris, invasive species, and other existing and emerging issues. As traditional understanding and the components of ecosystem structure (i.e., species and functional groupings) and function (i.e., ecological interactions) may change significantly in the future. Evaluating the effectiveness of the MPA network at achieving the management objectives will need to account for this reality.

Below are the management objectives that the MLPP will address to effectively manage California's MPA network and provide management recommendations to the Commission for the formal 10-year management review, as a part of the adaptive management cycle.

Adaptive Management Objectives:

- Protect the structure and function of marine ecosystems
- Improve native marine life populations, including those of economic value
- Ensure minimal disturbance while allowing for sustainable opportunities for recreation, education and research
- Ensure comprehensive representation of all key habitats, including unique habitats
- Use learning acquired through administration of the MLPP to adaptively manage the objectives, management measures, enforcement efforts, and scientific guidelines to inform management decisions
- MPAs function as a cohesive statewide network

4.3 Statewide MPA Monitoring Program

Knowledge about the efficacy of MPA networks that cover a geographic scale as large as California is limited due to the limited empirical data from large-scale MPA networks (Gaines et al. 2010a, b; Grorud-Colvert et al. 2011, 2014). Therefore, California's MPA network offers a unique testing grounds for collecting data and information to learn about the effects of a large-scale MPA network and inform management (NOAA 2013). Based on scientific findings which suggest relatively long time scales for detecting the effects of MPAs, there is the need for long-term monitoring to gather sufficient information to evaluate network efficacy and inform adaptive management (see Chapter 4.1: *Ten-Year Formal MPA Management Reviews*).

This need is described in the MLPA, which requires "monitoring, research, and evaluation at selected sites to facilitate adaptive management of MPAs and ensure that the [MPA] system meets the goals."[127] Therefore, monitoring results and additional information potentially collected from TK, other scientific data, governance and management review, workshops, and public forums are an accumulation of information that could be used to inform adaptive management which is a response to that information (see Chapter 4.5). The North Coast Regional MPA Baseline Monitoring Program is the first regional MPA baseline monitoring program in California to incorporate a TK research project (see Appendix C,

[127] FGC §2853(c)(3), §2852(a), and §2856(a)(2)(H)

Section 5).[128] The MLPA, together with policy guidance including the Partnership Plan and the MSLT Work Plan, have guided and will continue to guide the MPA monitoring approach outlined in this section, which will be used to inform adaptive management of California's MPA network.

Current Status of MPA Monitoring

CDFW partnered with OST to develop a scientifically rigorous statewide MPA monitoring framework relative to the goals of the MLPA, in the form of regional MPA monitoring plans. Adopted by the Commission as an appendix to the MLPA Master Plan, this framework guides monitoring across the California's MPA network through an ecosystem-based approach. With this approach, monitoring seeks to understand ecosystem condition and trends (including human uses), and to scientifically evaluate MPA design and management decisions. Figure 9 illustrates this high-level, statewide approach to MPA monitoring. Notably, although evaluation activities are distinct from monitoring, evaluation constitutes one of the core components of the monitoring framework, as illustrated in Figure 9. Furthermore, as described in the MLPP adaptive management process (see Chapter 4.5), research and development play important roles throughout the MPA monitoring framework (see Chapter 4.4).

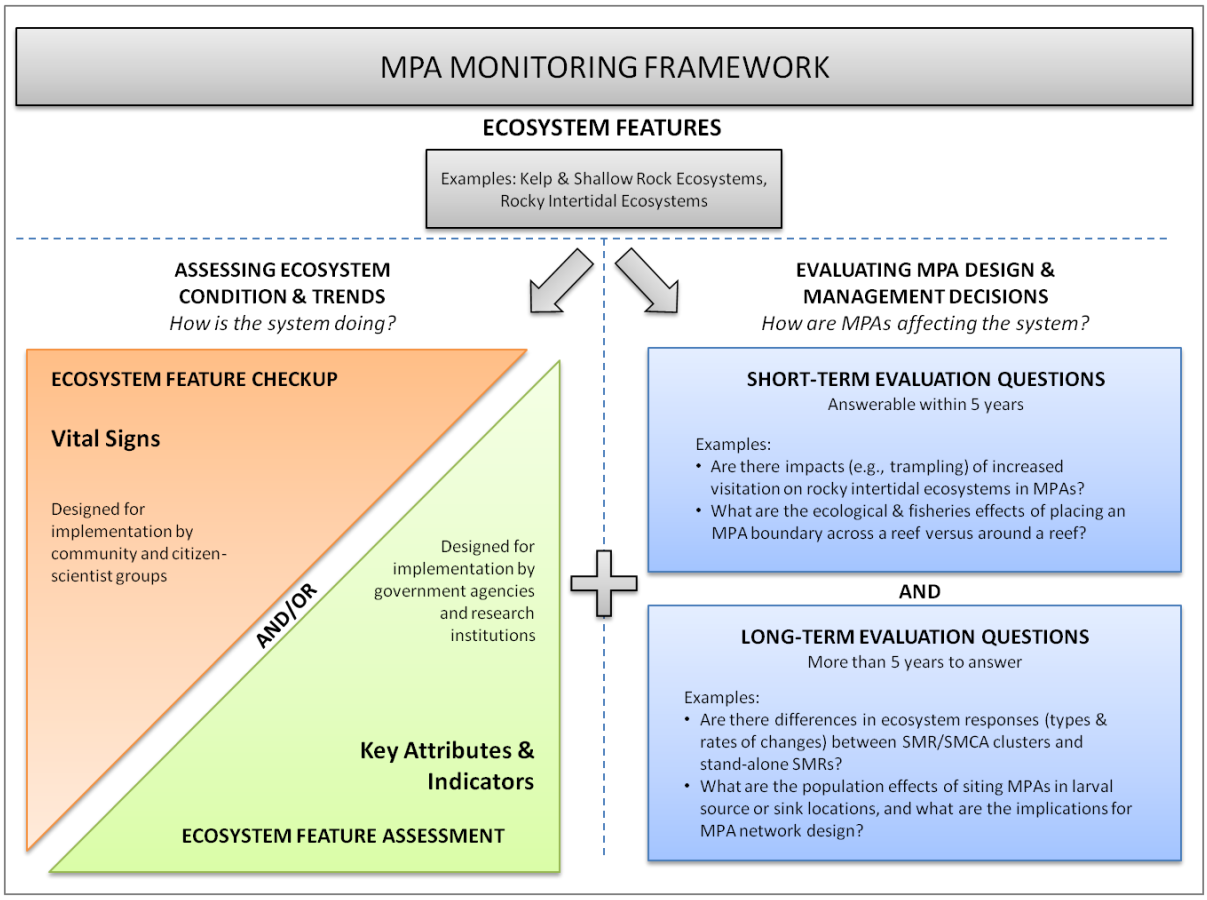

Figure 9. California's statewide MPA monitoring framework.[129]

[128] Rocha, M., Rosales, H., Sundberg, R., and T. Torma. Traditional Ecological Knowledge of Keystone Marine Species and Ecosystems. Retrived Feb 18, 2016 from https://caseagrant.ucd.edu/news/new-projects-to-take-snapshot-of-north-coasts-mpas#keystone-marine-species

[129] MPA Monitoring Enterprise, OST. (2010). *North Central Coast MPA Monitoring Plan*. Retrieved Sept 21, 2015 from http://oceanspaces.org/sites/default/files/regions/files/ncc_monitoring_plan_and_appendices.pdf

To date, the statewide monitoring framework has been used primarily to guide baseline monitoring efforts and has served as the foundation for the development of regional monitoring plans and long-term monitoring needs. Moving forward, it will inform the process of building out a more detailed plan for statewide MPA network monitoring.

CDFW, OST, and OPC have taken significant steps towards establishing a long-term, Statewide MPA Monitoring Program drawing from the existing statewide monitoring framework, regional monitoring plans, findings from the regional MPA baseline monitoring programs, and other related monitoring activities. Figure 10 below illustrates the timeline and milestones of baseline monitoring activities in each region and the first formal 10-year management review, anticipated to take place in 2022. Baseline monitoring will be followed by long-term monitoring across the statewide network, and results from monitoring will inform the formal 10-year management review.

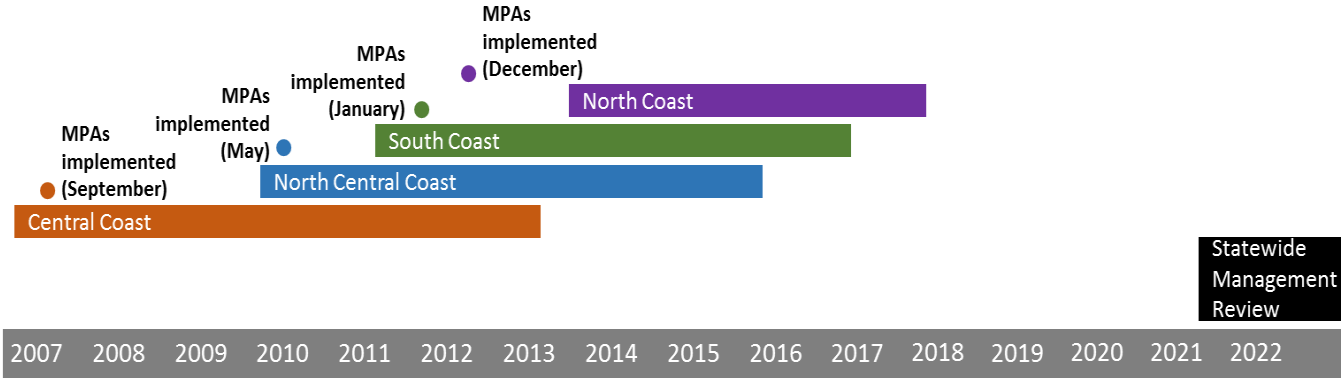

Figure 10. Timeline for baseline regional monitoring and anticipated formal 10-year statewide MPA management review.[130]

Regional monitoring plans have been developed to provide guidance on implementation of both baseline and long-term monitoring (see Appendices C-F, Section 5). The regional monitoring plans align with the statewide MPA monitoring framework while incorporating unique characteristics of each region.

Following MPA planning in each region, baseline monitoring data is collected to inform a five-year management review of the baseline conditions, followed by a transition to long-term monitoring. At the time of development of this document, the Central Coast region is the only region to have completed its baseline data collection and five-year review of baseline conditions. Beginning in 2015, efforts are underway between OST, CDFW, and OPC to develop a long-term MPA monitoring plan which will serve as the first example of an approach to long-term monitoring that can be adapted across regions and scaled towards the entire state (see Chapter 4.3: *Long-Term Monitoring*).

MPA monitoring results will inform the ongoing process of scientific assessment and evaluation, such as interim evaluations and assessments (see Chapter 4.5), and the evaluation and assessment of data and information for Commission consideration in the formal 10-year MPA management reviews. MPA management will therefore evolve over time through adaptive management and based on monitoring results, and MPA monitoring will likewise be adaptive to remain useful and rigorous as science advances and as management needs change.

[130] Adapted from: OST. *MPA Timeline and Milestones.* Retrieved Aug 4, 2015 from http://oceanspaces.org/sites/default/files/mparegiondiagram_v2.pdf

Using a Partnership-Based Approach

The MLPA states that monitoring and evaluation shall take into account existing and planned monitoring and evaluation efforts.[131] Monitoring California's MPA network is not a small task, and thus cannot be carried out by any one agency or organization. Effective, cost-efficient monitoring requires a partnership-based approach that leverages existing capacity across the state and engages the existing wealth of expertise in data collection, analysis and synthesis, and results sharing.

California's approach of establishing a public-private partnership increased the capacity of the state to implement monitoring and builds value and durability for California beyond simply meeting the requirements of the MLPA. To complement the public-private partnership, the Partnership Plan (see Chapter 1) contributes policy guidance for MPA monitoring.[132]

To date, the partnership-based approach to MPA management has involved more than 70 agencies, California Tribes and Tribal governments, and organizations in regional MPA baseline monitoring programs. Long-term monitoring will build on this experience, continuing to leverage capacity and establish partnerships to build a cost-effective, sustainable monitoring program statewide. Incorporating TK can improve the understanding of historical and current ocean conditions. The MSLT has developed an MSLT Work Plan that emphasizes the ongoing need to build partnerships, broaden participation, include knowledge from diverse sources, and build a deeper understanding of ocean health.[133] The MSLT Work Plan reflects the philosophy that all quality science may be useful in building a robust monitoring program, including academic, local, traditional, and citizen science contributions. Citizen science programs provide monitoring support through activities such as trainings to gather biological data in key habitats and recording observations of consumptive and non-consumptive uses of MPAs.

Furthermore, a valuable source of scientific and research expertise lies in California's university systems. California is home to some of the top marine science researchers in the world, and those researchers have an important role to play in enhancing monitoring efforts. These and other top academic institutions can ideally direct their research priorities to align with marine monitoring needs.

Statewide MPA Monitoring

CDFW, OPC, OST, and partners are leading the design of a collaborative process to develop a Statewide MPA Monitoring Program drawing from the existing statewide monitoring framework, regional monitoring plans, findings from the baseline MPA monitoring programs, and other related monitoring activities. The Statewide MPA Monitoring Program will integrate across the existing policy and management responsibilities of multiple state partners to guide a scientifically rigorous, sustainable program that fulfills the mandates of the MLPA and advances California's policy goals for a healthy and productive coast and ocean. Many of the technical and programmatic pieces built during MPA baseline monitoring will readily support this process.

Statewide MPA monitoring is comprised of three interconnected components: 1) scientific network evaluation questions and metrics; 2) regional MPA monitoring; and 3) beyond the MLPA. The first two components satisfy the requirements of the MLPA, and thus take precedence over the third component, which goes beyond the scope of the MLPA. However, the third component may be useful in identifying how MPA monitoring can help inform other state priorities, such as fisheries, water quality,

[131] FGC §2856(a)(2)(H)

[132] OPC. (2014). *The California Collaborative Approach: Marine Protected Areas Partnership Plan*. Retrieved Sept 22, 2015 from http://www.opc.ca.gov/2014/11/ocean-protection-council-meeting-december-2-2014/

[133] OPC. (2015). *Marine Protected Area (MPA) Statewide Leadership Team Work Plan FY 15/16-17/18*. Retrieved Sept 21, 2015 from http://www.opc.ca.gov/2015/08/8122/

climate change, marine debris, and invasive species, thereby driving progress towards a shared vision of a healthy and productive coast and ocean. This component will also play into the adaptive management process, which will help to effectively deploy resources to achieve management goals (Douvere & Ehler 2011; Williams 2011; Steltzenmuller et al. 2012; also see Chapter 4.1).

In summary, network scientific evaluation questions and metrics inform the design of a statewide MPA monitoring plan, and regional MPA monitoring results can, to a large extent, be integrated across regions to inform network-wide evaluation. In the third component, considering the significance of MPAs within the context of other state priorities allows for greater efficiency among ocean management efforts. The three components of the Statewide MPA Monitoring Program inform the formal 10-year management review (see Figure 11) and are described in more detail below.

Scientific Network Evaluation Questions and Metrics

To meet the adaptive management objectives, CDFW, OPC, OST, and partners are committed to developing scientific network evaluation questions and select metrics, based on network-wide objectives (see Chapter 4.2), to inform the development of a statewide MPA monitoring plan. Evaluation questions and metrics within regional monitoring plans provide a starting point for the development of network evaluation questions and metrics, specifically to gain an understanding of ecosystem condition and trends across the state and to assess network performance and thus progress towards MLPA goals.

Like other aspects of MPA management, scientific network evaluation questions and metrics are subject to the process of adaptive management, and therefore may evolve over time. To capture a holistic view of the statewide network performance and effectively guide monitoring, network evaluation questions and metrics will focus on primarily ecological and socioeconomic information. Though the collection of new socioeconomic data is not required by the MLPA, current and future partners who are putting effort toward MPA social sciences, such as economics, management, and governance, can be engaged by incorporating their data into MPA monitoring. For example, as stated in the Partnership Plan, OPC is leading the effort to undertake a management effectiveness evaluation and will utilize data collected from long-term monitoring, including on socioeconomic, management, and governance metrics. This information can feed into the formal 10-year management review. The following are examples of metrics that could be included in the Statewide MPA Monitoring Program:

- **Biological and ecological metrics:** Focal species (commercial and non-commercial) abundance, biomass, size frequency, diversity, and density; biogenic habitat condition; productivity; and/or community structure and composition
- **Socioeconomic metrics:** Governance and management effectiveness, use of marine resources (consumptive and non-consumptive), number of participants in MPA-related activities, geographic patterns of use in and around MPAs, and/or volunteer and community engagement in monitoring and education

Regional MPA Monitoring

Regional monitoring of MPAs helps track progress toward meeting the goals of the MLPA and provides important local-scale results to help inform regulatory and management decisions. Regional MPA monitoring plans are guided by the statewide MPA monitoring framework, and underpinned by the same basic principles and programmatic priorities. Furthermore, the process for building long-term MPA monitoring plans will consider activities across regions as well as the need for connectivity and consistency across the entire state on issues such as site selection. The state has developed a two-phase approach to MPA monitoring in each region: 1) establishing a benchmark through baseline monitoring and 2) long-term monitoring. These two phases are explained in more detail below.

Baseline Monitoring

Data and information collected during baseline monitoring establishes a regional benchmark of the ecological and socioeconomic conditions when each regional MPA network took effect and documents any initial changes resulting from MPA implementation. As such, the baseline serves as an important set of data against which future MPA performance can be measured. Baseline programs have been launched or completed in each of the four coastal MPA regions. These programs are designed, implemented, and coordinated by CDFW, OPC, OST, and CASG. Each regional MPA baseline program is administered near MPA implementation (see Figure 10), and consists of securing funding, establishing a mechanism for disbursing funds, 1-3 years of data collection, data analyses and reporting, disseminating results to as wide an audience as possible, and a five-year monitoring and management review of baseline conditions.

When all baseline programs are completed in 2018 (see Figure 10), California will have an unprecedented understanding of ecological and socioeconomic conditions along the entire California coast. Results from baseline monitoring, all of which are made publicly available through OceanSpaces.org, inform the initial five-year monitoring and management reviews of the regional MPA baseline conditions. In addition, results guide the development of a collaborative, efficient, and cost-effective long-term MPA monitoring program.

The model established through the first regional management review in the Central Coast includes summarizing baseline monitoring results into a five-year 'State of the Region' report shared broadly in advance of the five-year management review. This information can inform the development of management recommendations, including recommendations to continue to improve monitoring and research, education and outreach, enforcement and compliance, and policy and permitting. If management recommendations are identified, they will contribute to the formal 10-year management reviews.

Long-Term Monitoring

Building on existing capacity in the state and guided by regional activities, long-term monitoring will seek to understand conditions and trends of marine populations, habitats, and ecosystems across regions towards a statewide network scale. Planning for long-term monitoring will begin following the completion of the baseline period. Long-term monitoring activities will be designed to provide management decision support within the context of the statewide adaptive management review process.

Long-term MPA monitoring plans will specify monitoring activities for a stated duration based on available funding, partnership opportunities and capacity in the region, and priorities of CDFW and other partners. These documents may include detailed information about recommended budget allocations and funding mechanisms, the specific questions that monitoring should seek to address, design features of ecosystem condition assessments such as temporal frequency and spatial sampling, and incentive structures for encouraging relevant and useful work on the part of organizations and researchers operating in the region.

Not every MPA can be monitored each year, and baseline monitoring results are useful in making strategic choices for long-term monitoring. As directed in the MLPA, long-term monitoring of the MPA network will occur in selected sites. These sites are within the subset of MPAs in the statewide network where the MLPP will focus continued monitoring efforts, and will serve as a frame of reference for assessing the effects of the network as a whole. The process for selecting sites for long-term monitoring will balance rigorous scientific design considerations including local priorities and funding availability, management priorities, and opportunities to align with neighboring regions and advance statewide monitoring priorities. For example, a plan for long-term MPA monitoring may include

prioritization of sites for tracking change in particular ecosystem features and also considers likely monitoring sites in neighboring regions towards a statewide scale.

Beyond the MLPA

California's MPAs compose a network of living laboratories from which we can gain a greater understanding of the effects of existing and emerging stressors and begin to understand how MPAs may improve resilience to various impacts. While long-term MPA network monitoring is primarily informed by the mandated requirements of the MLPA, it is also developed to provide useful information for other aspects of California's ocean resource management, such as fisheries, climate change, marine debris, and invasive species, as well as other existing and emerging marine management efforts. Comprehensive, partnership-based MPA monitoring can help realize the value of the MPA network in aligning with these other ocean issues.

The MLPP can ensure that the adaptive management process provides a responsive framework for changes in management measures by linking statewide MPA monitoring to ocean issues that go beyond the MLPA.

4.4 Research and Development

Progress in science and technology changes what is possible in MPA monitoring and adaptive management. Realizing those possibilities requires engagement with relevant cutting-edge research and innovative development (see Box 5 for an explanation of the difference between monitoring and research). Just as the design and siting process of the MPA network relied on cutting-edge science, long-term monitoring and adaptive management of the network must continue to do so as well.

Box 5. Making the distinction between monitoring and research.

While monitoring and research can be closely linked and inter-related, they can serve distinct purposes for natural resource management. For the purposes of the 2016 Master Plan, monitoring and research are defined as follows:

Monitoring: An ongoing process, sometimes directed by law, of data collection to inform evaluation of changes and progress over time toward goals and objectives. Monitoring can take place on a set of key metrics at representative sites. Consistent monitoring at an appropriate frequency can shed light on the effectiveness of management actions, and this information can inform adaptive management efforts.

Research: Scientific exploration that addresses emerging or otherwise relevant questions that are complementary to the goals and objectives of long-term MPA monitoring. Research questions can be driven by monitoring gaps or findings and feed into monitoring, such as by testing new scientific methods or providing insight on emerging threats that could affect management. Research can provide pure science to continue learning about MPAs, but is not necessary for ongoing monitoring and evaluation.

Given the size and scope of MPAs in California's statewide network, research activities will be needed to gain a better understanding of the underlying biological, chemical, and physical phenomena and human dimensions (such as socioeconomic effects and effectiveness of governance and management measures) relevant to particular MPAs or the network as a whole. Information gleaned from regional and statewide monitoring about a specific ecosystem or metric may raise questions that can only be addressed through a program of focused research. In addition, research will almost certainly make use of the datasets collected through baseline and long-term monitoring. Applied research will be needed to develop new monitoring methods, metrics, modeling approaches, or other analytical methods as needs arise during the adaptive management process.

To complement research, development can play an important role in learning about marine ecosystems and the effects of MPAs. While research can gain information about MPAs through the use of systematic hypothesis testing, development can advance scientific knowledge and technological capacity beyond the scope of traditional research endeavors. This can include the development of new or improved methods and approaches for increasing accuracy, efficiency, and effectiveness of data and information collection. Development can play an important role in supporting research, such as by creating technological solutions that enable researchers to carry out projects more effectively or efficiently. Research can similarly support monitoring; for example, new developments in technology for monitoring ocean chemistry could be implemented to increase monitoring capacity of the MLPP (Boehm et al. 2015).

Existing partnerships, especially with academic institutions including the University of California and California State University can be drawn upon to assess research and monitoring gaps and technological development needs, and identify and carry out focused research programs or development projects to fill those gaps. Funding can provide specific incentives to conduct relevant and useful research and development that includes engagement with natural resource managers and other ocean users.

Through these activities, CDFW, OST, OPC, and state partners will continue to foster the naturally occurring overlap and feedback between monitoring, research, and development and the evaluation and adaptive management processes at the individual MPA, regional, and statewide levels. The results of each of these activities will help ensure that the Statewide MPA Monitoring Program utilizes the best readily available science, as required by the MLPA.

Both research and monitoring, as well as potential development, if unregulated and unchecked, have the potential to have negative impacts on marine environments, such as through collection of specimens. In an effort to prevent negative impacts, CDFW has a process for evaluating and coordinating the permitting of scientific collection activities, as described in Box 6. High-level planning by the MSLT and individual state partners will focus on increasing coordination between permitting agencies.

Box 6. Scientific collection in MPAs.

CDFW uses a decision tree to determine whether to approve or deny SCP requests within MPAs. CDFW reviews proposals for scientific collection and educational activities on an individual, case-by-case basis, but it does not resolve potential cumulative impacts from the effects of multiple activities permitted within an MPA. Therefore, CDFW and OPC's SAT are developing an ecological impact assessment tool to identify potential cumulative impacts prior to issuing an SCP. The ecological impact assessment tool will be used by CDFW to objectively evaluate SCP requests within MPAs.

4.5 Management Review Cycle

The MLPA goals and statutory directives, MPA objectives, and design considerations will serve as the cornerstone for adaptive management actions, in a manner that recognizes the original intent identified through the science-based and stakeholder driven process by which California's MPAs were developed. For example, in recognition that individual MPA goals and objectives are not static, a review of whether an MPA's stated goals and objectives are still relevant or may need to be adjusted is an appropriate adaptive management action.

The adaptive management process for the MLPP is illustrated in Figure 11 below. The process begins with the selection of statewide objectives (step 1 in Figure 11; also see Chapter 4.2) that work toward the goals of the MLPA and other relevant policy and statutes. Informed by the statewide goals and objectives, the MLPP developed and is implementing a program of baseline monitoring for the four regions. After the baseline monitoring period concludes for each region, long-term monitoring, which will be based on the regional and statewide objectives, will begin and continue into the future (step 2 in Figure 11; also see Chapter 4.3). Long-term monitoring results, as well as additional information potentially collected from other scientific data, governance and management review, workshops, and public forums could be used to inform interim evaluation and assessment activities. These activities may take place at the regional scale and serve to inform the public about the state of the network and build understanding and support for the MPAs. These assessments and evaluations can also feed into the formal 10-year management review (step 3 in Figure 11, and this Chapter 4.5).

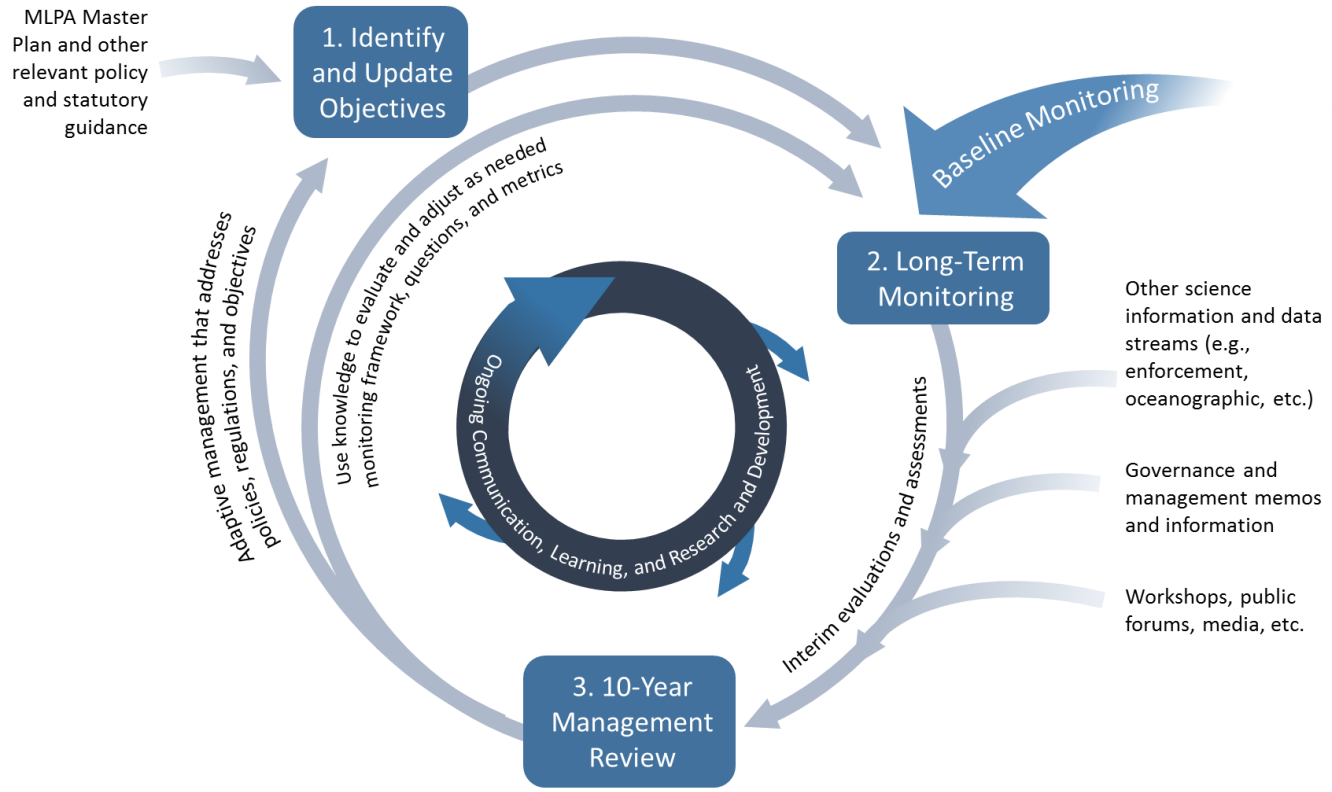

Figure 11. MLPP adaptive management process.

A process for MPA management review is an important component of the adaptive management process. Therefore, the Commission will initiate a formal management review of statewide MPA network performance at least once every decade (step 3 in Figure 11; also see Chapter 4.1: *Ten-Year Formal MPA Management Reviews*). This review will emphasize ecological, socioeconomic, and governance aspects of the network and may include, but not be limited to, a scientific evaluation, public scoping meetings, and panel discussions to determine the status, function, and possible changes to the network. In addition, the Commission receives petitions for the additions, modifications, or deletions of

MPAs on a continual basis,[134] favoring those petitions that are compatible with the goals and guidelines of the MLPA. Meritorious petitions at the discretion of the Commission may be incorporated into the decadal review unless circumstances dictate addressing the petition earlier.[135] Exceptions to the decadal review process may be considered if a petitioner makes a substantial case that not taking immediate action will cause significant harm to public safety or public welfare, or identifies scientific or technical issues that significantly impact MPA management or compromise MPA performance. Based on the findings of the Commission's formal 10-year management review, there may be the need for management actions, such as refining management objectives, policies, and strategies or revising long-term monitoring questions and metrics.

Throughout the entire adaptive management process, there will be the need for learning, communicating lessons, and developing and carrying out targeted research and development projects that can support monitoring and inform adaptive management (see Chapter 4.4). Learning serves an important role in the adaptive management process, specifically by sharing findings with and engaging a broader audience beyond scientists and management bodies. The MLPP can increase public knowledge about California's MPA network by translating and sharing the results of the evaluation, assessment, and review process and providing opportunities for partners to be involved in MPA management. Toward this end, the MLPP can identify and develop platforms for broader learning, which could include workshops, symposia, public forums, or web and print media. In addition to building knowledge, learning can help support the MPA network further by building public interest and compliance with MPA regulations. Increasing the reach of knowledge about the state's MPAs can also lead to new collaborations and partnerships that will build on monitoring and research capabilities. Due to the unprecedented nature of California's MPA network, the MLPP's approach to monitoring, evaluation, and adaptive management is accordingly a pioneering effort that will inevitably lead to significant learning that can help inform future efforts in California, the US, and beyond.

[134] FGC §2861a
[135] CCR, Title 14, Section 660.1

CHAPTER 5
Program Partners and Operations

Operational support as well as adequate funding for CDFW and partners will be crucial for leading effective management of California's MPA network. This section describes the core competencies of partners supporting ongoing management of California's MPA network, potential funding sources that CDFW and its partners could pursue, and the importance of leveraging the human and financial resources of CDFW and partners to achieve sustainable funding.

5.1 PARTNERS AND OPERATIONAL CAPACITY

Building from the roles and responsibilities described in Section 4.2 of the Partnership Plan, the MSLT Work Plan, and the MPA management roles and responsibilities described in Table 6. CDFW can work with partners to identify opportunities that consider jurisdictions and mandates to leverage human resources. Table 8 below provides a brief overview of CDFW's current partners in ongoing MPA management, along with a summary of their core competencies in relation to MPA management.

Table 8. Current partners supporting management of California's MPA network and their core competencies related to MPA management.

Partner	Sample of Core Competencies Related to MPA Management
CDFW[136]	• Marine science design and implementation, including MPA siting and design • Management and enforcement to implement natural resource trustee agency responsibilities including the MLPA • MPA monitoring, research, evaluation, including issuance of scientific collection permits • Outreach and education relating to MPAs
Commission[137]	• Primary regulatory decision-making authority for regulations and rules related to SMRs and SMCAs • Authority and expertise to review MPA proposals and petitions and decide on management actions • Provides venue for public comment and review of the Master Plan
CNRA[138,139]	• Restoration, protection, and management of California natural resources, including terrestrial, coastal, and marine • High-level direction to agencies including CDFW and State Parks • Oversight on state actions regarding ocean resources including through OPC, OST, West Coast Governors' Agreement on Ocean Health, Thank You Ocean Campaign, and Coastal Impact Assistance Program
State Parks[140]	• Management and enforcement of state parks, including terrestrial, coastal, and marine • Designated management agency under the MMAIA, including designation and administration of MMAs • Administration of funds to support grants relating to state parks • Funding generation to support sustainable financing streams for ongoing management of state parks

[136] CDFW. *California Marine Protected Areas*. Retrieved Aug 3, 2015 from https://www.wildlife.ca.gov/Conservation/Marine/MPAs
[137] Commission, *About the Fish and Game Commission*. Retrieved Aug 3, 2015 from http://www.fgc.ca.gov/public/information/
[138] CNRA. *California Natural Resources Agency*. Retrieved Aug 3, 2015 from http://resources.ca.gov/
[139] CNRA. *Oceans*. Retrieved Aug 3, 2015 from http://resources.ca.gov/oceans
[140] State Parks. *About Us.* Retrieved Aug 3, 2015 from http://www.parks.ca.gov/?page_id=91

Partner	Sample of Core Competencies Related to MPA Management
State and Regional Water Boards[141]	• Protection of water quality through setting statewide policy and implementing the Clean Water Act • Expertise and authority to set standards, issue permits such as for waste discharge, determine compliance with permits, and enforce requirements • Compilation of information on surface water, ground water, water rights, and other programs to the public and stakeholders
OPC[142]	• Direction of policy of MPAs to support the California's MPA network • Identification of recommended changes to state and federal law relating to the oceans and coasts • Identification of opportunities to improve efficiency among agencies to achieve their mandated responsibilities including coordination and sharing of scientific data • Engagement of partners and the public through meetings, workshops, public conferences, and leading the coordination of leadership bodies including the MSLT
OST[143,144]	• As a boundary NGO mandated by CORSA, expertise in seeking and providing funds for ocean resource science projects and facilitation of ocean resource science projects and application of science to policy • MPA monitoring program development, design and implementation • Translation of scientific information for multiple audiences
MSLT[145]	• Assurance of communication and collaboration among agencies and partners participating in ongoing management of California's MPA network, including permitting activities • Ensures that team members work together on outreach and education, research and monitoring, enforcement and compliance, and policy and permitting relating to MPAs
SLC[146,147]	• Coastal hazard removal, marine invasive species, marine oil terminals, offshore oil permitting, oil spill prevention, sea level rise, renewable energy • Safe and environmentally sound development, regulation, and management of inland and offshore energy and mineral resources
CCC[148,149]	• Protection, conservation, restoration, and enhancement of environmental and human-based resources of the California coast and ocean • Planning and regulation of the use of land and water in the coastal zone through a permitting process • Implementation of the California Coastal Act
California Environmental Protection Agency[150]	• Restoration, protection, and enhancement of the environment • Environmental health, hazard assessment, toxic substances control, water resources control, emergency response, and enforcement
SCC[151]	• Protection, restoration, and enhancement of coastal resources • Expansion of public access to the shore in partnership with local governments, agencies, non-profits, and private landowners

[141] SWRCB. *California Water Boards*. Retrieved Aug 3, 2015 from http://www.waterboards.ca.gov/publications_forms/publications/factsheets/docs/boardoverview.pdf
[142] OPC. *About the Council.* Retrieved Aug 3, 2015 from http://www.opc.ca.gov/about/
[143] OST. *Our Work*. Retrieved Aug 3, 2015 from http://www.oceansciencetrust.org/work/
[144] OST. *CA Ocean Science Trust Releases Progress Report*. Retrieved Aug 3, 2015 http://www.opc.ca.gov/2013/05/ca-ocean-science-trust-releases-progress-report/
[145] OPC. *Marine Protected Area Statewide Leadership Team.* Retrieved Aug 3, 2015 from http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20150729/Item7-OPC-July2015-MPAStatewideLeadershipTeam-Memo.pdf
[146] SLC. *California State Lands Commission*. Retrieved Aug 3, 2015 from http://www.slc.ca.gov/
[147] SLC. *About the California State Lands Commission*. Retrieved Aug 3, 2015 from http://www.slc.ca.gov/About/About.html
[148] CCC. *About Us.* Retrieved Aug 3, 2015 from http://www.coastal.ca.gov/whoweare.html
[149] Gurish, J. *Overview of California Ocean and Coastal Laws with Reference to the Marine Environmen*t. Prepared for OPC. Retrieved Mar 4, 2015 from http://www.opc.ca.gov/webmaster/ftp/pdf/docs/Documents_Page/Noteworthy/Overview_Ocean_Coastal_Laws.pdf
[150] California Environmental Protection Agency. *About Us.* Retrieved Aug 3, 2015 from http://www.calepa.ca.gov/About/
[151] SCC. *About the Conservancy*. Retrieved Sept 21, 2015 from http://scc.ca.gov/about/

Partner	Sample of Core Competencies Related to MPA Management
	• Distribution of grant funds to improve things like public access to beaches, coastal zone restoration, protection of coastal land, and other issues that help achieve the Conservancy's goals
West Coast Regional Office of National Marine Sanctuaries[152]	• Conduct monitoring and data collection that could inform adaptive management • Maintain authority to patrol, research, inspect, and cite violations of federal regulations (NOAA office of Law Enforcement) • Foster partnerships with State, Tribal, Federal, and non-governmental organizations • Support Joint Enforcement Agreement with CDFW • Provide funding to State to enforce federal regulations in state waters, in federal offshore waters, and in bays, estuaries, rivers, and streams

5.2 Potential Funding Sources

Securing a diversified funding portfolio can help ensure long-term financial stability that is able to withstand future shifts in funding availability. Areas that have been identified as priority gaps in need of support through partners include monitoring, compliance and enforcement, engagement with Collaboratives, and Tribal collaboration and coordination.[153] The 2008 Master Plan contains a list of potential funding sources the MLPA Initiative identified (Appendix N).[154] Building on the list of potential funding sources identified in the MLPA Initiative process, OPC, CDFW, and its partners developed an updated list of potential funding sources in the Partnership Plan[155], including federal, state, and local government; private philanthropy; and the private sector to help cover priority gaps. As funding sources are continuously changing and CDFW is now solidifying its operational needs for MPA management, there is the need to continually reevaluate existing and new potential funding sources.

5.3 Role of Partners in Leveraging Financial and Human Resources

The MLPP depends on collaboration to leverage existing human and financial resources, and CDFW and its partners are committed to working together to identify ways to continue to achieve the goals of the state in an efficient and effective way. CDFW, OPC, RLF, and the Commission have contributed human or financial resources to support MPA management in the past. Additional partnerships could provide more diversified funding on multiple scales and through various sectors, especially in cases where partners have access to funding sources that CDFW cannot tap into itself, such as foundation or other charitable sources. Based on their strengths and abilities, partners from different sectors will have different roles relating to identifying, assessing, and securing various funding sources.

[152] West Coast Regional Office of National Marine Sanctuaries. *About Sanctuaries*. Retrieved Sept 21, 2015 from http://sanctuaries.noaa.gov/about/

[153] See the Partnership Plan for a list of potential funding sources that could provide opportunities for supporting MPA enforcement, monitoring, and outreach.

[154] CDFW. (2008). *Draft Master Plan for Marine Protected Areas. Appendix N: Task Force Memos and Consultants' Report on Options for Funding the MLPA*. Retrieved July 21, 2015 from https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan

[155] OPC. (2014).*The California Collaborative Approach: Marine Protected Areas Partnership Plan*. Retrieved Sept 22, 2015 from http://www.opc.ca.gov/2014/11/ocean-protection-council-meeting-december-2-2014/

CHAPTER 6
Setting a Path Forward

California's MPA network is unique in the world due to its size and coast-wide extent, as well as its strong emphases on science-based design principles and scientifically-informed adaptive management (see Section 2.2 and Appendix A).[156] Therefore, MPA management will involve an adaptive management approach with a continual learning process, which will provide an opportunity from which California and other states and countries can learn. The MLPP will use the adaptive management framework laid out by the MLPA, as well as their experiences in data collection, management, and governance, to address and adapt to new threats and challenges, both environmental and socioeconomic.

To operationalize the elements of the 2016 Master Plan, the MLPP will implement a number of steps to set a course for its core MPA management responsibilities including monitoring and evaluation, enforcement, and outreach and education. The following steps are built from the MPA management responsibilities outlined in Table 6 and will be implemented on either a regional or statewide basis, depending on the scope and focus of the action. Throughout all steps, the overall goal is statewide coordination to achieve effective adaptive management of California's MPA network to meet the goals and objectives of the MLPA. This section details the steps that the MLPP will take to continue to meet the goals and objectives of the MLPA.

6.1 MONITORING, RESEARCH, AND EVALUATION

- **Implement a Statewide MPA Monitoring Plan:** CDFW, OST, and other partners, will develop a statewide monitoring plan to serve as the foundation for assessing MPA network performance. A set of network evaluation questions will also be developed, which will build from the network-wide objectives described in Chapter 4.
- **Update Monitoring Plans:** The MLPP will coordinate to update and adapt regional monitoring plans as necessary based on their learning from long-term monitoring and management actions
- **Report Results:** The MLPP will develop an approach that concisely displays the results of monitoring and evaluation. This approach will be used for communicating the results of California's MPAs to broad audiences.
- **Link MPA and Other Monitoring Efforts:** The MLPP will partner with other monitoring entities, such as state fisheries managers and ocean acidification researchers (e.g., West Coast Governors Alliance and the West Coast Ocean Acidification and Hypoxia Science Panel). These groups can identify data collection that is relevant to MPA monitoring and assist in efforts to integrate that data into MPA monitoring, evaluation, research, and adaptive management.
- **Identify and Support Key MPA Related Research Needs:** The MLPP will identify and support research projects that focus on key science questions, including those related to network functioning as well as the effect of MPAs on fisheries

[156] Ballard, A., Birss, H., Botta, R., Cantrell, S., Gonzales, A., Johnson, B., Spautz, H., Torres, S., & Yamamoto, J. (2014). *Incorporation of Adaptive Management into Conservation Planning and Resource Management.* Retrieved Mar 4, 2015 from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=86989&inline=1

6.2 Enforcement

- **Identify Tools to Support Enforcement:** New and emerging technology options such as remote surveillance, vessel management systems, global positioning system data logger systems, and others may provide options for increased enforcement efficiency. CDFW's Law Enforcement Division would also benefit from a Records Management System as an effective way to collect, organize, and track the vast amount of information that is collected. This will help document CDFW's patrol effort and help identify any geographical or technological areas where changes are needed. Activities associated with research and development can support the identification of these tools.

6.3 Partnership Coordination

- **Build Partnerships:** Through the Partnership Plan and the MSLT, as well as other partnership tools, the MLPP and its constituent partners will renew their commitments to existing, effective partnerships and build new partnerships to help further the MLPP's objectives and fulfill the MLPA mandate. The MLPP will pursue partnerships, such as among local, state, and federal governments, California Tribes and Tribal governments, the University of California and California State University systems, NGOs, the private sector, and citizen science groups.

6.4 Outreach and Education

- **Prioritize Outreach Efforts:** CDFW, in collaboration with partners through the MLPP, will prioritize the key messages, audiences, and communication mechanisms to raise awareness, support, and participation in MPA management. CDFW will also coordinate its outreach with other outside efforts of organizations with aligned priorities.

6.5 Identification of Long-Term Funding Sources

- **Enhance Capacity for MPA Project:** To fulfill its commitment to the MLPP, CDFW established an MPA project under the Habitat Conservation Program. Through the MPA project, CDFW ensures that staff time and resources are allocated to MPA management. However, enhanced capacity will be important to meet the ongoing commitments of the MLPP, and the future needs of California, as the MLPP evolves.
- **Prioritize Potential Funding Sources:** To help secure the resources necessary for continued investment in the MPA network, the MLPP will support OPC and other appropriate partners, including CDFW, to identify the top potential funding sources to fill gaps in financial support for MPA management activities.

Appendices

Appendix A: Marine Protected Area Planning through the Marine Life Protection Act Initiative

Appendix B: Communication and Consultation with California Tribes and Tribal Governments

Appendix C: North Coast: MPA Background and Priorities

Appendix D: North Central Coast: MPA Background and Priorities

Appendix E: Central Coast: MPA Background and Priorities

Appendix F: South Coast: MPA Background and Priorities

Glossary

Abundance: *Natural abundance* is the total number of individuals in a population protected from, or not subjected to, human-induced change (adapted from CDFW 2005a and Kelleher 1992). *Relative abundance* is an index of fish population numbers used to compare populations from year to year (CDFW 2005b).

Adaptive management: With regard to marine protected areas, is a management policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as tools for learning. Actions shall be designed so that, even if they fail, they will provide useful information for future actions, and monitoring and evaluation shall be emphasized so that the interaction of different elements within marine systems may be better understood (FGC §2852[a]).

Biodiversity: A component and measure of ecosystem health and function. It is the number and genetic richness of different individuals found within the population of a species, of populations found within a species range, of different species found within a natural community or ecosystem, and of different communities and ecosystems found within a region (PRC §12220[b]).

Baseline monitoring: Baseline monitoring establishes a regional benchmark of the ecological and socioeconomic conditions when each regional MPA network took effect and documents any initial changes resulting from MPA implementation. As such, the baseline serves as an important set of data against which future MPA performance can be measured.

Biogeographical regions: The following oceanic or near shore areas, seaward from the high tide line or the mouth of coastal rivers, with distinctive biological characteristics, unless the master plan team establishes an alternative set of boundaries (FGC §2852[b]):

1. The area extending south from Point Conception
2. The area between Point Conception and Point Arena
3. The area extending north from Point Arena

Bycatch: In fishing, take of species other than the declared target species.

Deep: Greater than 330 feet (100 meters).

Ecosystem: The physical and climatic features and all the living and dead organisms in an area that are interrelated in the transfer of energy and material, which together produce and maintain a characteristic type of biological community (CDFW 2002).

Habitat: The living place of an organism or community, characterized by its physical or biotic properties (Allaby 1998).

Intrinsic value: The value that that thing has “in itself,” or “for its own sake,” or “as such,” or “in its own right” (Zimmerman 2004).

Marine life reserve: A marine protected area in which all extractive activities, including the taking of marine species, and, at the discretion of the Commission and within the authority of the Commission, other activities that upset the natural ecological functions of the area, are prohibited. While, to the

extent feasible, the area shall be open to the public for managed enjoyment and study, the area shall be maintained to the extent practicable in an undisturbed and unpolluted state" (FGC §2852[d]).

FGC §2860(b) further clarifies permissible activities in "marine life reserves": "Notwithstanding any other provision of this code, the taking of a marine species in a marine life reserve is prohibited for any purpose, including recreational and commercial fishing, except that the Commission may authorize the taking of a marine species for scientific purposes, consistent with the purposes of this chapter, under a scientific collecting permit issued by CDFW."

Marine managed areas: A broad group of named, discrete geographic areas along the coast that protect, conserve, or otherwise manage a variety of resources and uses, including living marine resources, cultural and historical resources, and recreational opportunities (FGC §2852[c], also see PRC §36602[d]).

Marine protected area (MPA): A named, discrete geographic marine or estuarine area seaward of the high tide line or the mouth of a coastal river, including any area of intertidal or subtidal terrain, together with its overlying water and associated flora and fauna that has been designated by law, administrative action, or voter initiative to protect or conserve marine life and habitat. An MPA includes marine life reserves and other areas that allow for specified commercial and recreational activities, including fishing for certain species but not others, fishing with certain practices but not others, and kelp harvesting, provided that these activities are consistent with the objectives of the area and the goals and guidelines of this chapter. MPAs are primarily intended to protect or conserve marine life and habitat, and are therefore a subset of marine managed areas, which are broader groups of named, discrete geographic areas along the coast that protect, conserve, or otherwise manage a variety of resources and uses, including living marine resources, cultural and historical resources, and recreational opportunities (FGC §2852[c], also see PRC §36602[e]).

Natural community: A distinct, identifiable, and recurring association of plants and animals that are ecologically interrelated (FGC §2702[d]).

Natural diversity: The species richness of a community or area when protected from, or not subjected to, human-induced change (drawn from Allaby 1998 and Kelleher 1992).

Shallow: 330 feet (100 meters) or less.

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