

## RECOMMENDATIONS

To guide adaptive management actions regarding the state's MPA Network and Management Program following this Review, CDFW developed a comprehensive list of recommendations in Appendix A from a wide range of sources, including tribes, core partners, the fishing community, the public, and existing reports. Based on this wealth of input and the knowledge gaps identified in this Review, CDFW has streamlined and elevated a suite of recommendations to prioritize for the next decade of the adaptive management cycle (Table 6.1). These recommendations are the culmination of priority needs to advance and improve MPA governance and partnership coordination, program activities under each pillar, and more effective evaluation of MPA Network performance moving into the future.

The CDFW MPA team Sara Worden, Amanda Van Diggelen, Steve Wertz, Michael Prall, Chenchen Shen, and Becky Ota on Catalina Island in 2019—CDFW.



Table 6.1 Adaptive management recommendations and actions to prioritize for the next decade of the adaptive management cycle. Recommendations 1-3 were provided directly by tribes through a report delivered to CDFW to inform this Review (Appendix C).

MPA Governance	Recommendation	Management Actions
<i>Tribal Coordination</i>	<b>1. Improve state agencies' tribal engagement and relationship building efforts.</b>	<ul style="list-style-type: none"> <li>a. Engage in early and frequent communication with California Native American Tribes.</li> <li>b. Have an understanding and respect for tribal decision-making processes.</li> <li>c. Ensure a transparent and accountable process that provides clarity on agency decision-making and the potential for tribes to affect the final decision.</li> </ul>
<i>Tribal Coordination</i>	<b>2. Create a clear pathway to tribal MPA management.</b>	<ul style="list-style-type: none"> <li>a. Recognize tribal people as scientific and cultural practitioners and rightful, equal partners in the development, implementation, and management of MPAs.</li> <li>b. Work with tribes to develop and support co-management programs that can enrich tribal cultural practices and renew traditional values.</li> <li>c. Work with tribes to include and integrate traditional knowledge in MPA management, specifically coastal and marine science.</li> </ul>
<i>Tribal Coordination</i>	<b>3. Build tribal capacity to participate in MPA management activities.</b>	<ul style="list-style-type: none"> <li>a. Provide tribes with adequate resources to participate in changes to the MPA Network and management.</li> <li>b. Better incorporate tribal-led ecological monitoring into the broader MPA Monitoring Program and adaptation of the MPA Monitoring Action Plan.</li> </ul>

MPA Governance	Recommendation	Management Actions
<i>Regulatory and Review Framework</i>	<b>4. Apply what is learned from the first Decadal Management Review to support proposed changes to the MPA Network and Management Program.</b>	<ul style="list-style-type: none"> <li>a. Coordinate with CFGC to evaluate current and future proposed changes to Network design, individual MPAs, and current MPA Management Program priorities and policies in a manner consistent with the findings of this Review (see Appendix A for comprehensive recommendations list and Appendix G for outstanding petitions).</li> <li>b. Identify and utilize best science-based approaches to inform potential changes to the MPA Network in order to enhance Network performance.</li> <li>c. Coordinate with CDFW's legislative office to remove obsolete sections of the Fish and Game Code concerning Marine Life and Fish Refuges to better align with updated designations in the Marine Managed Areas Improvement Act (MMAIA).</li> </ul>
<i>Regulatory and Review Framework</i>	<b>5. Establish targets for meeting the goals of the MLPA and how the Management Program and Network will evolve as targets are met.</b>	<ul style="list-style-type: none"> <li>a. Use results and resources from this first Review, ongoing monitoring, and continued coordination with management partners to develop interim MPA status reports to guide future evaluations.</li> </ul>
<i>Justice, Equity, Diversity, and Inclusion</i>	<b>6. Include and fund more diverse researchers and stakeholders in research and monitoring projects that directly contribute to the MPA Monitoring Program.</b>	<ul style="list-style-type: none"> <li>a. Develop and implement a strategic plan informed by underrepresented and diverse user groups to increase the diversity of community science participants.</li> <li>b. Expand coordination between core monitoring programs and other partners to build trust and merge different types of knowledge with science-based information.</li> <li>c. Explore innovative approaches to engage the fishing industry in MPA research and management.</li> </ul>
<i>Justice, Equity, Diversity, and Inclusion</i>	<b>7. Expand targeted outreach and education materials and events to underrepresented user groups.</b>	<ul style="list-style-type: none"> <li>a. Conduct a language assessment of census blocks within 10 miles of each MPA to translate MPA outreach materials into the top three to five languages used in a household and work on finding new approaches to effectively engage underrepresented audiences.</li> <li>b. Utilize MPA Program partners to target and engage underrepresented user groups in marine conservation.</li> <li>c. Solicit input on customized/targeted outreach materials from members of diverse user groups.</li> </ul>

MPA Governance	Recommendation	Management Actions
<i>Justice, Equity, Diversity, and Inclusion</i>	<b>8. Evaluate the accessibility of MPAs to various community groups.</b>	<ul style="list-style-type: none"> <li>a. Promote novel projects and utilize existing human use datasets to evaluate accessibility of MPAs to different user groups.</li> </ul>
<i>MPA Statewide Leadership Team and Partner Coordination</i>	<b>9. Continue to coordinate and collaborate with OPC and other agencies on California’s ocean and coastal priorities to enhance coastal biodiversity, climate resiliency, human access and use, and a sustainable blue economy.</b>	<ul style="list-style-type: none"> <li>a. Support OPC and partners on the MSLT to prioritize relevant OPC Strategic Plan and MSLT Work Plan objectives. Assess feasibility of current timeframes for taking action and adjust if needed.</li> <li>b. Review and synthesize MPA-focused recommendations and actions outlined in existing state action plans, such as CDFW’s State Wildlife Action Plan, and reports that focus on ocean issues, such as ocean acidification, water quality, and sea level rise.</li> </ul>
<i>MPA Statewide Leadership Team and Partner Coordination</i>	<b>10. Improve partnership coordination across the four pillars of the MPA Management Program.</b>	<ul style="list-style-type: none"> <li>a. Develop and implement a workflow for enhanced coordination between CDFW’s Scientific Collecting Permit Program and other agencies’ permitting requirements.</li> <li>b. Develop strategic plan to strengthen communications between MPA Monitoring Program partners, tribes, and agencies that have overlapping jurisdiction at monitoring sites.</li> <li>c. Strengthen connections and communication between CDFW’s Law Enforcement Division and allied agencies.</li> <li>d. Strengthen cross-border MPA management with West Coast states, Mexico, and Canada.</li> <li>e. Continue to add representatives to the MSLT as partnerships expand.</li> <li>f. Provide partners with consistent MPA messaging and branding for outreach and education activities to support compliance with MPAs.</li> </ul>

<b>MPA Management Program</b>	<b>Recommendation</b>	<b>Management Actions</b>
<i>Research and Monitoring</i>	<b>11. Update the MPA Monitoring Action Plan framework to improve and sustain a cost-effective long-term monitoring program, including guidelines to ensure monitoring consistency and sustainable funding.</b>	<ul style="list-style-type: none"> <li>a. Revisit the MPA site-tiering system and identify more efficient data collection and analysis methods to maximize use of available funding and efficiency without sacrificing scientific rigor.</li> <li>b. Explore more localized and bioregion-specific monitoring strategies.</li> <li>c. Explore CDFW capacity to participate in MPA monitoring to increase long-term program stability.</li> </ul>
<i>Research and Monitoring</i>	<b>12. Invest in improving understanding of the human dimensions of MPAs and develop a human dimensions working group and research agenda.</b>	<ul style="list-style-type: none"> <li>a. Improve collection of demographic data of ocean users and visitors to the California coast.</li> <li>b. Collect participant demographics in volunteer community science and outreach programs and assess participant benefits, motivations, and engagement patterns.</li> <li>c. Conduct more robust studies about compliance with MPA regulations and the impact of outreach and enforcement efforts.</li> <li>d. Conduct a broad economic assessment of the MPA Network on California’s coastal communities.</li> <li>e. Continue to conduct and refine CDFW ocean businesses and public awareness surveys.</li> </ul>
<i>Research and Monitoring</i>	<b>13. Explore the use of innovative technologies such as remote sensing, drones, and eDNA, to enhance and streamline traditional monitoring projects.</b>	<ul style="list-style-type: none"> <li>a. Develop and fund pilot projects to explore novel data collection methods to scale up to regional and statewide monitoring.</li> <li>b. Augment existing monitoring programs to explore new and improved survey methods.</li> </ul>

MPA Management Program	Recommendation	Management Actions
<i>Research and Monitoring</i>	<b>14. Develop a comprehensive community science strategy for MPAs and better utilize community science to supplement core monitoring programs.</b>	<ul style="list-style-type: none"> <li>a. Evaluate the effectiveness and applicability of current community science programs involved in MPA monitoring.</li> <li>b. Create clear frameworks on regional and statewide scales for the intended use of community science from project onset.</li> <li>c. Invest in more centralized data management for community science programs.</li> <li>d. Improve coordination between existing community science programs and identify opportunities for new programs.</li> </ul>
<i>Outreach and Education</i>	<b>15. Evaluate outreach needs, assess effectiveness of resources, and identify and pursue the most impactful and cost-efficient outreach tools for increasing MPA awareness and compliance.</b>	<ul style="list-style-type: none"> <li>a. Conduct gap analysis on CDFW and core partner MPA outreach materials, including multi-lingual products, to identify whether initial objectives are being met and how to improve outreach projects and materials.</li> <li>b. Leverage partnerships to develop projects targeted at closing knowledge gaps in outreach needs.</li> <li>c. Expand the use of mobile apps, digital technologies, and social media to reach wider audiences.</li> <li>d. Improve CDFW website interface to increase accessibility to public information regarding MPAs.</li> </ul>
<i>Outreach and Education</i>	<b>16. Conduct more targeted outreach to specific audiences to connect stakeholders with coastal resources and to encourage stewardship and compliance with regulations.</b>	<ul style="list-style-type: none"> <li>a. Work closely with fishing communities to identify the most effective communication channels and outreach materials for these audiences.</li> <li>b. Increase opportunities for ongoing MPA researcher engagement with the public in forums, science advisory groups, and public presentations.</li> <li>c. Tailor outreach to better serve specific audiences, such as increasing the availability of waterproof materials, pocket-sized MPA maps, digital and online tools, and regionally tailored teacher toolkits.</li> <li>d. Organize an annual public webinar to provide MPA Management Program updates and receive public input.</li> <li>e. Create more regionally focused and culturally informed MPA outreach materials and weave MPA messaging into general ocean content produced by other partners.</li> </ul>

<b>MPA Management Program</b>	<b>Recommendation</b>	<b>Management Actions</b>
<i>Policy and Permitting</i>	<b>17. Improve the application and approval process for scientific collecting permits.</b>	<ul style="list-style-type: none"> <li>a. Improve the SCP online application portal.</li> <li>b. Establish a scientific steering committee to guide improvements to CDFW's environmental impact assessment tool for issuing SCPs within MPAs.</li> <li>c. Increase transparency and communication in the SCP review and issuance process.</li> </ul>
<i>Policy and Permitting</i>	<b>18. Develop a framework to evaluate and approve appropriate restoration and mitigation actions within MPAs and marine managed areas.</b>	<ul style="list-style-type: none"> <li>a. Work with a broad range of partners including state and federal agencies, tribes, the fishing community, and other ocean users to tailor restoration and mitigation projects to regional needs consistent with a statewide restoration and mitigation framework.</li> <li>b. Use statewide policy guidance and best available science to inform restoration and mitigation actions and decisions in MPAs and marine managed areas, such as permitting the removal of invasive species.</li> </ul>
<i>Enforcement and Compliance</i>	<b>19. Create and implement a cohesive and actionable MPA Enforcement Plan.</b>	<ul style="list-style-type: none"> <li>a. Create a standard operating procedure and citing blueprint/authority for use by CDFW's Law Enforcement Division and allied agencies.</li> <li>b. Provide guidance on confirming validity of a SCP for collections occurring in the field and improve communications between patrolling officers and field researchers.</li> <li>c. Identify ways to determine if an MPA requires heightened enforcement efforts using existing RMS data.</li> <li>d. Identify outreach materials enforcement officers most need when contacting individuals in the field.</li> <li>e. Identify potential alternative deterrents to MPA poaching for misdemeanor offenses and/or repeat offenders (example: possible MPA school prior to license renewal).</li> </ul>

<b>MPA Management Program</b>	<b>Recommendation</b>	<b>Management Actions</b>
<i>Enforcement and Compliance</i>	<b>20. Increase enforcement capacity.</b>	<ul style="list-style-type: none"> <li>a. Continue MPA-focused training for CDFW Wildlife Officers and allied agency partners.</li> <li>b. Assess needs for new equipment, such as replacing older patrol boats, and increased patrols in violation hotspots and across the coast.</li> <li>c. Explore utilizing technologies that could assist with enforcement cases and evidence-gathering in more remote locations.</li> </ul>
<i>Enforcement and Compliance</i>	<b>21. Enhance MPA citation record keeping and data management.</b>	<ul style="list-style-type: none"> <li>a. Identify enforcement gaps and violation hotspots for inclusion in enforcement plan and finalize manual data entry of any citations not yet entered into the database from before 2016, as well as citations from 2021 through May 2022.</li> <li>b. Track MPA patrol hours alongside the number of contacts, warnings, and citations in one database.</li> <li>c. Identify efficient ways to track repeat offenders when out in the field.</li> <li>d. Use enforcement data to inform outreach and education efforts, and better link enforcement data with human dimensions and ecological monitoring data.</li> <li>e. Develop a standardized MPA compliance report card to share with the public and decision makers.</li> </ul>
<i>Enforcement and Compliance</i>	<b>22. Increase information gathering regarding MPA violation prosecutions and judicial outcomes.</b>	<ul style="list-style-type: none"> <li>a. Track prosecution outcomes to better understand how fines may vary by county for similar offenses.</li> <li>b. Encourage MPA and marine resource outreach to district attorneys and judges to highlight importance of resource prosecution.</li> </ul>

MPA Network Performance	Recommendation	Management Actions
<i>MPA Network Design</i>	<b>23. Expand and target monitoring and research efforts to examine the design attributes of the MPA Network more effectively.</b>	<ul style="list-style-type: none"> <li>a. Tailor data collection and analyses to address the effects of specific MPA attributes such as size, spacing, and levels of protection on monitored species, habitats, and human communities.</li> <li>b. Continue to utilize and refine network connectivity models to assess MPA contributions to ecosystems, populations, and fisheries.</li> <li>c. Prioritize studies and data analyses that continue to address the benefits of implementing a connected network of MPAs on ecological and human communities in California.</li> </ul>
<i>MPA Network Design</i>	<b>24. Work with CFGC and partners to better incorporate marine cultural heritage into the design of the MPA Network.</b>	<ul style="list-style-type: none"> <li>a. Develop a process to incorporate state marine cultural preservation areas (MMAIA section 36700(6)(d)) into existing MPAs and new locations across the Network.</li> <li>b. Define metrics for identifying culturally important objects and sites to recommend for potential protection.</li> </ul>
<i>Climate Resilience and Adaptation</i>	<b>25. Develop and implement climate change research and monitoring priorities and metrics for California's MPA Network.</b>	<ul style="list-style-type: none"> <li>a. Develop models for climate change risk on shorter timescales and for both nearshore and deep-water marine species and habitats. Better incorporate tribal-led ecological monitoring into the broader MPA Monitoring Program and adaptation of the MPA Monitoring Action Plan.</li> <li>b. Investigate resilience conferred by MPAs by adding new climate resilience monitoring metrics to the MPA Monitoring Action Plan.</li> <li>c. Work with CDFW Science Institute's Climate Change Focus Team to better incorporate climate-focused MPA monitoring into broader state climate change targets.</li> </ul>
<i>Climate Resilience and Adaptation</i>	<b>26. Consider climate change impacts from the outset of planning for monitoring MPA human dimensions.</b>	<ul style="list-style-type: none"> <li>a. Leverage planned OPC Science Advisory Team human dimensions working group to identify social and economic service provision of MPAs and intersections with climate change.</li> <li>b. Assess equity issues around MPAs in a changing climate.</li> </ul>

MPA Network Performance	Recommendation	Management Actions
<p><i>Fisheries Integration and Other Influencing Factors</i></p>	<p><b>27. Improve understanding of MPA Network effects on fisheries and fish stock sustainability and further integrate MPA monitoring data into fisheries management.</b></p>	<ul style="list-style-type: none"> <li>a. Improve data sharing and integration between MPA and fisheries-focused management programs.</li> <li>b. Explore tools to capture spatially explicit metrics of fishing catch and effort that are more appropriate for MPAs in California.</li> </ul>
<p><i>Fisheries Integration and Other Influencing Factors</i></p>	<p><b>28. Further integrate influencing factors into ecological and human study designs and interpretations of MPA performance.</b></p>	<ul style="list-style-type: none"> <li>a. Improve estimates of other anthropogenic metrics such as visitation, enforcement presence, other regulatory management actions, and water quality.</li> </ul>