



State of
California
Coast and
Ocean
Annual
Report
2021



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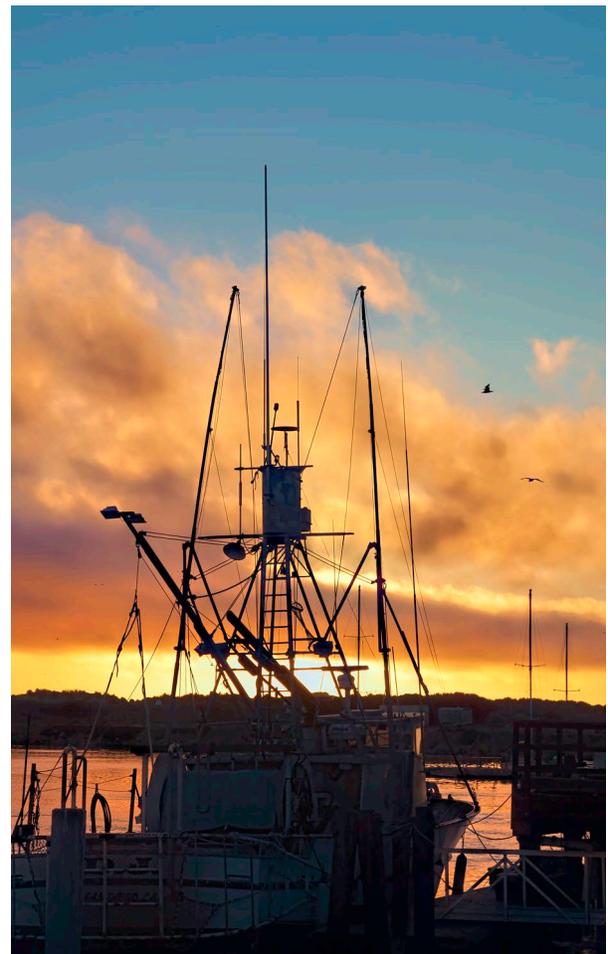
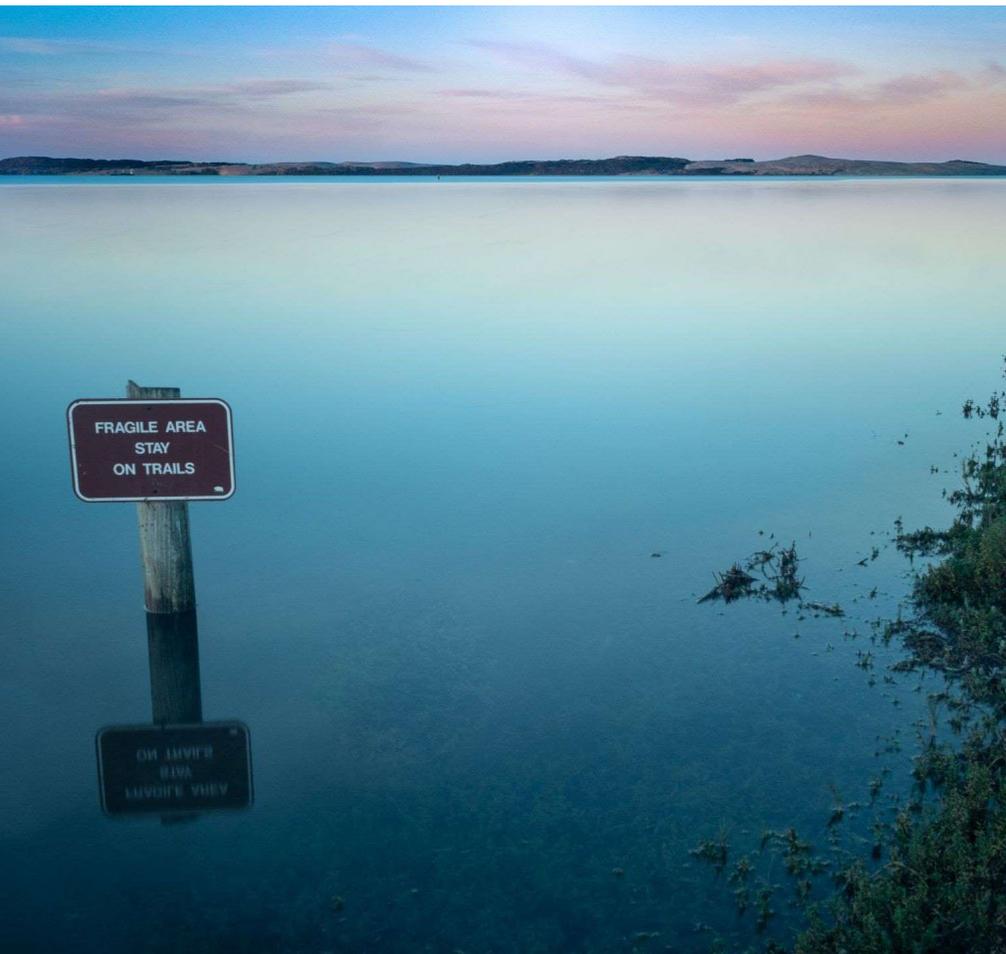
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INTRODUCTION

This California State of the Coast and Ocean Annual Report¹ highlights progress on [Strategic Plan](#) implementation and critical issues in 2021. Future reports will include a snapshot of the health and resilience of California's coastal and marine ecosystems in addition to continued progress towards the Strategic Plan goals. An assessment of the state of the coast and ocean will be based on biological, physical and chemical indicators to identify status and trends of biodiversity, water quality, and access, providing the public and decisionmakers with a clear understanding of the condition of California's ocean and helping prioritize future investments and action.

Despite challenges presented by the ongoing COVID-19 pandemic, the Ocean Protection Council (OPC) advanced efforts across all four goals in our Strategic Plan, spearheading critical policy initiatives and investing millions of dollars in projects that build coastal resilience, increase biodiversity, promote environmental justice within our work and support the blue economy.

In 2021, California made its most significant investment to date in coastal resilience with \$500 million committed to the State Coastal Conservancy for resiliency projects like wetlands and living shorelines, \$30 million to the Coastal Commission for working with local government on Sea Level Rise Planning efforts and \$11.5 million to State Parks for sea level rise planning and resilience implementation efforts. OPC led efforts to develop a workplan to implement sea level rise adaptation principles and allocated over \$8 million for coastal resilience projects, while Senate Pro Tem Atkins authored a comprehensive sea level rise adaptation and planning bill that Governor Newsom signed into law. OPC, the California Department of Fish and Wildlife (CDFW) and California Sea Grant made major investments in kelp restoration research: an urgent need due to marine heat wave-triggered ecological collapse of kelp forests on the North Coast. 2021 was a year that saw enormous investments in statewide ocean acidification and hypoxia (OAH) monitoring and even greater investments in understanding OAH impacts on marine life will be made in early 2022. We've seen progress in the creation of a statewide coastal harmful algal bloom network that will soon have predictive water quality capabilities. The California Fish and Game Commission (FGC), CDFW, and OPC efforts on protecting marine life were highlighted by continued implementation of the Dungeness Crab Risk Assessment and Mitigation Program, the buyout of remaining drift gillnets, funding for better predictive modeling on the location of endangered whales and leatherback turtles off the California coast, and working with leading marine scientists to develop recommendations for the Marine Protected Area (MPA) network decadal management review and for making the MPA network more climate resilient.

Although we had incredible success this year, there remains an imperative need for increased action. The [latest report](#) from the Intergovernmental Panel on Climate Change (IPCC), released in August 2021, affirmed the dire state of the global climate, with unprecedented increases in warming and sea level rise, among other impacts. The pace of climate change impacts is far exceeding our current capacity to adapt quickly enough to protect coastal and ocean ecosystems and shoreline development. The United Nations Secretary-General referred to the report as a "code red for humanity."

¹ As required in Target 3.6.1 of the Ocean Protection Council's Strategic Plan to Protect California's Coast and Ocean

Sea level rise, increased storms and erosion, ocean acidification, and marine heat waves are already impacting California's coast and ocean with devastating consequences for ecosystems, coastal economies, and public access. OPC has already prioritized climate resilience in our Strategic Plan, but the impacts we are seeing today – and the projected intensification of those impacts – are amplifying our need to take bold and transformational action now.

Looking ahead to 2022, we anticipate doubling down on efforts to identify, innovate and implement ambitious climate adaptation solutions to protect California's coast and ocean by relying on the expertise of scientists, Tribes, communities, and agency partners throughout the state, and investing the significant coastal resilience funding included in the Governor's 2021-2022 State Budget.



2021 Legislative Session

After the COVID-19 pandemic necessitated a sparse legislative year in 2020, 2021 proved to be productive in terms of ocean and coastal protection:

SB 1 (Atkins), the Sea Level Rise Mitigation and Adaptation Act of 2021, provides tools and resources for communities to address the impacts of sea level rise. Specifically, SB 1 directs the California Coastal Commission to take sea level rise into account in its planning, policies and activities. It establishes the Sea Level Rise State and Regional Support Collaborative within OPC to provide technical assistance and funding for local and regional governments to plan and implement adaptation actions. The bill also provides additional funding for the California Environmental Protection Agency's Environmental Justice Small Grants Program to help communities entitled to environmental justice address and mitigate the impacts of sea level rise.

SB 72 (Petrie-Norris), the Coastal Adaptation Permitting Act of 2021, aligns with CRNA's "Cutting the Green Tape" initiative by establishing a more coordinated and efficient regulatory review and permitting process for coastal adaptation projects along the California coast. This will enable imperative sea level rise adaptation efforts to be implemented more rapidly, offering greater opportunities to preserve California's beaches and bluffs from climate change consequences.

AB 525 (Chiu) assists in California's transition to clean energy by requiring the California Energy Commission (CEC) to establish megawatt offshore wind (OSW) planning goals for 2030 and 2045 by June 1, 2022. The bill further requires the CEC, in coordination with specified agencies (including OPC), to develop a Strategic Plan that includes evaluation of impacts on environmental and cultural resources and fishing from OSW development. This plan must be submitted to CNRA and the Legislature by June 30, 2023.

AB 881 (Gonzalez) closes an existing loophole in California law by requiring that mixed plastic waste exports out of the country be counted as "disposal" rather than "recycling." Historically, a large percentage of plastics from California labeled as "recycling" have been shipped overseas where they actually end up burned, dumped, or landfilled. By reclassifying the export of mixed plastic waste as "disposal," this bill will ensure that only truly recyclable plastic counts toward statewide recycling and diversion goals.

AB 1276 (Carrillo) prohibits a food facility or third-party food delivery platform from providing single-use food service ware accessories to a consumer, unless requested by the consumer, thereby helping to reduce single-use plastic waste into the environment.

SB 433 (Allen) enables the California Coastal Commission to better protect the state's coastal resources and recreational opportunities by expanding the agency's administrative penalty authority; the threat of monetary penalties has proven to be the single most effective tool for quickly and cost-effectively resolving violations without litigation. By giving the Commission the same tools for permit violations and unpermitted damage to wetlands, sensitive habitat, or coastal waters, this bill serves to deter potential violators from illegal behavior and encourage existing violators to remedy damages to our shared coastal resources more quickly

ACCOMPLISHMENTS THAT ADVANCE STRATEGIC PLAN GOALS

GOAL 1: SAFEGUARD COASTAL AND MARINE ECOSYSTEMS AND COMMUNITIES IN THE FACE OF CLIMATE CHANGE

Objective 1.1: Build Resilience to Sea Level Rise, Coastal Storms, Erosion and Flooding

State Sea Level Rise (SLR) Leadership Team: After the release of the [2020 Principles for Aligned for State Action](#), the SLR Leadership Team Executive Committee tasked programmatic staff on its Working five-year implementation guide for achieving coastal resilience. OPC facilitated six working group meetings, 11 one-on-one agency meetings, and numerous follow-ups to create the first draft of the SLR Work Plan. Currently in its final comment period, it will be presented for approval by the Executive Committee in December 2021 and will be shared publicly at the February 2022 OPC meeting. The Work Plan will integrate recent efforts including the Coastal Commission's [SLR Guidance for Critical Infrastructure](#), California State Park's [SLR Adaptation Strategy](#), San Francisco Bay Conservation and Development Commission's Regional Planning Strategy: [Bay Adapt Joint Platform](#), and State Lands Commission's [SLR assessments on public trust lands](#), including ports, as required by AB 691.

SLR Awareness Campaign: OPC co-led the creation of a sea level rise awareness campaign, [The Ocean Is Moving In](#). The campaign takes a playful approach to communicating the threat and impacts of sea level rise – “The ocean is moving in” – in the form of human-sized marine creatures taking over the shower, kitchen, couch, hot tub, etc. The campaign includes a social media toolkit shared with partner agencies and organizations, and features videos that direct audiences to [sealevelrise.ca.org](#), a CNRA-hosted sea level rise information website full of facts, challenges, case studies and solutions.

Proposition 68 Coastal Resilience Investments: At the February 2021 Council meeting, OPC approved the disbursement of \$8 million for [Prop 68 funding for 15 coastal resilience projects](#).

These projects advance statewide coastal resilience through sea level rise adaptation and restoration of coastal habitats. Projects were featured in the 18-episode [Prop 68 Climate Resilience Miniseries](#) led by 2021 California Sea Grant State Fellow, Dr. Kathryn Beheshti. The intent of the miniseries was to: 1) highlight the collaborative and interdisciplinary work that resulted from the Prop 68 funds; and 2) effectively communicate to all Californians how voter support for Prop 68 has advanced the state's efforts to protect and restore critical wetland habitat, use nature-based solutions to protect our developed shoreline, and improve coastal access and safety.



In 2021, the State Coastal Conservancy authorized funding to advance watershed and coastal habitat restoration including an estimated: 5,600 acres of tidal wetlands and uplands; 69 acres of riparian habitat; 22 acres of subtidal habitat; and 3 acres of dune restoration. Investments also included land conservation of over 15,000 acres to preserve fish and wildlife habitat and public access.

Objective 1.2: Minimize Causes and Impacts of Ocean Acidification and Hypoxia

OAH Monitoring and Research: The California coast is vulnerable to OAH phenomena driven by global climate change. The intensification of OAH will increasingly put California's productive, rich, and commercially important marine life at risk. OPC made significant investments in OAH monitoring and research to support rigorous, managerially relevant research and monitoring on current and projected impacts of ocean acidification and hypoxia. At the June 2021 Council Meeting, [OPC approved funding](#) to Scripps Institute of Oceanography, Southern California Coastal Water Research Project, and the Central and Northern California Ocean Observing System to advance biological and chemical monitoring through coordination and standardization across the monitoring programs with the intent of catalyzing a statewide OAH monitoring effort. Additionally, OPC, in partnership with California Sea Grant, and in coordination with the State Water Resources Control Board, is leading a Prop 68 OAH solicitation to further support monitoring, research, and synthesis efforts.

Climate Resilience Funding: Governor Newsom's 2021-2022 State Budget included unprecedented funding for climate adaptation efforts. Coastal wetlands and coastal resilience were highlighted as priority investments. Funding allocations included:

- \$30M to the California Coastal Commission for SLR planning with local governments through Local Coastal Program updates
- \$500M to the State Coastal Conservancy for wetland restoration and other coastal resilience projects that prioritize nature-based solutions
- \$11.5M to State Parks to implement its SLR Adaptation Strategy
- \$22M to various agencies for the Fifth Climate Assessment
- \$100M to OPC for ocean and coastal resilience actions and research



GOAL 2: ADVANCE EQUITY ACROSS OCEAN AND COASTAL POLICIES AND ACTIONS

Objective 2.1: Enhance Engagement with Tribes

Tribal Marine Stewards Network: In 2020, OPC supported the launch of the [Tribal Marine Stewards Network pilot program](#), composed of four partner Tribes (Tolowa Dee-ni' Nation, Resighini Rancheria, Kashia Band of Pomo Indians, and the Amah Mutsun Tribal Band) and supported by two nongovernmental organizations (California Indian Environmental Alliance and Ecotrust). Modeled after successful indigenous monitoring programs in other parts of the world, the Tribal Marine Stewards Network aims to empower coastal Tribes in California to monitor, protect, and restore the cultural and natural resources of their territories. Over the last year, despite significant challenges posed by the COVID-19 pandemic, partner Tribes have initiated monitoring and outreach projects focusing on MPAs located within Tribal territories, with the ultimate goal of supporting co-management of MPAs.

These projects include: assessment and stewardship of culturally important places that may be impacted by sea level rise and coastal erosion; monitoring of culturally important species such as sea stars, night smelt, and surf smelt; monitoring of critical habitats (e.g. 3D imaging of rocky intertidal zones, surveys of human uses in sandy beach habitat, drone surveys of kelp canopy, water quality and eDNA sampling); applying indigenous traditional knowledge to coastal and

ocean stewardship; and outreach to Tribal communities, including opportunities for Tribal youth to visit coastal habitats and gain hands-on experience with research and monitoring.

The early success of the Tribal Marine Stewards Network led the Packard Foundation to commit an additional \$500,000 to the program earlier this year, supplementing OPC's initial investment of \$1,000,000. Partner Tribes have also begun to focus on potential approaches to growing the scope and scale of the Network and including more Tribes.

Tribal Engagement Strategy: OPC is seeking to consult and collaborate with California's Tribes and Tribal Governments on the development of a bold and transformative Tribal Engagement Strategy, which will provide a framework for enhanced partnership between OPC and Tribes on ocean and coastal matters. This year, OPC engaged more than 10 coastal Tribes through consultations and listening sessions aimed at improving understanding of Tribes' perspectives on two key issues: best practices for conducting outreach and engaging with Tribes in a respectful and effective manner, and Tribes' priorities for coastal and ocean conservation and management.



Outcomes of these consultations and listening sessions will inform the development of a draft Tribal Engagement Strategy. Potential components of the Strategy could include: guiding principles and values; an OPC-specific consultation policy; best practices for communication and collaboration; opportunities for financial assistance; and specific focus areas for partnership based on Tribal priorities (e.g., indigenous traditional knowledge, land return, co-management, and climate resilience). OPC will conduct additional outreach and provide further opportunities for consultation once the draft Strategy is developed, with the goal of bringing a final Strategy to the Council for consideration and possible adoption in mid-2022.

Objective 2.2: Enhance Engagement with Underserved Communities

Working Through the Lens of Equity: Led by Dr. Kikanza Nuri-Robins, OPC staff completed a ten session, 30-hour Diversity, Equity and Inclusion training program that was developed specifically for OPC to improve inward and outward-facing efforts to advance equity. The program connected the principles of cultural proficiency to the values and vision of OPC, and explored intersections, barriers and bridges to our work. It provided strategies for building diversity, equity and inclusion into all the work of the Council and is informing the development of OPC's first-ever Equity Plan.

Equity Plan: This year, OPC embarked on a process to develop our Equity Plan, which aims to advance more equitable and comprehensive ocean and coastal science research, policies, programs and projects that reflect the connection between people, communities, and natural systems. OPC is committed to adopting and implementing a Plan that will promote environmental justice (EJ), equity, diversity and inclusion, both in its internal operations and its work with and for the public.

Plan development is being informed by an [Environmental Justice \(EJ\) Advisory Group](#) comprised of community leaders and advocates representative of California's diverse regions. In addition to providing feedback on plan components, the EJ Advisory Group members will also help solicit feedback on the draft when it is released for public review. OPC anticipates bringing the final Equity Plan to the Council for consideration and possible adoption in mid-2022.

Proposition 1: Coastal Environmental Justice Solicitation: In an effort to develop an approach that ensures underserved communities are prioritized to receive an equitable proportion of funding for habitat restoration and protection projects, OPC developed a new Coastal Environmental Justice Solicitation using the remaining \$7.5 million of OPC's Proposition (Prop) 1 funds. OPC staff released the Coastal Environmental Justice Solicitation in March 2021 calling for coastal projects that benefit communities entitled to environmental justice and improve water quality through restoration, habitat enhancement and resilience to climate change. Communities included: the state-defined disadvantaged and severely disadvantaged communities, California Native Tribes and Tribal Governments, and communities that score above 80% on CalEnviroScreen results. OPC also prioritized advancing projects that are led by community-based organizations.

This solicitation is OPC's first step in accomplishing a dedicated pathway for funding EJ communities and projects delivering meaningful benefits for those communities, in both providing direct short-term and long-term benefits. OPC staff offered multiple technical assistance opportunities to provide guidance during proposal development and encouraged applicants to develop strong engagement strategies that emphasize social and economic benefits for Communities, such as employment opportunities, wealth-generating pathways, building community capacity, and engagement in every phase of the project. These are elements that OPC is working to incorporate into other funding opportunities to ensure community benefits are meaningful and can be achieved through OPC projects and programs. Final recommended projects for this solicitation are being brought to the December 2021 Council meeting for consideration of funding approval.

Summer Internship Program: In Summer 2021, OPC launched its first-ever paid internship program. This ten-week program provided undergraduate college students with the opportunity to gain experience working on coastal and ocean science, policy and management efforts in California. There was overwhelming interest in the program, with OPC receiving over 140 applications for five internships. Each of our interns worked closely with a staff mentor, led a specific project that advanced priorities in our Strategic Plan, and collaborated as a cohort on a joint project. OPC's (and the Bay Conservation and development Commission's) internship program is serving as a model across CNRA agencies; we intend to release the call for our next cohort of summer interns in early 2022.



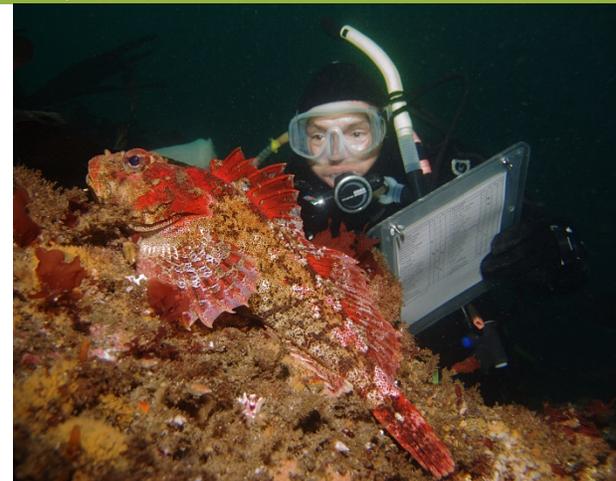


GOAL 3: ENHANCE COASTAL AND MARINE BIODIVERSITY

Contributions to Global Biodiversity: This year, OPC staff virtually attended several high-profile international meetings convened by the [United Nations Convention on Biological Diversity](#) as it prepares a new "[Post-2020 Biodiversity Framework](#)," which is intended to serve as a Paris-style global agreement to halt biodiversity collapse. The Framework will be finalized at the in-person portion of the Convention's [Biodiversity COP](#) next year. California is an official observer to this process, and OPC worked closely with CNRA leadership to develop and submit [comments](#) calling for a Framework that centers equity, elevates the role of subnational governments, and includes measurable habitat and biodiversity conservation goals and targets. These comments were summarized by Secretary Crowfoot in a recent [video message](#) to an audience of global leaders in October 2021. Additionally, on November 3, California became the first U.S. state to sign the [Edinburgh Declaration](#), joining a global network of subnational governments promising bold action to conserve the planet's biodiversity in the face of climate change. These engagements demonstrate California's role as a global model for effective action on biodiversity conservation.

Objective 3.1: Protect and Restore Coastal and Marine Ecosystems

Investments and Progress Towards the First MPA Decadal Management Review: California's [124 marine protected areas](#) (MPAs), which span the state's coastline, are unique in size, scale, biogeographic and cultural setting, and status as an ecologically connected network. The first [Decadal Management Review](#) of the State's MPA Network and [MPA Management Program](#) will be an informational report that will assess the MPA Network's progress toward [Marine Life Protection Act](#) (MLPA) goals, and will identify knowledge gaps and specific MPA management recommendations. More details about the MPA Management Program and the Decadal Management Review can be found in the [September 2021 OPC staff recommendation](#) and online at CDFW's [Decadal Management Review website](#).



Over the past decade, significant investments by the State and its philanthropic and nongovernmental partners have been made in the four pillars of the MPA Management Program:

- Research & Monitoring: California's [statewide MPA monitoring program](#) helps resource managers understand MPA effects and [impacts to local fisheries](#). Scientists and partner organizations have been [monitoring important habitats](#) inside and outside MPAs to track changes relative to baseline conditions. Researchers are also exploring the [human dimensions of MPAs](#), understanding impacts of [changing oceanography](#) in MPAs, and evaluating [connectivity](#) of the MPA Network. Summary reports for these long-term monitoring efforts will be publicly available in early 2022.
- Policy & Permitting: The [MPA Statewide Leadership Team](#) recently completed its 2021-2025 Work Plan, which identifies shared strategic priorities and key actions to promote

cross-sector collaboration. The Work Plan was approved in November 2021 and will be made publicly available in early 2022.

- Outreach & Education: OPC, CDFW, and FGC are collaborating with communications teams to disseminate information about the Decadal Management Review and improve broader MPA outreach and engagement with ocean stakeholders and California Native American Tribes. In 2021, CDFW hosted [four community meetings](#) to share information about the Decadal Management Review and receive input on local MPA priorities and will hold a meeting specifically for Tribal communities in early 2022.
- Through a small grants program, a suite of innovative outreach products were developed to increase MPA outreach and education efforts statewide. Some of these products include an [educational video](#) about MPA fishing regulations, a [bilingual interactive 3D MPA coloring book](#), and an [evaluation](#) that assessed the impact and effectiveness of outreach materials and social media campaigns. OPC plans to make an additional investment in the small grants program in February 2022.
- Enforcement & Compliance: CDFW Law Enforcement Division (LED) launched an automated electronic records management system that will allow for more robust data collection and reporting. CDFW LED, in partnership with OPC and the Resources Legacy Fund (RLF), also launched a first-of-its-kind District Attorney MPA Task Force to improve coordination related to the prosecution of MPA cases statewide. With support from OPC and RLF, the MPA Collaborative Network hosted a series of [14 Community Compliance Forums](#) to improve compliance throughout the state, which inspired the State's third round of funding to increase and [improve statewide MPA signage](#) needs.



California's 30 x 30 Initiative: OPC leadership and staff continue to work closely with Dr. Jennifer Norris, CNRA's Deputy Secretary for Biodiversity and Habitat, on the coastal and ocean components of California's 30 x 30 initiative. Recommendations from the Conservation of Coastal Waters Advisory panel [report](#), released earlier this year, have been integrated into a draft "Pathways to 30 x 30" document (draft anticipated in December 2021, final completed in early 2022), which will detail opportunities and strategies to achieve 30x30 in California. The pathway to conserving 30% of California's coastal waters will include the 16% of state waters currently protected within the state's network of MPAs and a prioritized focus on working with federal resource managers to strengthen biodiversity conservation measures in California's federally managed National Marine Sanctuaries, which currently cover 40.6% of state waters. This percentage will increase if the proposed Chumash Heritage NMS off Central California gets approved in the next couple of years. Such measures would be implemented in partnership with other state and federal agencies, Tribes and Tribal governments, and coastal stakeholders; they could include implementing mandatory vessel speed reductions, phasing out the use of particularly harmful fishing gear, strengthening water quality protections, restoring degraded habitats, and banning single-use plastics within Sanctuary watersheds. Additionally, restoring and revitalizing indigenous stewardship will be a critical step toward conserving coastal and ocean biodiversity and achieving the 30 x 30 target. The Pathways document will be released for public review and input before the end of the year.



International Union for the Conservation of Nature (IUCN) Green List for MPAs: OPC and CDFW continue to make progress in the effort to add California's MPA network to the [IUCN Green List of Protected and Conserved Areas](#) as an example of "best in class" marine conservation. An expert assessment group composed of California researchers, Tribal members, fishermen, ocean business owners, and conservationists has been convened to assess the extent to which California's MPAs meet IUCN criteria for effective protected areas. As California is the first protected area network to apply for the Green List, members of this expert group spent this year working with IUCN to develop a novel process for evaluating ecologically connected networks of protected areas. California's leadership in this area will pave the way for other protected area networks around the world to commit to meeting the Green List standard, and a final decision on Green Listing of the MPA network is expected next year.

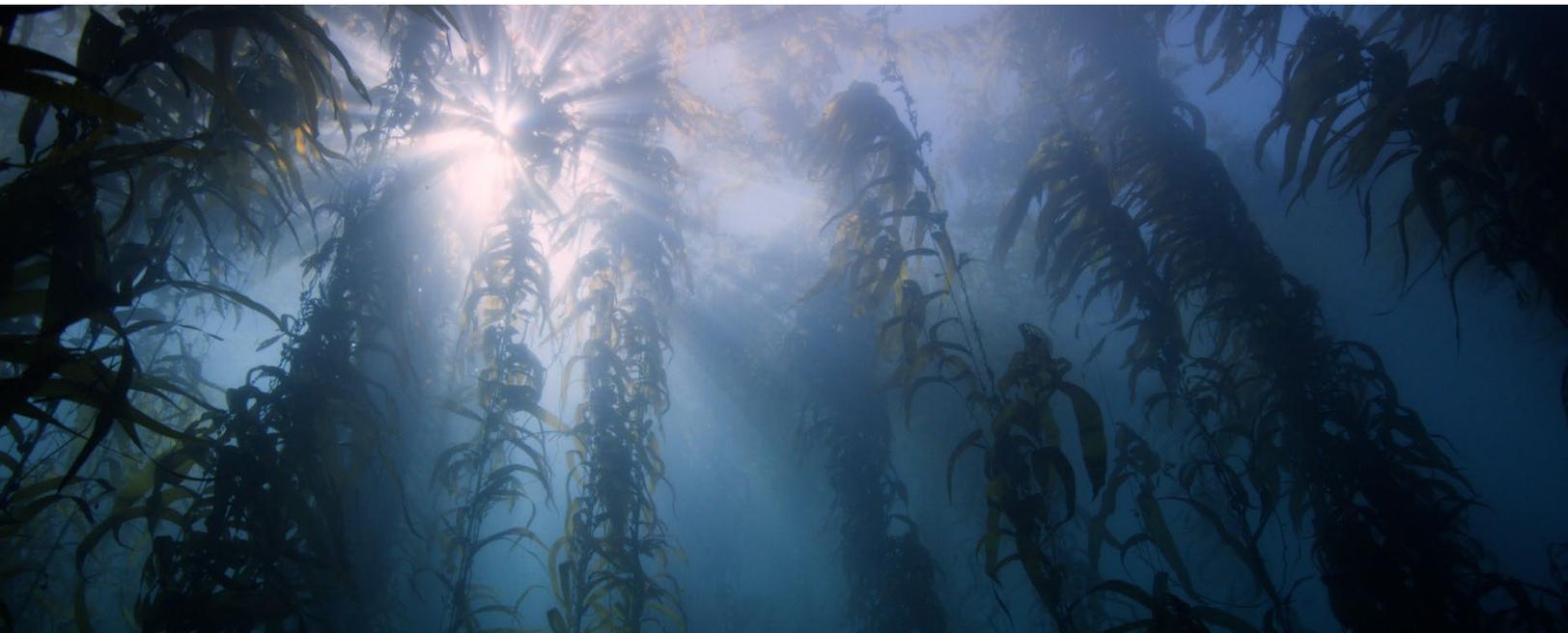
Objective 3.2: Restore and Protect Kelp Ecosystems

Kelp Forest Research and Recovery: The protection and restoration of California's kelp forests remains a top priority for OPC. After a 95% decline on California's North Coast from 2014-2019 (largely due to persistent warm waters, the prevalence of sea star wasting disease, and an explosion in kelp-eating purple sea urchin populations), bull kelp has [begun to reappear](#) as waters have cooled. Satellite imagery shows that kelp canopy off of the Sonoma-Mendocino

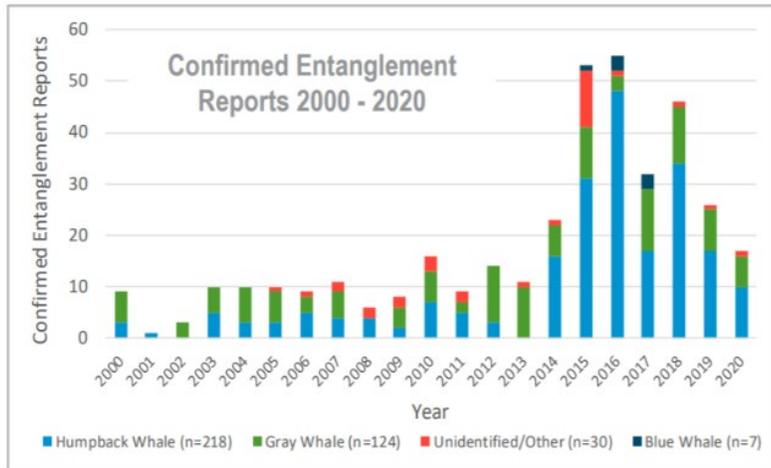
coast covers about as much area as it did in 2014 – nearly double last year's area – but this still only represents about 28% of the yearly average since 1984. Given the uncertain future of kelp in a changing ocean, OPC has invested in several groundbreaking pilot projects that are improving our understanding of the drivers of kelp declines and potential restoration approaches. This work has been undertaken in close partnership with the CDFW. Major accomplishments over the last year are as follows:

- As part of an OPC-funded restoration effort, commercial fishermen have removed nearly 40,000 pounds of urchin (700,000 individuals) from two 10-acre restoration sites in Mendocino County: Noyo Bay and Albion Cove. Data collection and analysis is ongoing, but diver effort appears to have kept urchin densities low since the start of the project, potentially facilitating kelp regrowth.
- OPC has played a key role in coordinating urchin culling efforts by recreational divers at Caspar Cove in Mendocino County and Tankers Reef in Monterey County, which are both still in their early stages but have shown promising results – for example, self-reported diver effort shows that 200,000 urchins have been culled at Tankers Reef since April 2021, bringing urchin density well below the critical threshold expected to facilitate the return of kelp.
- OPC, California Sea Grant, and CDFW continue to support over \$3 million in [solutions-oriented research projects](#) led by the nation's top kelp scientists. The results of these projects will improve resource managers' understanding of the drivers of recent kelp declines and the effectiveness of various restoration approaches.

In the coming months, OPC and CDFW will be working to develop this year's [Interim Kelp Action Plan](#) into a final Kelp Action Plan with priorities for collaborative, partnership-based action in four key areas: research and monitoring, restoration, policy development, and community engagement. Those action items will be based on the results of pilot projects as well as scientific, Tribal, and public input. The final Kelp Action Plan will set the stage for the development of an ecosystem-based Kelp Restoration and Management Plan, which will provide a framework for proactive, climate-ready management of California's kelp forests. That effort will be led by CDFW with support from OPC and is expected to launch early next year.



Objective 3.3: Support Sustainable Marine Fisheries and Thriving Fish and Wildlife Populations

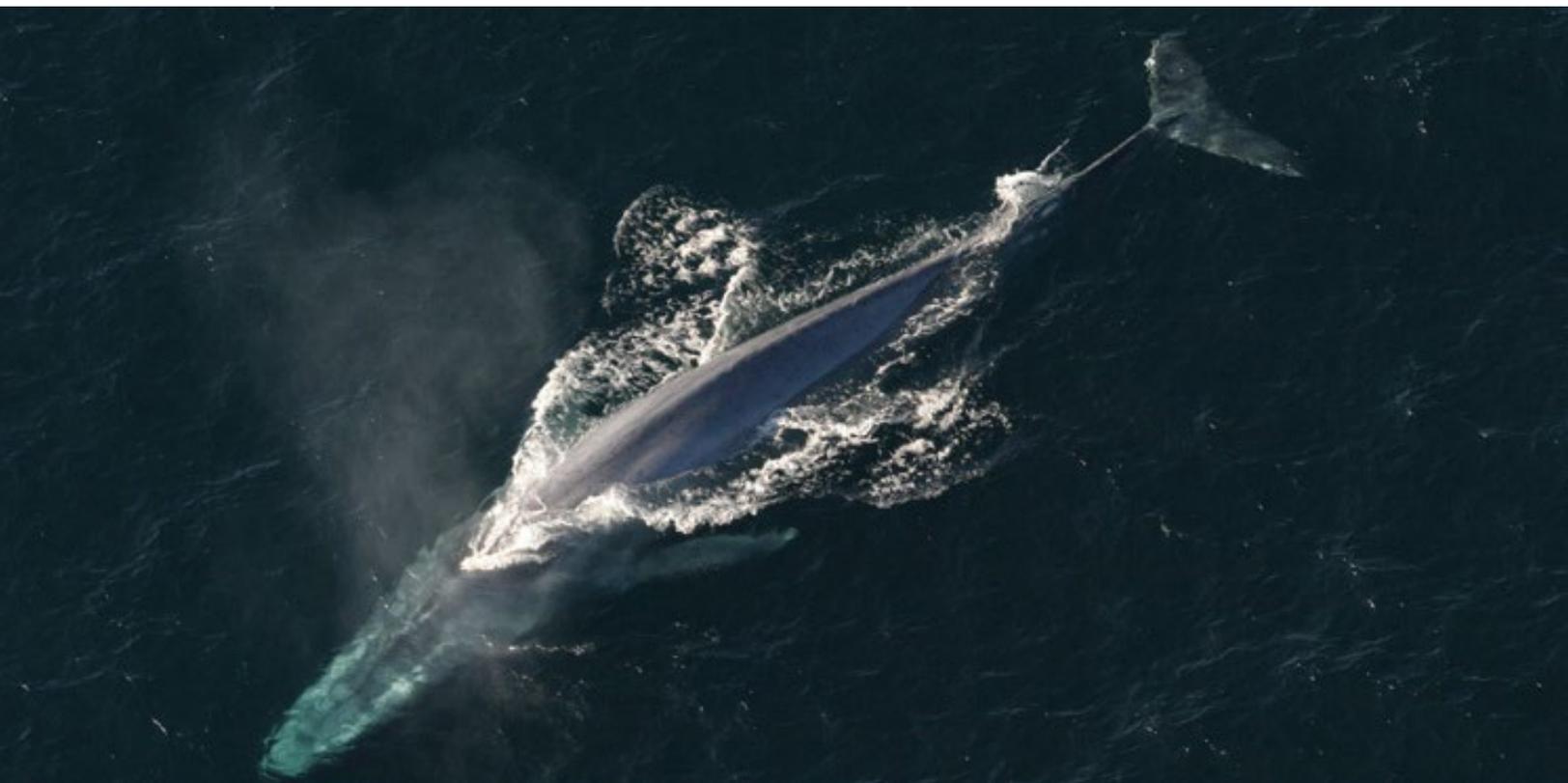


Reducing the Risk of Whale and Sea Turtle Entanglement in Fishing Gear:

Sparked by a [sharp increase of whale entanglements](#) in 2015, California took action to reduce the number of whale and sea turtle entanglements in state waters. CDFW established the [Risk Assessment and Mitigation Program](#) (RAMP), bringing together scientists, managers, and industry to collectively evaluate real-time entanglement risk and generate responsive management action.

Overall, entanglements are down significantly from their peak in 2016 due to a combination of cooperation between industry and managers as well as changing ocean conditions. OPC is continuing to support entanglement reduction efforts through the [Dungeness Crab Task Force](#), the RAMP process, and pilot program design.

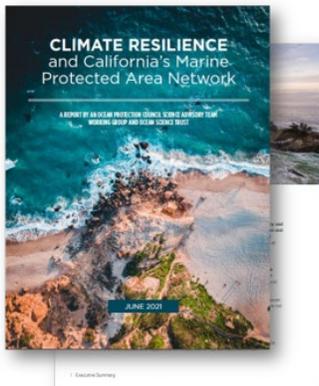
Entanglement risk data and predictive models are critical components to the RAMP. In an effort to advance entanglement science and reduce the risk of entanglements in fishing gear, three projects were funded through a competitive call that are in alignment with [OPC's Entanglement Strategy](#). Building from the [West Coast Entanglement Science Workshop](#) held in 2020, the funded projects are collaborative in nature, bringing together researchers conducting at-sea monitoring, refining habitat and occurrence models for whale, turtle, and forage species, and integrating data to enhance risk assessment for resource managers. In addition to providing real-time data for fisheries management, this suite of projects will inform, calibrate, and validate predictive models for the presence of endangered whales and sea turtles in California state and adjacent federal waters.



Advancing Science: OPC's Science Advisory Team and Ocean Science Trust

In 2021, Working Groups of OPC's Science Advisory Team, made up of interdisciplinary scientific experts, produced several reports that advance the state of the science and identify critical research gaps on several Strategic Plan priorities. Led by Ocean Science Trust in close partnership with OPC, these reports provide foundational scientific guidance that are informing policy and management decisions on MPAs, ocean acidification, and microplastics.

[Scientific Guidance for Evaluating California's Marine Protected Area Network](#) provides direction for the upcoming Decadal Management Review of California's MPA Network and future adaptive management reviews. It translates the goals of the Marine Life Protection Act into tractable scientific questions, provides methods of integration of monitoring data, recommends analytical approaches for understanding Network-wide performance, and identifies data gaps.



[Climate Resilience and California's Marine Protected Areas Network](#) provides an overview of the threats that climate change poses to California's coastal and ocean ecosystems, catalogs potential mechanisms through which MPAs could provide ecological and societal resilience in the face of those threats, suggests research questions to increase understanding of the nexus between MPAs and climate resilience, and sets forth recommended actions to support proactive, climate-ready management of California's MPAs.

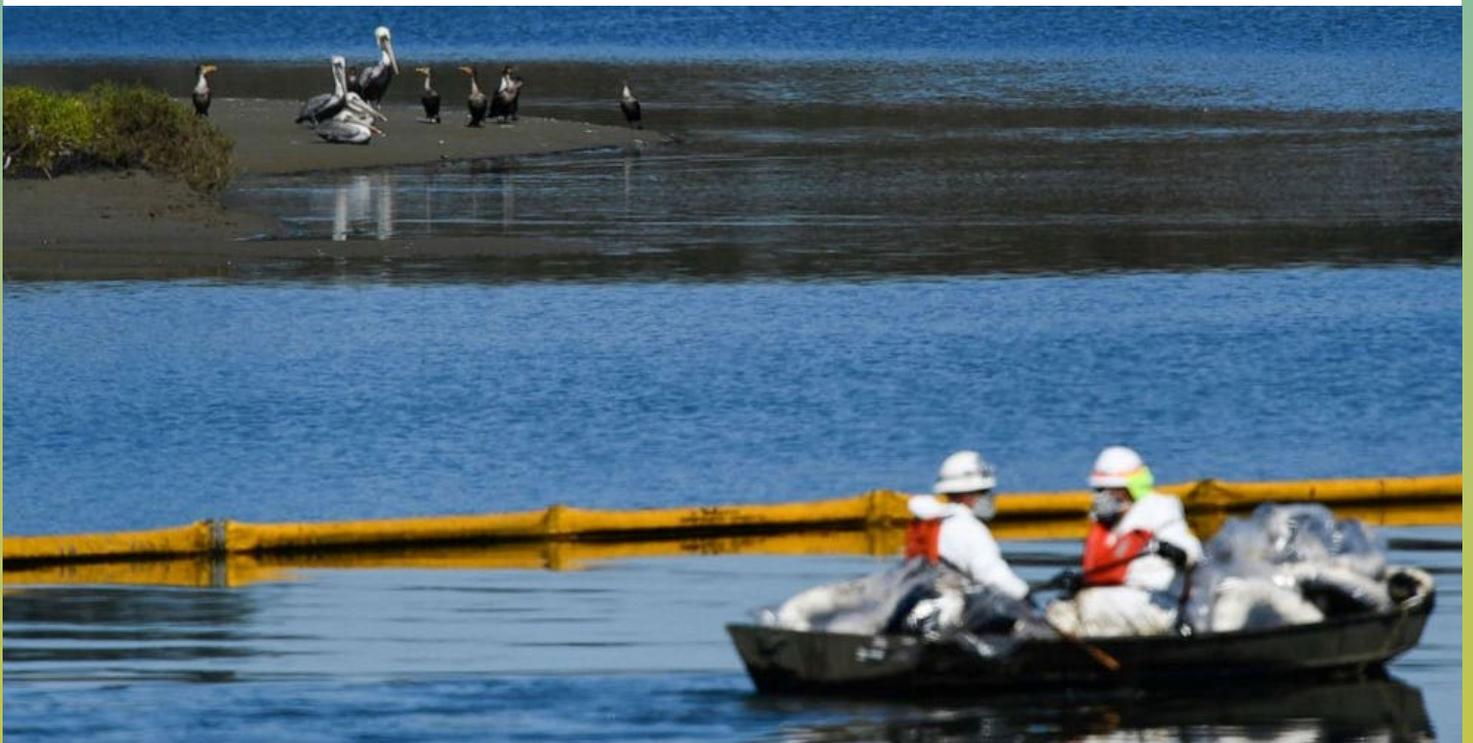
[Ocean Acidification and Hypoxia Biological and Chemical Monitoring](#) provides recommendations to enhance and standardize ocean acidification and hypoxia (OAH) biological measurements into ongoing OAH monitoring programs, building on a [2020 report](#) from the Ocean Acidification and Hypoxia Science Task Force to enhance California's OAH monitoring network. This report informed \$3.6 million in science-based investments for monitoring, research and synthesis projects to enhance understanding of OAH impacts on marine ecosystems and numerous marine species, as well as the aquaculture and fishing industries.

[Assessing the Risk of Microplastic Pollution in California](#) establishes a framework to evaluate the impact of microplastics on marine and coastal ecosystems and human health. It also includes scientific guidance on sources, fate, and transport of microplastics, and recommended research priorities to fill critical data gaps. The report underpins the Statewide Microplastics Strategy (scheduled for approval in early 2022) being developed by OPC pursuant to SB 1263 (Portantino), which will increase understanding of the scale and risks of microplastics on marine ecosystems and identify proposed solutions to address harmful impacts.



OPC has also funded at-sea trials of fishing gear modifications and innovations designed to reduce or eliminate entanglements while allowing for continued fishing activity. The [National Marine Sanctuary Foundation](#) is working collaboratively with the fishing community, fishery managers and scientists to test pop-up fishing systems and a low-tech breakaway rope design within the Dungeness crab fishery. Additionally, the [Drift Gill Net Transition Program](#) continues to incentivize fishers to transition out of the offshore drift gill net shark and swordfish fishery and into lower bycatch fisheries. To date, the program has funded 24 participants (both active and inactive permit-holders), paying for the surrender and destruction of large-mesh, drift gillnets.

Amplify Energy Oil Spill: On October 3, an offshore oil pipeline owned by Amplify Energy spilled an estimated 25,000 gallons into Orange County's coastal waters. Initial reports suggested the spill was much larger, prompting a large-scale response from the Coast Guard, NOAA, CDFW's Office of Spill Prevention and Response (OSPR), State Lands commission, State Parks, local government and NGOs. OSPR, the Coast Guard and NOAA led the natural resources damages and spill response efforts in Orange and San Diego Counties. OPC staff assisted OSPR in convening regular interactive briefings with representatives from the NGO community. This allowed for timely and efficient dissemination of information and reassurance that the state was doing everything possible to address the spill. As of November 2021, 5,544 gallons of oil and 13.6 barrels of tar balls had been recovered across nearly 600 miles of shoreline. Oil spills have the potential to devastate sandy beach and wetland habitat, and assessment of impacts to sensitive ecosystems is ongoing. In terms of [impacts to wildlife](#), 116 affected birds were recovered during the response (including 82 fatalities), with 22 birds released after proper cleaning and rehabilitation. Six marine mammals were recovered dead. No oiled animals were observed by the end of October. Beaches are now open, fisheries closures have been lifted, and there is no reported public health risk at this time.



Objective 3.4: Improve Coastal and Ocean Water Quality

Top Ten Recommendations to Address Plastic Pollution: Recognizing that the COVID-19 pandemic fundamentally rolled back or delayed progress in plastic pollution reduction in California, OPC held a targeted discussion on plastic pollution during the September 2020 OPC meeting, which resulted in the adoption of the [Top 10 Recommendations to Address Plastic Pollution](#) in February 2021. These actionable recommendations will help position California as an international leader in source reduction by fostering innovation, advancing the best available information to inform decision-making, and promoting policies that advance plastic source reduction.

Microplastics Definition. In 2020, the State Water Resources Board, consistent with Senate Bill 1422 (Portantino, 2018), adopted a definition of microplastics in drinking water: “particles (that) have at least three dimensions that are greater than 1 nm and less than 5,000 micrometers (µm) (the equivalent of 5 millimeters).” Defining microplastics in drinking water is a first step to standardize methods for monitoring and assessing microplastics and supports the development of the Statewide Microplastic Strategy.

In support of advancing Recommendation #9 (Work with the Water Quality Monitoring Council and the Surface Water Quality Monitoring Program to develop a statewide monitoring program for macro- and microplastics), the OPC-sponsored [Trash Monitoring Methods Validation Project](#) released the [Trash Monitoring Methods Field Validation Report](#) and [Trash Monitoring Playbook](#) outlining four

trash monitoring methods in state receiving waters, determined the accuracy and precision of the methods, and how they compare to one another. This project lays the groundwork for developing a baseline of plastic pollution monitoring data statewide, and to assess the efficacy of plastic reduction strategies. Another OPC-sponsored project, the [Reusable California Policy Playbook](#), launched in November 2021 as a resource hub to inform and help local governments, policymakers, and businesses reduce single-use plastics and packaging in food service operations, consistent with Recommendation #7 (Provide technical assistance and tools that assist with implementation of local comprehensive food service ware ordinances).

OPC is continuing to convene meetings with the National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program and interagency Plastic Pollution Steering Committee to implement the Top 10 Recommendations to Address Plastic Pollution, especially in light of recent research finding 8 million tons of pandemic-associated plastic waste have been generated globally, with more than 25,000 tons of this plastic waste entering the global ocean. This is on top of the estimated 8 million tons per year of plastics that end up in oceans around the world.



Statewide Microplastics Strategy: OPC is tasked by Senate Bill 1263 (Portantino, 2018) with leading statewide efforts to address and increasing understanding of microplastics (defined as particles 1 nm – 5 mm in size) in California and requires OPC to adopt and implement a statewide Microplastics Strategy to increase understanding of the scale and risks of microplastics on marine ecosystems and identify proposed solutions to address harmful impacts of microplastic pollution. This Microplastic Strategy will serve as an important tool to meaningfully manage this pervasive source of marine pollution and inform a research strategy to inform key knowledge gaps.

To-date, two OPC-funded reports have been published to inform an effective statewide Microplastics Strategy: (1) [Microplastic Pollution in California: A Precautionary Framework and Scientific Guidance to Assess and Address the Risk to the Marine Environment](#) released in May 2021 by a group of leading interdisciplinary scientists, in partnership with Ocean Science Trust; (2) [A Synthesis of Microplastic Sources and Pathways to Urban Runoff](#) by the San Francisco Estuary Institute (SFEI) in October 2021. Together, these reports have informed a 2-prong approach to addressing microplastic pollution: solutions and 'no-regrets' actions that can be employed now under the precautionary approach to prevent the proliferation of microplastic pollution, and identifying research needs specific to California to inform future action. OPC is partnering closely with the State Water Resources Control Board and anticipates releasing a draft Microplastics Strategy for public comment in December 2021, with the final Microplastics Strategy presented to the Council in early 2022 for adoption.



GOAL 4: SUPPORT OCEAN HEALTH THROUGH A SUSTAINABLE BLUE ECONOMY

Objective 4.1: Advance Sustainable Seafood and Thriving Fishing Communities

Reauthorization of California Fisheries Fund: OPC reauthorized its contribution to the [California Fisheries Fund](#) (CFF) and transferred administration of the fund to [California FarmLink](#) (a Community Development Financial Institution focused on lending to sustainable/organic agriculture and fisheries to support economic and environmental resilience). The CFF is a nonprofit, mission-based, revolving loan fund that supports sustainable commercial fisheries on the West Coast. Beginning in 2008, the CFF has helped borrowers (fishermen, fishing businesses, ports, communities and others) succeed in fisheries, achieve environmental conservation, improved profitability for the industry, and stability for port communities. To date, the CFF has supported 47 loans to 35 borrowers – ranging from \$10,000 to \$458,000 – totaling almost \$6 million since the first loan closed in 2009 (the average approved loan amount is about \$147,000). Twenty-nine out of 47 loans have been fully repaid, and twelve of these loans were paid back early. Extending the fund and transferring administration to CA Farmlink will build upon the CFF's successful 13-year history and position the fund to continue to help California's small-scale commercial fishers maintain their sustainability and viability in the face of changing ocean conditions.



Objective 4.2: Promote Sustainable Aquaculture

Aquaculture Principles and Statewide Aquaculture Action Plan: In June 2021, OPC publicly released the [Guiding Principles for Sustainable Marine Aquaculture](#) in California. The Guiding Principles were cooperatively developed by the Aquaculture Leadership Team (led by Secretary Crowfoot and comprised of programmatic staff of all state agencies involved in the regulation, permitting and development of aquaculture in California (the California Department of Fish and Wildlife, California Fish and Game Commission, California Coastal Commission, State Lands Commission, OPC, California Department of Food and Agriculture, California Department of Public Health and the State Water Resources Control Board)). Most recently, the Leadership Team met in late September to coordinate a cohesive strategy for implementing the Guiding Principles across all member agencies.

These Principles are the foundation for the statewide Aquaculture Action Plan, which is under development with planned completion by 2023. The National Center for Ecological Analysis and Synthesis (NCEAS) at UC Santa Barbara and California Sea Grant, in close partnership with OPC staff, convened separate community and scientific listening groups which have each now met several times to help guide the development of the Action Plan. This was a major milestone in the plan development process and completion of a preliminary draft Action Plan for agency review is expected by the end of 2021.

Objective 4.4: Guide Sustainable Renewable Energy Projects

Floating Offshore Wind: OSW has been identified as a key emerging component of California's renewable energy strategy. The Biden Administration announced it aims to have 30 gigawatts of offshore wind operating by 2030 and the Bureau of Ocean and Energy Management (BOEM) is pursuing an aggressive timeline with lease sales expected in California sometime in late 2022. BOEM has designated two Wind Energy Areas (WEA) offshore of [Morro Bay](#) and [Humboldt Bay](#). BOEM is currently developing Environmental Assessments for both WEAs as part of the formal environmental review process under the National Environmental Policy Act. California is also prioritizing accelerated developing of OSW. The 2021-22 State Budget included \$20 million to spur environmentally responsible development of OSW, and the Governor signed [AB 525](#) into law to support a coordinated planning process. The California Coastal Commission is preparing for consistency determination (CD) hearings for the Humboldt WEA in April 2022 and the Morro Bay WEA in June 2022. OPC is supporting the CD process through funding a series of projects that have been identified as key environmental and cultural information gaps. Recently funded and planned projects include: support for spatial environmental and ocean use mapping and modeling projects; synthesis of existing data; and an inventory of Tribal cultural resources. The California Energy Commission, State Lands Commission, California Coastal Commission, CDFW and OPC have been working together closely on efforts to move floating offshore wind development, 20-30 miles offshore, forward in a manner that protects marine life, fisheries, cultural resources and the economy. California State Lands Commission (SLC) also released its final [Preliminary Environmental Assessment](#) for two lease applications located in state waters offshore Vandenberg Space Force Base. Because the proposed projects would cause an environmental effect, analysis of the impacts of the proposed offshore facilities will require preparation of an Environmental Impact Report before the SLC makes a decision on the applications.



LOOKING AHEAD TO 2022

Addressing the impacts of climate change on California's coast and ocean will continue to be a top priority for OPC in 2022, with ongoing focus on SLR and OAH, including an inventory of coastal wetland, beach, rocky intertidal and eelgrass habitats. Subsequent to the completion of the inventory, a habitat vulnerability assessment will be completed using the latest sea level rise model projections. We will partner with the member agencies of the Sea Level Rise Leadership Team to ensure that investments in coastal resilience planning and adaptation projects are strategic, leveraged and complementary.

In addition, OPC, in partnership with CDFW, will focus on building climate-ready fisheries, understanding the role of MPAs as a tool for climate change refugia, and increasing marine ecosystem resilience. We will work with the California Water Quality Monitoring Council to initiate development of a model Coastal Habitat and Water Quality Monitoring Program. The model monitoring program, if adequately funded, will help track biological, physical and chemical indicator status and trends over time with the goal of creating a comprehensive picture of current ecosystem health, human health risks, and climate-driven shifts. This information will be used to help set funding priorities and improve the state's responsiveness and implementation of management strategies that are flexible and adaptive.

As we head towards the state's first adaptive management review of the MPA Network, we will support CDFW and FGC by amplifying communication and outreach, ensuring the scientific synthesis of ongoing monitoring efforts is complete and integrated into the Decadal Management Review report, and leading program development for the associated symposium planned for Spring 2023.

2022 will also bring completion of several high priority initiatives described above, including OPC's Tribal Engagement Strategy and Equity Plan. We will provide more funding to increase the scope and geographic scale of the Tribal Marine Stewards Network, with the goal of including three to four additional member tribes (with representation from Southern California) and expanding focus beyond MPA monitoring to ocean and coastal stewardship and management. And we will use lessons learned from our recent Proposition 1 and 68 funding calls to further improve engagement with Tribes and communities entitled to environmental justice and create more equitable opportunities to access state funding.

To further combat the local and global impacts of plastics on coastal and marine ecosystems, we will make strategic investments to implement the Top Ten Recommendations to Address Plastic Pollution. Also, we will fund research to provide us with better information on the impacts of microplastics on aquatic life, the sources of microplastics to coastal waters and watersheds, and source reduction actions to reduce the amount of microplastics polluting aquatic ecosystems.

We will continue to work closely with the members of the Aquaculture Leadership Team to implement near-term priorities identified in the Aquaculture Principles. In mid-2022, we will initiate public outreach to solicit feedback on the draft Aquaculture Action Plan and anticipate bringing the final plan to the Council for adoption in 2023. We will also continue to be deeply involved in California's OSW development efforts, funding additional studies to further

understand the potential impacts to marine ecosystems, fisheries and cultural resources and maintaining ongoing collaboration with CCC, CEC, SLC, and DFW to create the OSW strategic plan mandated in AB 525.

Despite the considerable obstacles posed by the COVID-19 pandemic in 2021, California made considerable progress in efforts to protect our coast and ocean. However, the increasing pace of climate change impacts and growing scourge of the plastic pollution have highlighted the urgency for more immediate action. California can't wait ten years to build coastal resilience and climate resilience of marine fisheries and ecosystems. The state can't wait for all scientific data gaps to be filled before we take action on microplastics and ocean acidification. The urgency of the climate and biodiversity crises require us to act now. In 2022, OPC will continue to fund critical, actionable science, but our top priorities will be funding the projects and creating the policies that will make our coast more climate resilient, provide equitable coastal access and influence for everyone, and protect biodiversity in a manner that enables Californians and our coastline and ocean waters to thrive.

