

## NATIONAL MARINE SANCTUARIES COORDINATION REPORT

### **Introduction:**

The Office of National Marine Sanctuaries (ONMS) serves as trustee for the nation's system of marine protected areas (MPAs). Through active research, management and public engagement, national marine sanctuaries sustain healthy environments that are the foundation for thriving communities and stable ocean-dependent economies. The primary objective of the National Marine Sanctuaries Act (NMSA) is resource protection of marine areas (Great Lakes included) of special national significance, while promoting sustainable uses. Five national marine sanctuaries are located on the west coast: Olympic Coast, Greater Farallones, Cordell Bank, Monterey Bay, and Channel Islands (OCNMS, GFNMS, CBNMS, MBNMS and CINMS respectively)

### **Purpose of the coordination report**

Communication and coordination between ONMS, and the Pacific Fishery Management Council (Council) has been very strong and continuously improving over the past decade. The West Coast Regional Office (WCRO) within ONMS is providing this coordination report to the Council in an effort to keep the Council informed of relevant national marine sanctuary actions and programs. This report contains an update of activities and programs of mutual interest recently implemented by west coast national marine sanctuaries with a preview of upcoming activities. Sanctuary activities are grouped according to the following topics: nominations, management, climate change, habitat, research and monitoring, and recreational fishing.

### **NOMINATIONS**

- **Sanctuary nomination process – WCRO** ([www.nominate.noaa.gov](http://www.nominate.noaa.gov))  
**Purpose:** In response to widespread interest from the public, in June 2014 NOAA launched a process to accept new national marine sanctuary nominations. ONMS reviews sanctuary nominations against eleven criteria that are derived in large part from the NMSA. Nominations that successfully pass this review are added to an inventory of areas NOAA may consider for potential designation as a national marine sanctuary. A sanctuary nomination is not the same as a sanctuary designation. Designation is a separate process that by law is highly public and participatory, and often takes several years to complete.  
**Outcome:** As of January 2017, NOAA has received 14 nominations. Of these, four are under review, five have been declined or withdrawn, and five have been admitted to the inventory. Two nominations on the inventory have been selected for designation: Mallows Bay – Potomac River in Maryland and Lake Michigan in Wisconsin. Two nominations have been submitted along the west coast area for which the Council has oversight: Chumash Heritage off of the San Luis Obispo and Santa Barbara county coastline, and Southern California Offshore Banks representing Cortes, Tanner, Cherry and Northwest Banks, and Garret Ridge. Below are a few more details of the nominations for the west coast:

- **Chumash Heritage National Marine Sanctuary Nomination**  
The nomination was originally submitted in February 2015, and resubmitted after some revisions in July 2015 by the Northern Chumash Tribal Council. The second submission was added to the inventory of nominations on October 5, 2015, with community support from the public, elected officials, businesses, scientists, and environmental groups. The purpose of the nomination is to protect, study and interpret the region's abundant natural resources and maritime heritage, including the Chumash cultural heritage. The region contains an internationally significant ecological transition zone, supporting high biological diversity and densities of numerous important species. An additional purpose is to protect the economic health of the area, including commercial and recreational fisheries. The nomination further states that the proposed sanctuary should not have impact on treaty fishing rights, nor impose future regulations upon commercial or recreational fishing. There is not an active evaluation within ONMS at this time to consider moving this site forward for designation.
- **Southern California Offshore Banks National Marine Sanctuary Nomination**  
The nomination was submitted January 9, 2017 by the Southern California Marine Institute and Vantuna Research Group. The proposal is currently under review. The proposal was submitted with letters of support from local university scientists, aquaria, and sport fishing interests. The nomination's purpose is to protect and manage critical offshore resources, including endangered and protected species such as white abalone (*Haliotis sorenseni*) and promote collaborative research. The proposal does not recommend curtailment of fisheries (commercial or recreational) or military activities, but emphasizes the need to coordinate these offshore activities with national security concerns while prohibiting oil and gas extraction and other industrial uses.
- **UNESCO World Heritage nomination - WCRO** (<http://whc.unesco.org/en/list/>)  
**Purpose:** The World Heritage program identifies and designates the most iconic natural and cultural resource sites in the world. NOAA has proposed for World Heritage designation the coastal and marine waters of central California as the California Current Conservation Complex. The World Heritage process requires that member countries maintain a 'Tentative List' of areas that could one day be nominated to the United Nations Educational, Scientific and Cultural Organization (UNESCO); the U.S. is in the process of updating its Tentative List, to which NOAA has submitted the California Current Conservation Complex. The nomination to the U.S. Tentative List is in recognition that the three national marine sanctuaries - CBNMS, GFNMS and MBNMS - are complemented by several national parks, a national wildlife refuge, a national monument and numerous state protected areas. NOAA's proposal highlights the amazing biodiversity and wildlife of the area, long dubbed the 'Serengeti of the Sea', in co-existence with considerable human activity in the region. Importantly, these human activities are well managed through other regulatory actions, including strong and sensible fishing regulations and a healthy state coastal management program. Examples of places that are recognized as World Heritage sites include the Great Barrier Reef, Grand Canyon, Yellowstone, and Yosemite National Parks, along with the Acropolis in

Greece, and the Colosseum in Rome. The UNESCO process for consideration of an area to the World Heritage program is extensive and can take years to complete.

**Outcome:** The National Park Service published a Federal Register Notice on December 9, 2016 requesting comments on the existing and proposed additions to the U.S. Tentative List. The proposed California Current Conservation Complex is being considered as an addition to the U.S. Tentative List.

**Timeline:** Undetermined.

**Partners:** Numerous scientific organizations and related management agencies including the California Coastal Commission, National Parks Service and Bureau of Land Management.

## **MANAGEMENT**

- **Condition Report Update – CINMS** (<http://sanctuaries.noaa.gov/science/condition/>)

**Purpose:** The CINMS Condition Report is currently being updated. A sanctuary condition report provides a summary of resource conditions, specifically water quality, habitat, living resources and maritime archaeological resources in the sanctuary; describes pressures on those resources and the current condition and trends of sanctuary resources; and summarizes management responses to pressures that threaten the integrity of the sanctuary's marine environment. Timing of the report's development will allow it to serve as a precursor to inform a subsequent CINMS management plan revision process.

**Outcome:** Since release of the first CINMS condition report in 2009, the format and some of the questions have changed. The introduction of indicators greatly improved the ability to establish quantitative status and trends, and the use of confidence scores improves the certainty of the status and trend ratings. CINMS will be the first national marine sanctuary to write a report using the new national guidelines, which includes a section on ecosystem services. The revised CINMS Condition Report will be made available online.

**Timeline:** Full report completion/distribution is estimated to occur by the end of 2017, or in early 2018.

**Partners:** The CINMS Advisory Council's Research Activities Panel (RAP) was instrumental in vetting the report's assessment approach, identifying indicators to track over time, and participating in workshops to establish status and trends ratings. The RAP consists of local researchers within the University of California and Cal State systems, state agencies such as the California Department of Fish and Wildlife (CDFW), federal agencies such as the Bureau of Ocean Energy Management and the National Park Service, as well as local NGOs such as the Santa Barbara ChannelKeeper. Processed data and analyses were contributed by Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), Channel Islands National Park, Southern California Coastal Watershed Research Project, Santa Barbara Channel Long-term Ecological Research, Santa Barbara Channel Marine Biodiversity Observing Network, UCSB Plumes and Blooms Project, National Marine Fisheries Service (NMFS), CalCOFI, Multi-Agency Rocky Intertidal Network, and Marine Applied Research and Exploration.

- **Management Plan Review – MBNMS**

(<http://montereybay.noaa.gov/intro/mp/2015review/welcome.html>)

**Purpose:** MBNMS is revising and updating the 2008 Management Plan. The sanctuary kicked off management plan review (MPR) in the Fall of 2015 by issuing their most recently updated condition report, followed by public scoping. High priority issues identified by the public were wildlife disturbance (marine mammal harassment and whale entanglement), desalination, regional monitoring, and sediment management and beach loss. Staff have been developing draft outlines of new and revised action plans, while the MBNMS Advisory Council has been considering and discussing issues and providing input to staff on revisions and updates to the action plans. Two separate working groups of the sanctuary advisory council have been meeting to provide input on two issues identified as high priority by the advisory council: approaches to whales (wildlife disturbance), and acoustics (noise).

**Outcome:** Draft and final management plan, draft and final environmental analyses, and proposed and final regulations.

**Timeline:** MBNMS aims to issue for public comment a draft management plan, environmental analysis and proposed regulations by early 2018; a final draft of these documents is expected by mid-2019.

**Partners:** The MBNMS Advisory Council and other experts from local, state and federal partner agencies.

## CLIMATE CHANGE

- **Climate-Smart Conservation Program – GFNMS**

(<http://farallones.noaa.gov/manage/climate/>)

**Purpose:** The “Climate-Smart Conservation” program is an initiative that integrates climate change science, monitoring, adaptation, mitigation, and communication into sanctuary management. Thereby promoting nature-based solutions to:

- Reduce greenhouse gas emissions and enhance carbon sinks
- Reduce climate change impacts on wildlife and people and enhance resilience
- Sustain vibrant, diverse ecosystems

**Outcomes/Partners:** The Climate-Smart Conservation Program has worked with local experts and partners to develop the following regional resources:

- *Green Operations Plan* (2008) provides over 130 strategies to reduce the greenhouse gas emissions that result from the facilities and operations of GFNMS, developed by representatives from the San Francisco Department of Environment, Golden Gate National Park, Presidio Trust, BAR Architects, and several members of the GFNMS Advisory Council.
- *Climate Change Impacts Report* (2010), which provides a synopsis of the best available knowledge on observed and projected physical and biological impacts from climate change in north-central California coast and ocean ecosystems. The report is the outcome of a year and a half of intensive collaboration among local experts representing 16 agencies, organizations, and academic institutions to assess and downscale global climate change information into a regional climate change survey. Existing observations and science-based expectations were used to identify an extensive suite of potential climate change impacts to habitats, plants, and animals within the San Francisco Bay Area's unique ocean and coastal zones.

- *Ocean Climate Indicators Monitoring Inventory and Plan* (2013), a 2-year collaborative and interdisciplinary effort with input from over 50 regional research scientists and resource managers developed an indicators-based monitoring goal for the region and recommended objectives, strategies, and activities to meet this goal. The working group also developed recommendations for the priority levels of the monitoring activities; compiled information about the best-available monitoring for each indicator; assessed knowledge gaps that improved indicator monitoring could fill; and provided case studies of potential management uses for each indicator.
  - *Climate Change Vulnerability Assessment for the North-Central California Coast and Ocean* (2014) is a science-based effort to identify how and why focal resources (habitats, species, and ecosystem services) across the North-Central California coast and ocean region are likely to be affected by future climate conditions. The goal of this assessment is to provide expert-driven, scientifically sound assessments to enable marine resource managers to respond to, plan, and manage for the impacts of climate change to habitats, species, and ecosystem services within the region.
  - Sanctuary Climate Action Plan (2016), the result of a 2-year process to characterize climate impacts and vulnerabilities to sanctuary resources along the North-Central California coast and ocean, and to develop management strategies to respond to and decrease those vulnerabilities, ultimately enhancing resource resilience to climate impacts. The action plan represents the culmination of a sanctuary advisory council planning process that resulted in 78 adaptation strategy recommendations for the region's management agencies to take to enhance coastal habitat resilience.
  - *Rapid Vulnerability Assessment Tool* (2017): The Climate Program Coordinator of GFNMS in partnership with EcoAdapt and the Commission for Environmental Cooperation (CEC), created a Rapid Vulnerability Assessment (RVA) tool, and piloted this tool at two climate vulnerability assessment workshops for MPA managers in the Pacific Northwest and southern California. The Pacific Northwest workshop convened 18 MPA managers, representing Parks Canada, Fisheries and Oceans Canada, Olympic Coast National Park and OCNMS. The SoCal workshop convened 29 MPA managers, representing the Mexican government, El Vizcaino Biosphere Reserve and Isla Guadalupe in Mexico, Channel Islands National Park and CINMS. The RVA tool is now being finalized with input from workshop participants, and will enable MPA managers across North America to better understand climate impacts to their resources and increase their capacity to respond with minimal financial burden.
- **Olympic Coast as a Sentinel Site for Ocean Acidification - OCNMS**  
**Purpose:** Sanctuary advisory councils in each of the five west coast national marine sanctuaries have expressed concerns about the potential catastrophic impacts from ocean acidification to sanctuary resources. Seasonal upwelling of colder, nutrient rich water (with low pH) onto the continental shelf makes marine ecosystems on the west coast particularly vulnerable to ocean acidification. OCNMS is an ideal candidate to serve as a sentinel site for ocean acidification in the Pacific Northwest, as the effects of ocean acidification are likely to be detected first on the outer coast prior to the coastal Strait of Juan de Fuca and Puget Sound. Sentinel sites are places where coordinated environmental observations and applied science by government, tribal, academic, and

citizen scientists enable early detection of conditions that are changing because of natural events and human induced change. Sentinel sites join, align, and focus capabilities for monitoring, research, data analysis, education and outreach to inform decisions on potential management actions related to pressing issues like ocean acidification.

**Outcome:** In September 2016, OCNMS and NOAA's Ocean Acidification Program co-hosted a workshop in Forks, Washington involving 45 subject matter experts, resource managers, and stakeholders to begin articulating the components of an ocean acidification sentinel site program for the Olympic Coast. OCNMS is currently working with its advisory council to further develop the concept, as well as working with partners to seek additional funding to implement key components, which will include enhanced monitoring and research, and education and outreach.

**Timeline:** As a result of the workshop this past fall, OCNMS has collaborated on the submission of two funding opportunities through NOAA's Ocean Acidification Program. If funded, work would begin in 2017.

**Partners:** Makah Tribe, Quileute Tribe, Hoh Tribe, Quinault Indian Nation, NOAA's Ocean Acidification Program, NOAA's Pacific Marine Environmental Lab, Northwest Association of Networked Ocean Observing System, Olympic National Park, Washington Department of Ecology, Washington Department of Natural Resources, Washington Department of Fish and Wildlife (WDFW), OCNMS Advisory Council, University of Washington Ocean Acidification Center, and Washington SeaGrant.

- **Proposed Desalination Plants in Monterey Bay – MBNMS**

(<http://montereybay.noaa.gov/resourcepro/resmanissues/desal-projects.html>)

**Purpose:** Because of federally- and state-ordered cutbacks from the Carmel River, CA, and drought conditions, several desalination projects are being proposed on the coastline adjacent to MBNMS. Staff of MBNMS are providing comprehensive and thorough NEPA review of three proposed desalination projects and subsequent reasonable and appropriate permit decisions as necessary. It is unlikely all three plants will be permitted and built, given that together they far exceed the water cutback required due to dam removal on the Carmel River. The MBNMS management plan of 2008 produced guidelines in coordination with NMFS to ensure that future desalination plants adjacent to the sanctuary are properly sited, designed, and operated to avoid damaging impacts to the marine environment, including fish and their habitat. MBNMS staff are using these guidelines to evaluate and advise the following projects:

- The California American Water Company (CalAm) project proposes to develop water supplies for Monterey District in the amount of 9.6 million gallons per day (MGD) using slant wells in Marina, CA. The CalAm project will significantly reduce draw down in the Carmel river basin, thereby protecting habitat for steelhead. The California Public Utilities Commission (CPUC) and MBNMS are lead agencies for the state and federal environmental reviews. The preferred alternative is a smaller desalination plant using a subsurface seawater intake system (the slant wells) combined with water recycling to replenish the groundwater.

**Timeline:** A public review of the environmental documents was initiated January 12, with a deadline of February 27, 2017. Three public meetings are being held in the central California region in February 2017.

- The DeepwaterDesal project proposes a 25 MGD desalination plant using an existing open water intake with new screens and a new outfall at Moss Landing, CA. The California State Lands Commission (CSLC) and MBNMS are lead agencies for review of the project.

**Timeline:** The state and federal draft environmental documents are slated for release in late 2017.

- The People’s Moss Landing project proposes a 12 MGD desalination plant using a new screened open water intake and the extension of an existing outfall. The Moss Landing Harbor District (MLHD) and MBNMS are lead agencies.

**Timeline:** The lead agencies are currently working on a contract to develop a joint environmental review process.

**Outcome:** Joint state and federal environmental reviews and documents, and permit letters for three proposed desalination projects: CalAm, DeepwaterDesal, and People’s of Moss Landing

**Partners:** CPUC, CSLC, MLHD, California Coastal Commission, California Regional Water Quality Control Board, CA State Water Board.

## **HABITAT**

- **Southern California Seafloor Mapping Initiative – CINMS**

**Purpose:** Coastal zone and fisheries managers depend on fine scale bathymetry and habitat maps for an array of critical decisions, including navigational safety, disaster response, endangered species and fisheries management, conservation, research, energy development, and marine planning. Yet, in southern California nearly 90% of U.S. marine waters remain unmapped at an appropriate resolution. Within CINMS that number is over 50%, with the majority characterized by single beam and lead line data from the 1930s. To address this critical information gap, CINMS hosted two workshops in 2015 and 2016, bringing together offices across the NOAA family, and state and other federal partners to fill the gaps in seafloor data.

**Outcome:** Over 5,000 km<sup>2</sup> of seafloor mapping has occurred since the workshop, producing high resolution seafloor bathymetry and backscatter data as well as derived products such as habitat maps, rugosity, and other measures of seafloor complexity. Within CINMS alone, over 70% of the sanctuary now has high-resolution multibeam bathymetry and backscatter coverage. CINMS also just released a technical report *Southern California Seafloor Mapping Initiative: Identifying the Gaps and Prioritizing Future Efforts*. This report summarizes results from an August 2015 mapping workshop focused on identifying seafloor mapping requirements and prioritizing acquisition efforts.

**Timeline:** Ongoing.

**Partners:** Over 20 individuals representing 20 agencies/NGOs/academic institutions have actively aided in the mapping effort to-date. Entities include California Ocean Protection Council, Bureau of Ocean Energy Management, U.S. Geological Survey, multiple offices within NOAA, Southern California Coastal Ocean Observing System, The Nature Conservancy, Monterey Bay Aquarium Research Institute (MBARI), Channel Islands National Park, University of California, Santa Barbara, U.S. Navy, California State University Monterey Bay, CDFW, Ocean Exploration Trust, U.S. Army Corps of Engineers, and California Coastal Commission.

- **Seafloor Habitat Characterization - OCNMS**

**Purpose:** OCNMS has been working with the State of Washington and other stakeholders to define priorities for developing detailed seafloor characterization products to help inform marine spatial planning and other ocean management issues. Based on a prioritization process led by the State of Washington in 2015, OCNMS has led an effort to map habitats within the sanctuary and other coastal areas based on those priorities.

**Outcome:** Sanctuary staff have created a seafloor atlas, available at <http://olympiccoast.noaa.gov/science/habitatmapping/habitatmapping.html>, which provides a fine-scale map based on 35 multibeam and sidescan sonar surveys conducted from 2000 to 2013 in the northern sanctuary. As new surveys are completed, they will be added to the seafloor atlas. In May 2016, a team of experts from the College of Charleston, University of Washington and Oregon State University contributed to a NOAA-led, multi-disciplinary survey of Quinault Canyon in Olympic Coast National Marine Sanctuary using the NOAA Ship RAINIER. The survey gathered swath bathymetry, acoustic backscatter and water column data to help inform ocean management. Surveys revealed rocky outcrops along the canyon rim and a remarkable number of methane plumes throughout the water column. The RAINIER survey sets the stage for future ground truthing surveys by Remotely Operated Vehicles (ROVs) that will further investigate the release of methane at different depths and the presence of biogenic habitats on the previously unmapped ridges of the Quinault Canyon.

**Timeline:** Ongoing with additional surveys of Quinault canyon planned on R/V RAINIER in 2017, to be followed up with more detailed characterization of canyon habitats in summer 2017 off the E/V NAUTILUS. OCNMS has also submitted priorities to the NOAA fleet allocation system for outyears (2017-2019) to continue habitat mapping of the sanctuary.

**Partners:** Makah Tribe, Quileute Tribe, Hoh Tribe, Quinault Indian Nation, Washington Department of Ecology, Washington Department of Natural Resources, WDFW, NMFS, University of Washington, Oregon State University, NOAA's Coast Survey, Bob Ballard/Ocean Exploration Trust.

- **Joint Development of Habitat Framework for Washington's Outer Coast – OCNMS**

**Purpose:** In 2015, the Olympic Coast Intergovernmental Policy Council (IPC), composed of the Makah Tribe, Quileute Tribe, Hoh Tribe, Quinault Indian Nation, WDFW, and OCNMS, agreed to work together on an initiative to create a common understanding of all information sources regarding habitat and its role in supporting marine ecosystems for the outer coast of Washington. Known as the 'Habitat Framework', the project aims to develop a comprehensive catalog to inform ecosystem-based management, identify and protect important habitats, enhance coastal and marine spatial planning, and support other efforts to improve our understanding and protection of important marine resources. By creating a common information base, conflicts over issues such as defining essential fish habitat (EFH), should be reduced. The Habitat Framework describes habitat in terms of density, productivity and use; indicates whether there is an absence of data; and also builds-in other information sources in GIS. The Habitat Framework uses NOAA's Coastal Marine Ecological Classification System

(CMECS) developed by the Federal Geographic Data Committee; this project will be the largest application of CMECS to date.

**Outcomes** In 2016, IPC technical staff and subject matter experts formed a Habitat Framework Technical Team to identify resources both inside and outside of NOAA to accomplish the work. The subject matter experts contributed data for two (seafloor geomorphology and sediments) of the four components of the CMECS classification. NatureServe was contracted to combine these two data layers into CMECS Ecological Marine Units (EMUs), a geophysical expression of the seafloor's structure and overlying sediments. EMUs are the first products that will test the function and applicability of broad-scale ecosystem mapping programs within the Habitat Framework concept.

**Timeline:** In 2015-2016 the IPC developed a work plan for creating the Habitat Framework. The coastal tribes are currently reviewing the CMECS EMUs and determining next steps.

**Partners:** Makah Tribe, Quileute Tribe, Hoh Tribe, Quinault Indian Nation, WDFW, and NMFS.

**Other Information of Interest:** Status updates of the Habitat Framework have been presented to the Council. This project may help with defining EFH in the future.

- **Habitat Characterization - CBNMS and GFNMS**

(<http://sanctuaries.noaa.gov/science/conservation/benthic-characterization-cb-gf.html>)

**Purpose:** Very little of the seafloor habitat off of northern California has been explored and even less is characterized using visual survey techniques, especially deep-water habitats. The goals of benthic surveys using a Phantom HD2 ROV were to characterize deep-water benthic habitats, ground truth predicted habitat classifications, ground truth predictive habitat suitability models for coral and fish occurrence, and contribute to education and outreach about deep-water habitats. The sampling scheme was designed to characterize three classes of habitat predicted by multibeam sonar data: 1) hard-rugose (high-relief, hard bottom), 2) hard-flat (low-relief, hard bottom), and 3) soft-flat (low relief, soft bottom). The surveys were conducted September, 2014 off the coast of Sonoma County, CA, at dive targets near Bodega Canyon and on a rocky feature informally named the 'Football.' The targeted sites are within the northern areas recently added to CBNMS and GFNMS. Information was collected to establish a baseline characterization of these areas and to better inform researchers and the sanctuaries' managers of these deep-water ecosystems.

**Outcome:** A total of 20 transects were conducted, nine at the Bodega Canyon site and 11 at the Football at depths ranging from 180 to 306 meters. At Bodega Canyon, at least 30 taxa of fish, 6 coral taxa and 6 sponge taxa were observed. At the Football, at least 34 taxa of fish, 5 coral taxa and 4 sponge taxa were observed. At the Football, a large sedimentary rock outcrop slope was observed with many ledges and overhangs providing an ideal habitat for invertebrates and hundreds of rockfish. A sea whip commonly seen while surveying the Football was collected and determined to be a new species *Swiftia farallonesica*. Other interesting observations included large aggregations of catshark and skate egg cases at the Football. Derelict fishing gear was observed at both sites. The survey report can be found online: *Benthic Characterization of Deep-Water Habitat in the Newly Expanded Areas of Cordell Bank and Greater Farallones National Marine Sanctuaries* (2016).

**Timeline:** Future benthic habitat surveys are being planned for 2017 and 2018 the Ocean Exploration Trust and other partners.

**Partners:** National Centers for Coastal Ocean Science, U.S. Geological Survey, and California Academy of Sciences.

- **Coordination to modify groundfish EFH and Rockfish Conservation Areas (RCAs)**

**Purpose:** A central objective of national marine sanctuaries is resource protection, including protection of biodiversity and ecosystem health. As such, protecting groundfish EFH and RCAs from adverse impacts from fishing is aligned with sanctuary goals. The five west coast sanctuaries work diligently to characterize the status of benthic habitat in national marine sanctuaries (see recent findings in this report), including the status of EFH. Newly collected benthic habitat data, since the implementation of groundfish EFH, formed the basis of information of proposals submitted to the Council. The sanctuary proposals submitted by MBNMS, GFNMS and OCNMS (subsequently withdrawn), sought to identify and protect sensitive biogenic habitat from trawl gear impacts and also to identify and re-open and return areas of soft bottom habitat that are valuable historical fishing grounds to the bottom trawl fleet. The following is an overview of the EFH proposals and activities conducted by national marine sanctuaries:

- **MBNMS:** The goals of the 2013 MBNMS proposal are to protect additional sensitive habitats that were overlooked during the 2006 review, while improving fishing opportunities for the bottom trawl fleet relative to the current array of EFH Conservation Areas. Modifications to the RCA were not considered until 2016, when one additional area (head of Ascension Canyon) was agreed upon by the MBNMS collaborative and added to the Coastwide Collaborative proposal.

**Outcome:** Incorporation of the MBNMS proposal into the Coastwide Collaborative proposal, and GIS maps and benthic habitat data for the EFH review.

**Timeline:** The MBNMS collaborative proposal is incorporated into the Coastwide Collaborative proposal currently being analyzed by NMFS for a decision by the Council in 2017.

**Partners:** The MBNMS proposals was developed in collaboration by MBNMS Advisory Council representatives (Harbors and Commercial Fishing), Alliance of Communities for Sustainable Fisheries, Monterey Bay trawl fishermen, the City of Monterey, Oceana, Natural Resources Defense Council, Ocean Conservancy, The Nature Conservancy, the California Groundfish Collective (used to be CA Risk Pool) and Environmental Defense Fund.

- **GFNMS:** The goals of the 2013 GFNMS proposal are to protect Rittenberg Bank, previously overlooked during the 2006 EFH designation process, and to protect newly identified sensitive habitat areas discovered at Cochrane Bank and the Farallones Escarpment.

**Outcome:** Most elements of GFNMS proposal have been incorporated into the Coastwide Collaborative proposal, and GIS maps and benthic habitat data have been added to the EFH review process.

**Timeline:** The proposed boundaries of the EFH Conservation Area at Rittenberg Bank, and the remaining elements of the GFNMS proposal as part of the Coastwide Collaborative proposal are currently being analyzed by NMFS for a decision by the Council in 2017.

**Partners:** GFNMS staff coordinated with local stakeholders and fishermen while developing the GFNMS proposal, but were not able come to consensus when the

- proposal was submitted in 2013. Since then, GFNMS staff have continued to coordinate with local fishermen and stakeholders, and representatives of the Coastwide Collaborative.
- **CBNMS:** Staff from CBNMS coordinated with the Coastwide Collaborative to include benthic habitat data on the scale of CBNMS and consideration of habitat protection goals from CBNMS into the Coastwide Collaborative proposal. Managers at CBNMS recommended opening an area currently closed to bottom trawling on the continental shelf, and to close a few areas to bottom trawling that are in close proximity of Cordell Bank.
  - **CINMS and OCNMS:** Staff from CINMS and OCNMS coordinated with representatives of the Coastwide Collaborative by sharing seafloor habitat data and the habitat protection goals of the respective national marine sanctuaries.
- **Deep Sea Coral Restoration Study - MBNMS**  
**Purpose:** To develop coral transplant techniques for deep-sea coral restoration, and restore an area that has been previously impacted by trawling. These techniques may be useful in restoration of areas, especially those impacted by the British Petroleum spill in the Gulf of Mexico. Branch clippings from large individual *Paragorgia* and *Isidella* corals (n = 76) have been successfully taken and transplanted on Sur Ridge, in MBNMS. This novel technique needs to be further refined and clearly documented. In the next phase, suitable coral transplants will be made to areas previously impacted by trawling. Survival and growth of the coral transplants and ecological descriptions of the surrounding areas will be monitored through time.  
**Outcome/Timeline:** By June 2018, publish a methods manual for transplanting deep-sea corals. Begin implementing restoration in formerly trawled areas (near Sur Ridge or Monterey Bay) in December 2018.  
**Partners:** MBARI

## **RESEARCH AND MONITORING**

- **Sanctuaries Marine Biological Observation Network - MBNMS and Florida Keys National Marine Sanctuary (FKNMS)** (<http://www.marinebon.org>)  
**Purpose:** The Marine Biological Observation Network (MBON) is focused on integrating data from existing long-term observing programs and developing new observing methods (e.g. sampling environmental DNA from marine waters) to improve our understanding of changes in and connections between marine biodiversity and ecosystem functions. MBNMS and FKNMS serve as sentinel sites for monitoring marine biodiversity of coastal, shelf and deep-sea ecosystems.  
**Outcome:** The sanctuaries MBON demonstration project is in the process of developing a number of products including:
  - A data catalog (<http://mbon.ioos.us>) of in situ and remotely-sensed physical, chemical and biological observations focused on biodiversity, from microbes to whales, and habitat characterization in MBNMS and FKNMS.
  - An on-line data portal to improve access to data and support integration, visualization and analysis of observing data.
  - Key indicators and indices of biodiversity status and trends for sanctuary condition reports.

- A process to dynamically update MBON information for sanctuary status and trend reports.
- Innovative molecular (e.g., environmental DNA) and remote sensing technologies, and methods for observing marine biodiversity.

**Timeline:** The MBON project was initiated in 2014 and is projected to be carried out for 5 years through 2019.

**Partners:** MBARI, ONMS, MBNMS, FKNMS, NMFS (SWFSC & SEFSC), IOOS, CeNCOOS, California Current Integrated Ecosystem Assessment (CCIEA), Woods Hole Oceanographic Institution, University of South Florida, Stanford University, Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute, Ocean Biogeographic Information system (OBIS) and others. The MBON project is funded under the National Ocean Partnership among NOAA, BOEM, and NASA, with the U.S. Integrated Ocean Observing System (U.S. IOOS) program pioneering the implementation.

- **Biological Response at the MPA Network of CINMS**

([http://www.piscoweb.org/files/CI\\_10-Yr\\_Brochure\\_web.pdf](http://www.piscoweb.org/files/CI_10-Yr_Brochure_web.pdf) and [http://www.piscoweb.org/files/CI\\_10-Yr\\_Brochure\\_web.pdf](http://www.piscoweb.org/files/CI_10-Yr_Brochure_web.pdf))

**Purpose:** Designated in phases (2003, 2006 and 2007), the network of Channel Islands MPAs was designed to help rebuild depressed populations, restore biodiversity and improve ecosystem health by protecting habitats and living resources. CINMS provides continuing support for ongoing monitoring of the network, learning from results to better understand the efficacy of these protected zones. Understanding the impact of MPAs on ecosystem condition has been a focus of long-term monitoring efforts by scientists at universities, government agencies and non-profit organizations, working in partnership with the sanctuary.

**Outcome:** The first five-year evaluation of the Channel Islands MPAs occurred in 2008. An additional five years of monitoring show that in general, biomass and abundance of targeted species are increasing at a higher rate inside reserves compared to reference areas open to fishing. The Channel Islands National Park and PICSCO have been tracking changes in kelp forest and shallow rock habitats in CINMS, both inside and outside of MPAs. The monitoring results show changes in algal, invertebrate and fish species in the region, specifically:

- Average biomass of species targeted by fishing, such as rockfish, kelp bass and lobster, has increased both inside and outside of MPAs since their implementation. The rate of increase is much greater inside MPAs where fishing is not allowed;
- Increased biomass inside marine reserves (the no-take MPAs), known as the 'reserve effect,' results from larger-sized individuals (e.g., kelp bass, sheephead) and higher densities (more individuals in the same size area) inside MPAs (*PISCO* 2013);
- The reserve effect is more consistently observed for species subject to high fishing pressure, such as California spiny lobster, sea cucumber and sheephead. Unfished and lightly fished species show no consistent patterns relative to protection; some are more abundant inside and some are more abundant outside MPAs.

This pattern of higher biomass of targeted species inside MPAs is fairly consistent among the four islands surveyed despite strong biogeographical patterns across the Channel Islands. Although there was significant variation in average biomass of targeted and non-targeted species among islands, the positive reserve effect was observed at most islands.

San Miguel Island, which is the coldest and most distant from ports, showed no significant difference in fished species biomass inside and outside the reserve. This highlights the fact that environmental conditions, fishing patterns, and other variables are important to consider when evaluating MPA performance.

Repeated visual surveys of mid-depth rock and subtidal soft-bottom inside and outside of MPAs in CINMS at depths of 20-80 m have been conducted using ROVs. These habitats are home to many commercially and ecologically important species, such as lingcod, sheephead and many species of rockfish. Similar to the patterns observed for kelp forest and shallow rocky reef habitats, overall biomass of demersal fishes increased over time, and the magnitude of increase was higher inside of MPAs for some harvested fish species. Specifically:

- A 250% increase in total fish per kilometer was observed in 2014 compared to the annual average count from baseline surveys conducted in 2005-2009.
- The average density of four targeted fish species increased both inside and outside of MPAs, but the magnitude of increase was higher inside MPAs.

Additional processing and analysis of ROV videos is needed to determine trends in abundance of additional fish and invertebrate species, and to compare patterns across targeted and non-targeted species.

Specific products summarizing monitoring results:

- California Department of Fish and Game (CDFG), PISCO, Channel Islands National Marine Sanctuary (CINMS), & Channel Islands National Park (CINP). (2008). *Channel Islands Marine Protected Areas: First 5 Years of Monitoring: 2003–2008*. 20 pp.
- PISCO (2013). *A Decade of Protection: 10 Years of Change at the Channel Islands*.

**Timeline:** Ongoing monitoring.

**Partners:** Channel Islands National Park, PISCO and Marine Applied Research and Exploration (MARE).

- **Restoration of White Abalone – CINMS**

([http://www.fisheries.noaa.gov/pr/species/Species%20in%20the%20Spotlight/white\\_abalone\\_spotlight\\_species\\_5-year\\_action\\_plan\\_final.pdf](http://www.fisheries.noaa.gov/pr/species/Species%20in%20the%20Spotlight/white_abalone_spotlight_species_5-year_action_plan_final.pdf))

**Purpose:** According to NMFS, surveys conducted in southern California show that at least a 99% reduction in white abalone (*H. sorenseni*) density has occurred since the 1970s. Once occurring in numbers as high as 1/m<sup>2</sup> of suitable habitat, recent surveys show that densities average 1/hectare (10,000 m<sup>2</sup>) in the Channel Islands off southern California. NMFS and partners have developed a four- step restoration plan: 1) locate surviving white abalone by surveying historical habitat; 2) collect broodstock; 3) breed and rear a new generation of juveniles and ultimately, broodstock; and 4) reestablish refugia of self-sustaining brood stocks in the wild. As the marine habitat surrounding the Channel Islands may support endangered white abalone and could serve as suitable habitat for restoration efforts, CINMS staff have been supporting field-operations of the restoration plan. The assistance has included use of the sanctuary vessel SHEARWATER to conduct dive trips to survey for white abalone and suitable habitat, with sanctuary staff divers participating. As noted above, the recent nomination of Southern California Offshore Banks National Marine Sanctuary recognizes the importance of protecting the remaining white abalone populations at Tanner and Cortes Banks.

**Outcome:** A strong partnership between NMFS and ONMS in the restoration of white abalone.

**Timeline:** Ongoing. Vessel operations and diving to be conducted as requested by project leads at NMFS.

**Partners:** Lead partners are the NMFS West Coast Region, NMFS Southwest Fisheries Science Center, U.S. Navy, and CDFW. CINMS is a supporting partner, providing on-water support. Other partners include: Citizen Science Group of San Diego, Occidental College, Channel Islands National Park, The Bay Foundation, Bodega Marine Laboratory, Get Inspired, Puget Sound Restoration Foundation, and the University of Washington.

## **RECREATIONAL FISHING**

- **Recreational Fishing Summit of December 2016**

**Purpose:** All west coast national marine sanctuaries have fishermen representing commercial and or recreational fishing interests on the sanctuary advisory councils. In December, 2016 ONMS convened a National Marine Sanctuary Advisory Council Recreational Fishing Summit. The purpose of this summit was to engage with the nation's recreational fishing constituency, as represented by their respective national marine sanctuary advisory councils, to discuss recreational fishing in sanctuaries and steps forward to improve the relationship between recreational fishermen and NOAA. ONMS seeks to learn more about the common perceptions about and ideal fishing experiences in national marine sanctuaries.

**Outcome:** Summit participants agreed to six common statements or perceptions based on what was discussed over two days, and ONMS leadership committed to a series of actions ONMS staff would take to further the relationship with recreational fishermen. One such statement and desired action is securing opportunities for recreational fishermen to collaborate with NOAA on science and education projects. Consequently, ONMS and NMFS have committed to coordinating on Cooperative Research Program activities with recreational fishermen in national marine sanctuaries.

**Timeline:** The common statements and perceptions are meant to memorialize the beginning, not the end, of a long-term dialogue and engagement between NOAA and recreational fishermen.

**Partners:** Recreational fishing representatives of national marine sanctuary advisory councils, NMFS, and ONMS.