
CORDELL BANK
NATIONAL MARINE SANCTUARY



DRAFT MANAGEMENT PLAN

UPDATED IN RESPONSE TO THE PROPOSED SANCTUARY EXPANSION

UPDATED APRIL 2014

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE
OFFICE OF NATIONAL MARINE SANCTUARIES





NATIONAL MARINE
SANCTUARIES™

CORDELL BANK

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NATIONAL MARINE SANCTUARY
DRAFT MANAGEMENT PLAN**

Updated April 2014



The Cordell Bank National Marine Sanctuary (CBNMS) Management Plan has been updated in response to the proposed sanctuary expansion. A sanctuary management review is conducted at a sanctuary periodically, in accordance with the National Marine Sanctuaries Act (NMSA; 16 U.S.C. 1431 et seq.). The draft updated plan applies to the entire area encompassed by the existing sanctuary and the proposed expansion area. The issue areas and programs addressed in this document were built with guidance from the general public, sanctuary staff, agency representatives, experts in the field and the sanctuary advisory council.

For readers who would like to learn more about the management plan, CBNMS policies and community-based management processes, we encourage you to visit our website at www.cordellbank.noaa.gov. Readers who do not have Internet access may call the Sanctuary office at (415) 663-0314 to request relevant documents or further information.

The National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries (ONMS) seeks to increase public awareness of America's ocean and Great Lakes treasures by conducting scientific research, monitoring, exploration and educational programs. Today, the program manages thirteen national marine sanctuaries and one marine national monument that together encompass more than 170,000 square miles of America's ocean and Great Lakes natural and cultural resources.

The NOAA Ocean Service is the umbrella organization for ONMS and is dedicated to exploring, understanding, conserving and restoring the nation's coasts and oceans and works to balance environmental protection with economic prosperity in its mission promoting safe navigation, supporting coastal communities, sustaining coastal habitats and mitigating coastal hazards.

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Black-footed albatross (*Phoebastria nigripes*) –Rich Stallcup
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PROPOSED NEW BOUNDARIES FOR CORDELL BANK NATIONAL MARINE SANCTUARY

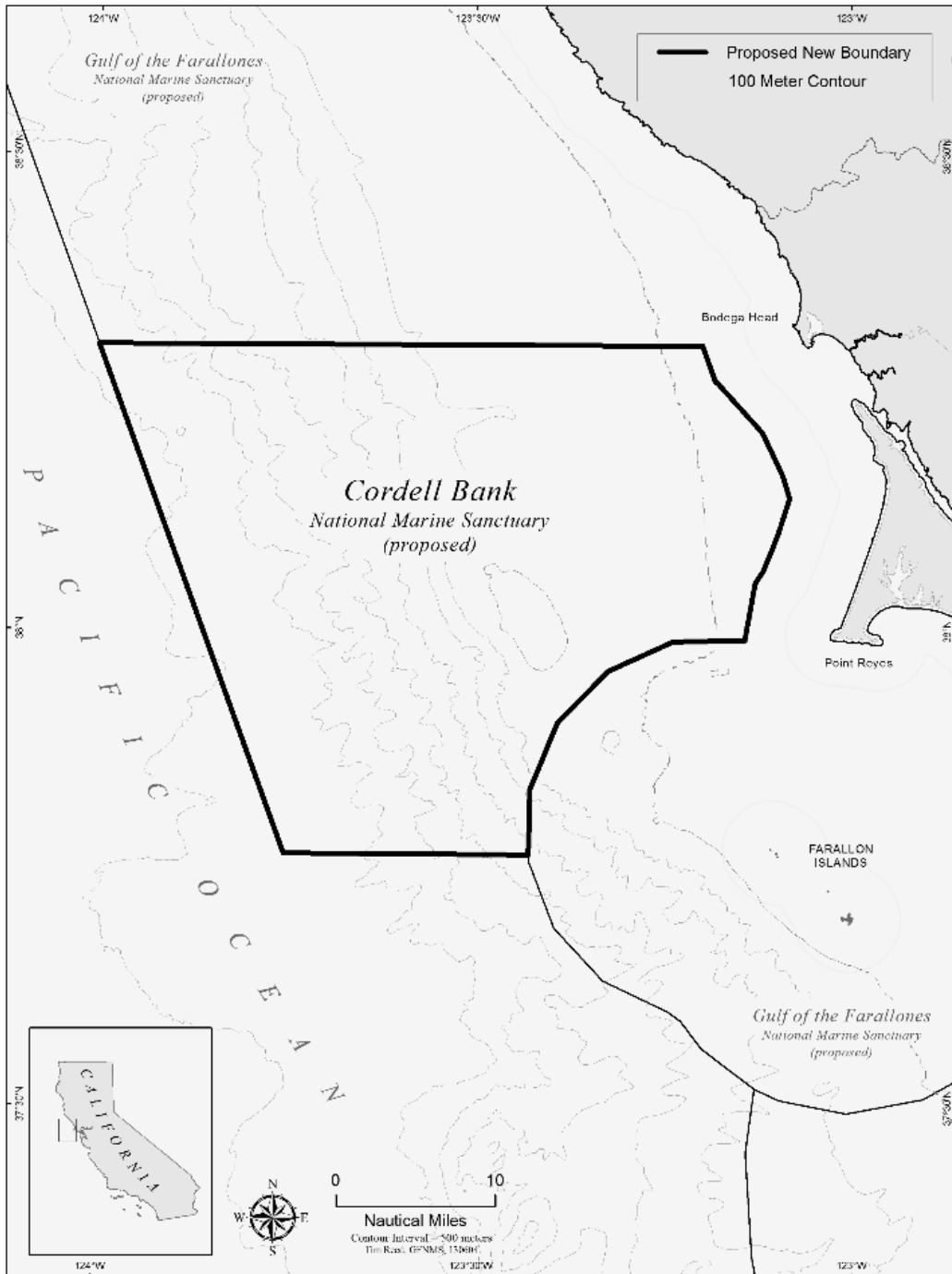


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EXECUTIVE SUMMARY

Current Status

This document is a draft update to the management plan for Cordell Bank National Marine Sanctuary (CBNMS). The National Oceanic and Atmospheric Administration (NOAA) prepared the management plan in cooperation with sanctuary staff, the public, state and federal agencies, stakeholders, and the Cordell Bank National Marine Sanctuary Advisory Council. The last version of the management plan was published in 2008, and has been updated in response to the proposed sanctuary expansion of CBNMS. The entire management plan has not been rewritten; the plan will be reviewed five years after the expansion is effective (if applicable).

CBNMS Designation

CBNMS has been vested with the authority, in accordance with the National Marine Sanctuaries Act (NMSA) to provide comprehensive and coordinated conservation and management of the marine resources on the continental shelf and slope, from about 7 to 51 miles (6 to 44 nautical miles) west of Bodega Head, California and about 52 miles (45 nautical miles) west-northwest of San Francisco. The total area of the sanctuary is 1286 square miles. This is an area of special significance due to unique geology and oceanic features that create conditions that support an extraordinarily diverse and abundant marine community, and thus was designated a national marine sanctuary in 1989. Cordell Bank is an offshore granite bank approximately 4.5 miles wide by 9.5 miles long (3.9 nautical miles wide by 8.3 nautical miles long). The rocky bank emerges from the soft sediments of the continental shelf, with the upper pinnacles reaching within 115 feet of the ocean's surface. Shelf depths at the base of the Bank range from 300 to 400 feet deep. Another significant feature of the sanctuary is Bodega Canyon, which is north of the Bank. The Canyon is about 12.4 miles (10.8 nautical miles) long and is over 5,000 feet deep.

History of Management Plans for CBNMS

The specific requirements of the CBNMS 1989 management plan were compatible with the overall sanctuary management concept embodied in the NMSA and its implementing regulations (15 CFR, Part 922), which require that a management plan be prepared for each national marine sanctuary. This original management plan, developed at the time of designation of the sanctuary in 1989, provided guidelines to ensure that all management actions undertaken in the first five years of designation were directed to resolving important issues as a means of meeting CBNMS objectives. Management objectives were considered in three areas: resource protection, interpretation, and research. The management plan also called for promulgation of five regulations or prohibitions.

The 1992 amendments to the NMSA required that each of the national marine sanctuaries engage in a management plan review process periodically to reevaluate site-specific goals and objectives, management techniques, and strategies. The Office of National Marine Sanctuaries (ONMS) reviewed the management plans of Cordell Bank, Gulf of the Farallones, and Monterey

Bay national marine sanctuaries (CBNMS, GFNMS and MBNMS) jointly, and published management plans for each site in 2008. These sanctuaries are located adjacent to one another, are both managed by ONMS), and share many of the same resources and issues. In addition, all three sites share some overlapping interest and user groups. It was cost effective for the ONMS to review the three sites jointly, rather than conducting three independent reviews.

The management plan review process provided CBNMS with the opportunity to: take a closer look at environmental changes; better understand the cause and effect relationship of human activity and natural perturbations on the marine resources; and engage the public in the management decision making process. As a result of this process, CBNMS reshaped how it manages sanctuary resources, from restructuring its program areas to updating its regulations.

The boundary expansion for CBNMS was both envisioned in an action plan strategy in the 2008 management plan (strategy AD-11 in that plan), and was also proposed legislatively for eight years by Representative Lynn Woolsey and Senator Barbara Boxer. As part of its efforts to evaluate the resource protection and other benefits from such a boundary expansion, NOAA has produced an updated management plan built upon the 2008 CBNMS final management plan. Not all action plan strategies have been updated; many actions are ongoing, and some have been revised. The overall action plans and ONMS requirements will apply to the expanded CBNMS, if applicable.

Five action plans specific to CBNMS are contained in the management plan:

1. Education and Outreach
2. Resource Protection
3. Partnerships with Community Groups
4. Conservation Science
5. Administration

Updates to the 2008 management plan include: revisions to the description and map of CBNMS; technical corrections, including removal of obsolete text and completed actions and additions relevant to the expanded sanctuary area; renaming the Ecosystem Protection Action Plan the Resource Protection Plan; moving the enforcement, emergency response and regulations and permitting activities from the Administration Action Plan to the Resource Protection Plan; adding an activity regarding ship strikes of whales to the Resource Protection Plan; adding an activity to encourage and assist local and regional entities in improving the availability and use of pump-out facilities and dump stations for vessels; adding an activity to evaluate specific previously proposed research activities to the Conservation Science Plan; summarizing key partners at the action plan and cross-cutting action plan level rather than at the strategy level; deletion of specific products; revision of action plan former timelines and budgets into a summary implementation table in the Administration Action Plan; and updates to the species list appendix.

INTRODUCTION

OVERVIEW

Background about the Sanctuary

Cordell Bank National Marine Sanctuary (CBNMS) has been vested with the authority, in accordance with the National Marine Sanctuaries Act (NMSA), to provide comprehensive and coordinated conservation and management of the marine resources surrounding Cordell Bank off the north-central coast of California. CBNMS is characterized by a combination of undersea topography and oceanic conditions that provide for a highly productive environment in a discrete, well-defined area. The Bank consists of a series of steep-sided ridges and narrow pinnacles resting on a plateau 300 to 400 feet deep. The shallowest depth on Cordell Bank is 115 feet below the sea surface, yet only a few miles to the west there are water depths of 6,000 feet. Another important feature of CBNMS is Bodega Canyon, which is north of the Bank. The Canyon is about 12.4 miles (10.8 nautical miles) long and over 5,200 feet deep. CBNMS protects an area of 1286 square miles (mi²) (971 square nautical miles).

Point Arena is one of the major upwelling centers along the west coast of the United States. Prevailing currents push nutrients from upwelling southward along the coast, moving nutrients and other prey over the upper levels of the Bank. These highly productive waters sustain a vigorous biological community that includes various algae and numerous invertebrates, fishes, marine mammals, sea turtles and seabirds. The combination of sedentary plants and animals typical of nearshore waters in close proximity to open ocean species like blue whales and albatross creates a rare mix of species and a unique biological community at Cordell Bank. Bodega Canyon is a prominent submarine feature in close proximity to Cordell Bank. This seafloor feature cuts across the continental shelf and slope about 10 miles (8.5 nautical miles) north of Cordell Bank. Submarine canyons provide areas of high bathymetric complexity, support deep water communities, and affect local and regional circulation patterns. Bodega Canyon provides habitat for adult stages of groundfish including rockfish and flatfish that rear in nearshore waters and move offshore in their adult stages. Limited work in Bodega Canyon revealed mud draped hard bottom on the canyon edges with deep corals and fishes associated with the hard substrate (CBNMS unpublished report). In addition, offshore canyons and other bathymetric features are important foraging areas for seabirds and marine mammals (Yen et al. 2004¹).

The eastern edge of the sanctuary is located about 7 miles (6 nautical miles) from shore at Point Reyes and is separated from the coast of Marin and Sonoma counties by Gulf of the Farallones National Marine Sanctuary (GFNMS). The coastal areas of west Marin and Sonoma counties are sparsely populated, with ranching, dairy farms, agriculture, and public open space maintaining

¹ Yen, P.W., W.J. Sydeman, and K.D. Hyrenbach. 2004. Marine bird and cetacean associations with bathymetric habitats and shallow-water topographies: implications for trophic transfer and conservation. *Journal of Marine Systems* 50 pp. 79 – 99.

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the rural character. Bodega Bay is a fishing port that harbors the closest marinas to the sanctuary. The harbor also serves as the departure point for charter vessels that provide recreational fishing and wildlife viewing opportunities in the sanctuary, although access to the sanctuary is often limited by unfavorable sea conditions.

History of CBNMS

In July 1981, the National Oceanic and Atmospheric Administration (NOAA) received a recommendation to establish Cordell Bank as a National Marine Sanctuary from Cordell Expeditions, a non-profit organization dedicated to the exploration and description of the Bank. NOAA evaluated the recommendation in accordance with the requirements of the National Marine Sanctuary Program (now Office of National Marine Sanctuaries or ONMS) regulations (15 CFR 922). Cordell Bank was found eligible for inclusion on the List of Recommended Areas (LRA) and was placed on the LRA in 1981. More complete information on the site was collected by NOAA and incorporated into a resource summary and site description that was distributed to the public and agencies for comment in 1982. It was determined that Cordell Bank was an area of special significance that was not adequately protected. The final rule went into place in 1989, and Cordell Bank was designated a national marine sanctuary. The proposal to expand CBNMS was initiated with a notice in the *Federal Register* on December 21, 2012. The boundary expansion for CBNMS was both envisioned in an action plan strategy in the 2008 management plan (strategy AD-11 in that plan), and was also proposed legislatively for eight years by Representative Lynn Woolsey and Senator Barbara Boxer. The proposed expansion would protect a total of 1286 mi² (971 square nautical miles) which is an increase of 757 mi² to the existing sanctuary (572 square nautical miles).

The operation and management of CBNMS was originally combined with that of the adjacent GFNMS, then known as the Point-Reyes Farallon Islands National Marine Sanctuary. Under this approach, the management of the research, education, and resource protection programs was a collateral function of the GFNMS manager. In 1998, a separate budget was allocated to manage CBNMS independently of GFNMS and over the next few years additional staff members were hired along with a sanctuary superintendent in 2003.

The original management plan, developed at the time of designation of the sanctuary, provided guidelines to ensure that all management actions undertaken in the first five years of designation were directed to resolving important issues as a means of meeting sanctuary objectives. Management objectives were considered in three areas: resource protection, interpretation, and research. The management plan also called for promulgation of five regulations or prohibitions.

THE CBNMS MANAGEMENT PLAN

The overall management of CBNMS is carried out through two complementary elements: regulatory and non-regulatory. The regulatory component includes both site-specific regulations or prohibitions and general regulations that apply to all thirteen national marine sanctuaries. Regulations are used to control or restrict human behavior that is not compatible with resource protection. The non-regulatory component is largely described in the management plan and

includes CBNMS's three program areas: Education and Outreach; Conservation Science; and Resource Protection. These three program areas are supported by an administrative framework that ensures all resource management activities are coordinated and provides an appropriate infrastructure to help meet the goals and objectives set forth by this management plan. Collectively, the above-mentioned parts make up the whole of the management plan and all the parts are important tools for effective resource management.

The management plan is structured to address the priority resource management issue areas identified during the Joint Management Plan Review (JMPR), which include the three program areas mentioned above as well as partnerships with community groups and administration.

The spatial context for addressing these issues is not limited by the geographically drawn, and often politically driven, boundaries of just a single sanctuary, but is across CBNMS, GFNMS, and Monterey Bay National Marine Sanctuary (MBNMS) as well as areas outside these sanctuaries. For that reason, the cross-cutting action plans were developed as a result of the JMPR. The goals of these cross-cutting action plans are to build upon existing coordination efforts and identify activities that should be jointly implemented so that these three sanctuaries can operate as integrated and complementary sites to better protect the sanctuary resources. This ensures scarce program resources are used more efficiently and that the result is more consistent and coordinated delivery of programs, products and services to the public. The priority cross-cutting action plans include: Administration and Operations Community Outreach; Ecosystem Monitoring; and Maritime Heritage.

Management Plan Reviews

The 1992 congressional legislation that reauthorized the NMSA required that each of the national marine sanctuaries engage in a management plan review process to reevaluate site-specific goals and objectives, management techniques, and strategies. The periodic management plan review process allows national marine sanctuaries the opportunity to: take a closer look at how the environment has changed; better understand the cause and effect relationship of human activity and natural perturbations on the marine resources; and engage the public in the management decision making process. As a result of the JMPR, in 2008 CBNMS reshaped how it manages the marine resources by restructuring its program areas and regulations. Management issues are complicated by many factors including: incomplete ecosystem-based scientific knowledge on which to base decisions; the diversity of uses and interests that need to be considered; the environmental, social, economic, and cultural value of the resources; and the complexity and diversity of the marine resources themselves.

The management plans of CBNMS, GFNMS, and MBNMS were jointly reviewed as part of the JMPR, and were published in 2008 with the Final Environmental Impact Statement (FEIS) for each sanctuary. These sanctuaries are located adjacent to one another, are managed by the same NOAA office, and share many of the same resources and issues. In addition, all three sites share some overlapping interest and user groups. During the review, the sanctuaries evaluated management and operational strategies, regulations, and boundaries. The review process (described at http://sanctuaries.noaa.gov/jointplan/jmpr_faq.html) provided an opportunity to

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better coordinate programs among the three sanctuaries, and included public and Sanctuary Advisory Council reviews and issue prioritization.

This document is an updated management plan, developed in response to the proposed sanctuary expansion. A Draft Environmental Impact Statement (DEIS) for the proposed expansion is being released for public review with the draft revised management plan. The comments will be considered by NOAA, and, if warranted, a final management plan/final EIS (FEIS) will be released to the public and submitted to Congress and the governor for review. If the expansion proposal process results in sanctuary expansion, following a 45-day review period and completion of any necessary changes, the final management plan and accompanying regulations will become effective.

The Value in Building Community Partnerships

The Sanctuary Advisory Council for CBNMS includes two agency and seven stakeholder representatives, with an alternate for each seat. The Sanctuary Advisory Council provides advice to sanctuary management and serves as a liaison to the community. Sanctuary Advisory Council meetings provide a platform for public input on the management of the marine resources of CBNMS. This partnership has allowed CBNMS to make use of and build on the knowledge, roles, and resources that the private sector and other agencies have to offer. The Sanctuary Advisory Council has also been a vehicle for drawing in public support, making progress through cooperation, and including the community in the decision-making process.

BUILDING A MANAGEMENT PLAN

Vision Statement

The vision, goals, and objectives that follow are based on those in the original management plan. At the commencement of the Jmpr process, CBNMS staff worked together to build a vision for the future of the site that reflects the sanctuary framework and needs. That vision, with small wording changes, still applies today:

CBNMS is characterized by a combination of oceanic conditions and undersea topography that supports rich and diverse marine communities. Two worlds come together at this offshore site: open ocean species thrive in close proximity to a benthic reef community.

CBNMS's highest priority is resource protection. CBNMS takes a leading role in ecosystem management, focusing on biological and physical processes. Together, with our partners, we work to protect biological communities and their habitats. By addressing current management issues and anticipating future challenges to CBNMS, we strive to maintain a healthy marine environment now and for future generations.

CBNMS Goals and Objectives

In order to be consistent with the guiding legislation established in the NMSA, the overriding mandate for the thirteen national marine sanctuaries, CBNMS has the following priority goals:

Improve the conservation, understanding, management, and sustainable use of marine resources;

Enhance public awareness, understanding, and appreciation of the marine environment;

Maintain for future generations the habitat and ecological integrity of the natural assemblage of living resources that inhabit these areas;

Maintain the natural biological communities, protecting and (where appropriate) restoring and enhancing natural habitats, populations, and ecological processes;

Provide authority for comprehensive and coordinated conservation and management of these marine areas and activities affecting them, in a manner that complements existing regulatory authorities;

Create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques; and

Cooperate with global programs encouraging conservation of marine resources.

The management strategies outlined in the plan for CBNMS aim to meet these goals and objectives. It should be noted that although the goals and objectives are listed discretely, they are overlapping. Collectively, the management strategies developed in the management plan address the full range of goals and objectives set forth in the previous paragraph.

Addressing Goals and Objectives within an Ecosystem Context

These priority goals and objectives lead CBNMS to take an ecosystem-based approach to managing a fluid marine environment with great temporal and spatial complexity and diversity. CBNMS's experience during the management plan review process has shown that the scientific community, resource agencies, and the public recognize the importance of an integrated ecosystem-based approach to protect marine biodiversity and habitats. The ONMS's emphasis on marine ecosystem management is consistent with other state and federal agencies' programs and initiatives.

Tools for Effective Management Planning

CBNMS's management plan was built not only to protect the marine resources and biodiversity, but also to consider maintenance of economic equity, cultural integrity, and human social structures. In order to better evaluate human-use activities, their impacts on the resources, and

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compatibility with resource protection, CBNMS used three strategic tools in the development of the management plan: science, socioeconomics, and local knowledge.

Science

Protection of living and nonliving marine resources is the primary objective of the ONMS, and science serves an important role in understanding, measuring, and predicting change in the status of the marine ecosystem. Scientific inventories, research, and monitoring provide an important information base for resource managers to understand and evaluate the effectiveness of management regimes. NOAA collected data from individual researchers and institutions throughout the region and, where possible, integrated it into a Geographic Information System (GIS) to spatially identify significant living and nonliving marine resources, habitats, and physical and geological features. These data were used to help describe and define the ecosystem, identify areas of special significance, and locate important ecosystem support systems.

Socioeconomics

In California alone, ocean industries such as fishing and shipping account for approximately 2 percent of the gross domestic product, amounting to roughly \$800 billion annually. These numbers paint an important picture about the need to properly manage the marine resources. A sustainable community recognizes both ecosystem sustainability and economic sustainability as mutually beneficial. The ONMS considers not only the potential cost of management restrictions on income generating activities, but also public benefits derived from long-term protection of nationally significant resources.

Local Knowledge

Local knowledge represents the voice of direct experience and interaction with the marine resources over time. The knowledge of locals is more extensive and long range than much of the scientific research available for the study area. CBNMS not only honors and incorporates local knowledge, but also realizes stakeholder groups have a deep and integrated respect for the natural world. These local voices represent local interests, issues, and concerns to be balanced against those from the outside. The advisory council, local mariners, and the public provided valuable input to the development and update of this management plan.

Looking at the Next Five Years and Beyond

Since its establishment in 1972, the ONMS has been building models for better marine resource management. But even today, with better knowledge of the natural world and more experience managing human behavior, the ONMS continues to build new models to enhance resource protection. This is why we call the CBNMS management plan a “living document,” serving as a flexible and responsive framework for managing impacts on natural marine systems.

This “living document” also serves as a proactive tool for planning a sustainable future. To ensure a sustainable future, CBNMS’s “living document” will provide a framework for not only

addressing the resource management issues of the present, but also anticipating those emerging issues of the future.

The emergence of new issues and other unforeseeable factors may affect specific aspects of sanctuary management as described in this plan. However, the overall goals, management objectives, and general guidelines will continue to be relevant. The aim is to carefully adjust the plan to changing circumstances in light of the experience gained in actual management. Modification to the scope and scale of the action plans may have to be made due to unforeseeable changes in levels of funding. Again, the goals and objectives of the plan will remain unchanged.

SANCTUARY SETTING

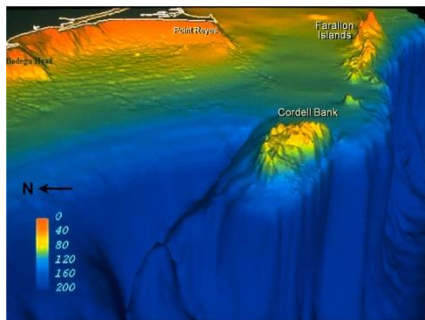
PHYSICAL SETTING

Location

CBNMS protects an area of 1286 mi² (971 square nautical miles) off the north-central California coast. Significant features of the sanctuary include Cordell Bank, an offshore granite bank located on the edge of the continental shelf, about 52 miles (45 nautical miles) west-northwest of San Francisco and 23 miles (20 nautical miles) west of the Point Reyes lighthouse in an open ocean environment, and Bodega Canyon, a prominent seafloor feature that cuts across the continental slope and into the shelf north of Cordell Bank. CBNMS is entirely offshore, in federal waters, and shares its southern, eastern, and northern boundaries with GFNMS. The CBNMS eastern boundary about 7 miles (6 nautical miles) from shore at Bodega Head and the western boundary is on the continental slope about 51 miles (44 nautical miles) west of Bodega Head. CBNMS is located in one of the world's four major coastal upwelling systems. The combination of oceanic conditions and undersea topography provides for a highly productive environment in a discrete, well-defined area. The vertical relief and hard substrate of the Bank provides benthic habitat with nearshore characteristics. Physical and biological processes associated with the Bodega Canyon make this a dynamic oceanographic area.

Geology

Distinctive features that characterize the geology of CBNMS include the shallow granitic Cordell Bank, Bodega Canyon, and the surrounding soft bottom of the continental shelf and slope.



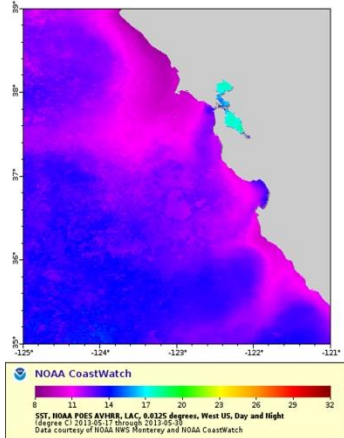
Cordell Bank perches dramatically on the edge of the continental shelf.

Cordell Bank is composed of a granite block that was created as part of the southern Sierra Nevada range some 93 million years ago. The Bank is one of the few offshore areas where the granite block emerges from the newer sediments that make up most of the continental shelf. The Bank itself is about 4.5 miles wide by 9.5 miles long (3.9 nautical miles wide by 8.3 nautical miles long). The Bank meets the continental shelf in water depths between 300 and 400 feet. Jagged ridges and pinnacles rise abruptly from this plain and reach up to 115 feet below the sea surface. In many places, the sides of the ridges and pinnacles are extremely steep, often with slopes greater than 80 degrees (Schmieder 1985²). About 7 miles (6 nautical miles) west of the Bank, the continental slope drops steeply to 6,000 feet and more.

² Schmieder, Robert W. Cordell Bank Expedition Report 1984. Cordell Expeditions, Walnut Creek, CA. November 1985.

Bodega Canyon is a prominent submarine canyon about 10 miles (8.5 nautical miles) north of Cordell Bank. This seafloor feature, which cuts across the continental slope and shelf is about 12.4 miles (10.8 nautical miles) long and over 5200 feet deep. The canyon walls are a combination of mud draped rock and soft sediments. The continental shelf and slope within the sanctuary support a thriving soft bottom community. Dense aggregations of sea whips and brittle stars are abundant in some areas. Sea whip aggregations provide structure and habitat for a number of other invertebrates and fishes. Dungeness crab are residents of the soft bottom shelf environment. The infaunal community in the soft bottom is not well studied but mounds and bioturbated substrate are indications that there is a complex infaunal community. Deposits of undifferentiated mud and sand extend in a plume to the south and a fan to the east of Cordell Bank.

Climate and Oceanography



Satellite image of the temperature of the ocean surface from the spring of 2013. Photo: NOAA

The calendar year at Cordell Bank can be broken into three oceanographic seasons: upwelling season, relaxation season, and winter storm season. The upwelling season typically begins with the spring transition, characterized by strong persistent winds from the northwest. This usually occurs sometime in late February or early March, and is the start of the annual productivity cycle along northern and central California. During this season, upwelling driven by winds from the northwest alternate with periods of calm. These winds generally begin to subside by late July. August through mid-November is the relaxation season. During this time, winds are mostly light and variable, and the seas can be calm for a week or two at a time. This changes abruptly with the arrival of the first winter storms from the Gulf of Alaska. From late November through early February, winter storms create large waves and strong winds along the coast. Ocean conditions can be treacherous all year, but especially during winter storms.

BIOLOGICAL SETTING/ LIVING MARINE RESOURCES

Marine Birds

The waters around Cordell Bank and Bodega Canyon provide critical foraging habitat for many species of seabirds. Seabird densities in this area can be among the highest of any area in central and northern California. Seventy-one seabird species have been identified feeding in or near the sanctuary. The composition of seabirds found is a mix of local breeding birds and highly migratory, open-ocean species. While the local residents use the nearby Farallon Islands and Point Reyes areas to nest, some



Black-footed Albatross feed in the productive waters of CBNMS. Photo: Rich Stallcup

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migrants nest thousands of miles away. A study using radio tags documented that Black-footed Albatross nesting in the northwest Hawaiian Islands were “commuting” to these waters to forage before returning to feed chicks on their nests on Midway Atoll.

Other migratory species use these productive waters as a stopover on their annual migration route. Tens of thousands of Sooty Shearwaters can be seen on days when they are migrating through the sanctuary. Sanctuary waters are equally important to local breeders. Most of the world’s small population of Ashy Storm-petrels, which nest on Southeast Farallon Island, can be seen on the water near the Bank. More than 20,000 Cassin’s Auklets have been counted in a single day.



Gulls, albatross, and many other marine birds inhabit the surface of CBNMS in search of food. Photo: Rich Stallcup

Some common sanctuary species include the Black-footed Albatross, Northern Fulmar, Sooty Shearwater, storm-petrels, Cassin’s Auklet, Rhinoceros Auklet, phalaropes, and many species of gulls.

Marine Mammals

Eighteen species of marine mammals (a combination of resident and migratory species) have been observed within the sanctuary. Gray whales, for example, pass through the sanctuary on their annual migrations between Arctic feeding grounds and Mexican breeding areas.



Dall’s porpoises feed on fish species in CBNMS. Photo: Peter Pyle

Dall’s porpoise is one of the most frequently sighted marine mammals in the sanctuary, along with humpback and blue whales. Individuals of all species use the sanctuary as a



Humpback whales congregate in the waters of CBNMS for the krill found there in abundance. Photo: Tom Kieckhefer

destination feeding ground. Large numbers of the eastern Pacific humpback whales and blue whales feed during the summer months in the CBNMS area.

The harbor porpoise, a species widely distributed in coastal waters but rarely seen offshore, is regularly observed within the sanctuary’s shallow areas. Pacific white-sided dolphins and northern right whale dolphins are abundant. Other cetaceans observed in the sanctuary include Risso’s dolphins and killer whales.

The California sea lion, the most abundant pinniped in California waters, has been observed in CBNMS more frequently and in greater numbers than other pinnipeds. The northern fur seal is also abundant in the area in late fall and winter (most of them use summer breeding grounds in the Channel Islands). Steller sea lions (*Eumetopias jubatus*) decreased drastically in California between 1950-1980s, but the breeding populations at Año Nuevo Island and the Farallon Islands have been stabilizing for the past ten years (Pitcher et al. 2007³); areas around Cordell Bank and other offshore features



California sea lions are the most common pinniped found in CBNMS. Photo: NOAA

remain a feeding area for this species, possibly because of the abundance of rockfish and other fishes. Nearby rookeries include Año Nuevo Islands and the Farallon Islands. The sea lions' winter haul-out grounds include Point Reyes and offshore rocks along the Sonoma County coast.

Fish Resources

There have been 183 species of fish identified in CBNMS. Many species of rockfish (*Sebastes* spp.) can be found at all depths and habitats within the sanctuary. The Bank provides critical habitat for young of the year, juvenile, and adult rockfishes. Lingcod are especially conspicuous in the wintertime, when they move up onto the Bank to spawn. Many species of flatfish use the soft-bottom shelf and slope habitats, and Albacore Tuna and Salmon frequent the sanctuary on a seasonal basis.



*Rockfish (*Sebastes* spp.) occupy many niches in the Bank ecosystem. Photo: Tony Chess*

Benthic Organisms

An abundant cover of benthic organisms can be seen on the upper rock surfaces of Cordell Bank. The constant food supply washing the Bank combined with a hard substrate for attachment



Encrusting life of all colors cover the bank pinnacles. Photo: Cordell Expeditions

provide ideal conditions that support a rich assemblage of benthic invertebrates. The high light penetration allows for algal photosynthesis far deeper than in nearshore coastal waters. These conditions support benthic algae more commonly associated with shallow nearshore habitats. Space is the limiting factor on the upper pinnacles and ridges of Cordell Bank. Ridges are thickly covered with sponges, anemones, hydrocorals, gorgonian corals, hydroids, tunicates, and scattered crabs, holothurians, and gastropods. In some places, the cover is up to one foot

³ Pitcher, K.W., P.F. Olesiuk, R.F. Brown, M.S. Lowry, S.J. Jefferies, J.L. Sease, W.L. Perryman, C.E. Stinchomb, and L.F. Lowry. 2007. Abundance and distribution of the eastern North Pacific Steller sea lion (*Eumetopias jubatus*) population. *Fisheries Bulletin* 107: 102-115.

thick and very brightly colored, mainly in white, pink, yellow, and red. The brilliant reds produced by the fluorescent strawberry anemones are especially striking.

Exposed rock substrate in Bodega Canyon provides habitat for corals, sponges and an assortment of other benthic organisms. Much of the hard substrate investigated was draped with a layer of mud so that invertebrate cover on the canyon edge was sparse (Fruh et al. 2013⁴).

Soft sediment areas of the continental shelf and slope provide habitat for a diverse array of benthic organisms. Some areas on the shelf have dense aggregations of sea whips and brittle stars with sea pens, sea stars, and anemones also present. Dungeness crab are common residents of soft bottom shelf habitat.

At least 618 species of invertebrates and 32 species of algae have been identified in CBNMS.

HUMAN-USE ACTIVITIES

Regional Context

The eastern edge of the sanctuary is located seven miles (six nautical miles) from shore and is separated from the coast of Marin and Sonoma Counties by GFNMS. As an offshore sanctuary, human activities within the sanctuary are limited due to its remote nature. The primary activities include commercial shipping (the northern shipping lane of San Francisco Bay passes through the sanctuary), commercial and recreational fishing, wildlife viewing, research, and education. The coastal areas of west Marin and Sonoma counties are sparsely populated, with ranching, dairy, agriculture, and public open space maintaining a rural character. Most of the people in Marin and Sonoma live about an hour inland from the coast. Bodega Bay is an active fishing port that has the closest marinas to the sanctuary. This harbor also serves as the departure point for charter vessels that provide recreational fishing and wildlife viewing opportunities in the sanctuary.

To the southeast of the sanctuary is the major San Francisco metropolitan area, with a population of about eight million people. The City and County of San Francisco functions as the administrative center of the Bay Area, providing a focal point for many financial, transportation, manufacturing, and government establishments, as well as a source of jobs for area residents.

Commercial Shipping

Vessel traffic entering or leaving San Francisco Bay via the northern traffic lane, which was extended in June 2013, passes through most of the sanctuary within the lane. In 2012, 1,775 commercial vessels reported using the northbound shipping lanes. Of these, 687 were inbound and 1088 were outbound. San Francisco is a staging port for cruise ships traveling north through

⁴ Fruh, E., M.E. Clarke, and C. Whitmire. 2013. A characterization of the deep-sea coral and sponge community in bodega canyon off the coast of California from a survey using an autonomous underwater vehicle. Report to NOAA Deep Sea Coral Research and Technology Program.

CBNMS to Alaska and, to a lesser degree, for cruise ships going south to Monterey or other locations. Cruise ship calls to San Francisco Bay in 2012 included 80 separate visits with 200,000 passengers.

Fishing Activities

The Cordell Bank area has supported an active commercial and recreational fishery.

Commercial and recreational activity is regulated by the Pacific Fishery Management Council (PFMC), working with the National Marine Fisheries Service (NMFS), and the California Department of Fish and Wildlife (CDFW). Commercial fisheries have generally targeted groundfish (includes rockfish, flatfish, Lingcod, Black Cod, Pacific Whiting and other species) Salmon, crab and Albacore Tuna. Recreational fisheries have generally focused on rockfish, Lingcod, Salmon, and Albacore Tuna and crab. Most of the private boats and charter vessels that fish in the sanctuary are from Bodega Bay. Recreational fishing is strongly influenced by the weather. Strong winds and rough ocean conditions often prevent smaller boats from venturing out to the



Commercial and recreational fishing target rockfish, Salmon, and pelagic species. Photo: NOAA

sanctuary.

Wildlife Viewing

Wildlife viewing is an increasingly popular activity in the sanctuary. The birding community has traveled to Cordell Bank and Bodega Canyon for many years to observe species of open ocean seabirds. More species of albatross have been seen in this region than anywhere else in the northern hemisphere.

Because of the abundance of food, this area is a destination feeding ground for leatherback sea turtles, seabirds, humpback and blue whales. Beginning in early summer and continuing through fall, feeding turtles, seabirds, humpback and blue whales frequent sanctuary waters. This coincides with the calmest weather of the year, and many charter vessels from Bodega Bay and San Francisco make regular whale-watching trips to the sanctuary at this time.



Wildlife viewing is the best way for people to experience the rich environment of Cordell Bank. Photo: NOAA

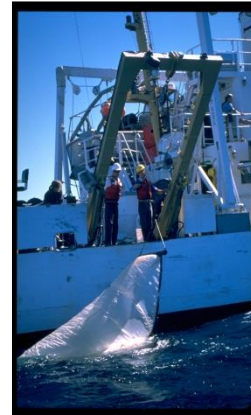
Education

One of the CBNMS goals is to promote appreciation, public awareness, and understanding for the marine resources. The CBNMS education program sponsors a yearly lecture series; participates in many outreach events; hosts a monthly radio show; delivers programs at local schools; and trains teachers to educate about the sanctuary and the ecosystem it protects. Other

opportunities for the public to learn about the sanctuary include: museum exhibits, interpretive displays, brochures, websites, and field ecology outings.

Research

The first research effort in this area occurred in 1869 when Edward Cordell mapped the Bank. Early research was confined to geographic surveys and rock sampling. In the 1970s and 80s, Cordell Expeditions, a non-profit organization, initiated a process of exploration to describe the Bank. Today, the majority of research and monitoring in the sanctuary is conducted by CBNMS or in partnership with universities, other state and federal agencies and non-profit organizations. Every year, the National Marine Fisheries Service assesses juvenile rockfish recruitment and regularly conducts population surveys for adult fishes. CBNMS has been monitoring ocean conditions since 1997. These programs have included the investigation of oceanographic conditions and how they relate to the distribution and abundance of krill, seabirds, and whales. From 2001 to 2005, CBNMS staff and partners characterized benthic habitats on Cordell Bank and monitored fishes and invertebrates on and around the Bank. In 2010 and 2011, CBNMS worked with partners using remotely operated vehicles and autonomous underwater vehicles to characterize habitats and deep coral/sponge communities on the continental slope and in and around Bodega Canyon.



Research in CBNMS answers important questions about the ecosystem the sanctuary

JURISDICTIONAL SETTING

Although the CBNMS staff does coordinate with state agencies such as CDFW and the California Coastal Commission, CBNMS lies entirely in federal waters. Federal jurisdictional partners include:

United States Coast Guard (USCG) holds broad responsibility for enforcing all federal laws throughout the sanctuary and assists NOAA in the enforcement of sanctuary regulations, among other duties. USCG provides on-scene coordination with Regional Response Center facilities under the National Contingency Plan for removal of oil and hazardous substances in the event of a spill that threatens sanctuary resources.

NMFS has responsibility along with the CDFW, under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), for approving, implementing and enforcing Fishery Management Plans prepared by regional fishery management councils to ensure sustainability of fishery resources. NMFS also shares responsibility with the United States Fish and Wildlife Service (USFWS) for the implementation of the MMPA and the ESA to prevent takings of any species protected under these laws. In addition, NOAA's Office of Law Enforcement (OLE) has responsibility for enforcing the NMSA.

United States Environmental Protection Agency (USEPA) has regulatory responsibilities with regard to sewage outfalls (under the Clean Water Act) via National Pollutant Discharge Elimination System (NPDES) Permits, and ocean dumping (under Title I of the Marine Protection, Research, and Sanctuaries Act) to protect water quality.

USFWS is responsible for protecting all marine mammal species other than whales, porpoises, and pinnipeds under the MMPA and for protecting endangered or threatened bird and other species under the ESA.



**SITE-SPECIFIC
ACTION PLANS
CBNMS DRAFT MANAGEMENT PLAN**

- I. Structure of Action Plans**
- II. Education and Outreach**
- III. Resource Protection**
- IV. Partnerships with Community Groups**
- V. Conservation Science**
- VI. Administration**

STRUCTURE OF ACTION PLANS

This management plan includes a set of functionally based action plans that outline how the sanctuary will be managed for the next five to ten years. Each action plan outlines how different strategies will be conducted and proposes performance indicators as a measure of management effectiveness.

DEVELOPMENT OF ACTION PLANS

Through the management plan review and scoping for the proposed expansion, resource management issues to be addressed in the management plan were identified. The following issues and program areas are addressed in this management plan:

- A. Education and Outreach
- B. Resource Protection
- C. Partnerships with Community Groups
- D. Conservation Science
- E. Administration

OUTLINE OF ACTION PLANS

Each action plan is divided into seven sections, which are described in detail below.

Issue Statement/Program Statement

The issue (or program) statement provides an introduction about “why” this is a priority issue to be addressed by sanctuary management in the management plan. It may include a brief description of the current situation or problem, and specific areas, which need attention.

Issue Description/Program Description

The issue (or program) description provides a general background on what the CBNMS staff currently knows or understands about an issue. Program descriptions explicitly describe the types of activities already undertaken by the CBNMS staff and the general direction it would like to move in the future. It includes the status of natural resources, related human-use activities occurring in the sanctuary, and jurisdictional authorities pertinent to the specific issue.

Goals

The goal states the desired future state of the CBNMS ecosystem and management actions relevant to the specific resource management issue or program area. The goal is a broad statement about a long-term desired outcome that may or may not be completely obtainable.

Structure of Action Plans
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Objectives

The objectives are measurable outcomes for evaluating progress and success in moving toward the future desired condition.

Strategies

This section describes how the objectives will be accomplished for the particular issue or program area. Each strategy addresses one or more objectives and is divided into specific activities for the CBNMS staff to carry out. Activities are developed and implemented to achieve the goals and objectives of the issue or program area.

Many activities within this plan complement each other by providing the groundwork for other activities to take place or by being similar such that efficiencies can be achieved by working on them together.

Performance Measures

Each action plan includes a chart presenting the outcomes expected and the performance indicators that will be used to measure progress toward the outcome. This effort is being undertaken to measure CBNMS management effectiveness (i.e. the achievement of a planned effort or activity). The methodology to be used to assess the effectiveness of each strategy in achieving the desired goal is detailed in this chart. The definitions for the performance measure terminology follow.

<i>Strategy</i>	The management action taken by the CBNMS staff to address a particular issue.
<i>Performance Goal</i>	The overarching, very broad target for the action plan. The goal(s) under each issue area or program area action plan.
<i>Desired Outcome (Objective)</i>	The more specific outcomes we want to achieve with our activities within the scope of the performance goal. The objectives under each issue area or program area action plan.
<i>Outcome Measure</i>	A specific amount or degree of the indicator that shows progress towards the desired outcome. Could contain temporal (by year) and range targets (percent, fraction, etc.).
<i>How Measured</i>	Describes exactly how the outcome measure will be measured.
<i>Who Measures</i>	The staff or outside partner who will measure the outcome.
<i>Output Measure</i>	A specific product or tool that results from the activity. Its production demonstrates a completed objective.

Key Partners

Key partners are organizations that the sanctuary managers believe have common interests with CBNMS on a particular activity. This list does not limit the partners CBNMS may work with,

but merely serves as a guide when implementing the activity. The sanctuary staff may partner with other organizations as work on a particular activity or strategy progresses. Likewise, the products listed are projected, but additional or altered products may become more appropriate as the strategy is completed.

IMPLEMENTATION OF THE MANAGEMENT PLAN

This plan is designed to guide management of the marine resources of CBNMS for the next five to ten years. Implementation of this new management plan will require cooperation and coordination among many federal, state, and local government agencies, as well as private organizations and individuals. Information exchange, sharing facilities and staff, and the coordination of policies and procedures within an ecosystem context are features of this management plan and each of its program areas.

Limitations

Although this management plan for CBNMS details the action plans for the three program areas, an action plan for community outreach, and an action plan for administration, how the strategies within the action plans are implemented may be affected by multiple factors. These factors include: (1) funding that comes primarily from congressional appropriations that may fluctuate from year to year; (2) CBNMS's ability to forge new partnerships in which staff, facilities and financial resources may be shared; (3) CBNMS's need to be responsive to the ever changing impacts on the sanctuary's marine resources from both natural perturbations and human activities; (4) an increased understanding of the complexity of the ecosystem, habitats, and living marine resources; and (5) learning better ways to manage the resources through experience, experimentation, and the sharing of knowledge. Sanctuary staff, the advisory council, the public, and CBNMS's partners will, as appropriate, provide oversight and guidance for redirecting any management plan strategies.

Implementation of CBNMS Action Plans

Each of CBNMS's program areas—Education and Outreach; Conservation Science; and Resource Protection—has an associated action plan for implementing the management plan. These action plans are designed to directly address resource management issues and guide management of CBNMS over the next five to ten years. The level of implementation of an action plan and its components will be based upon the funding or resources available each fiscal year. As stated previously, full implementation of the management plan exceeds the resources available to CBNMS, therefore requiring some prioritization of the action plan or strategies. As resources become available, a greater level of implementation is possible. Implementation of most of the strategies in this management plan requires some input or coordination from partners, particularly other government agencies, research institutions and non-governmental organizations (NGOs). Many action plans and strategies are completely dependent on involvement from other agencies or dependent on research conducted by a research institution.

Implementation of the management plan will require: coordination within and between action plans; sharing of staff and financial resources between program areas; and cooperation and

Structure of Action Plans
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coordination among many federal, state, and local government agencies, as well as private organizations, institutions, and individuals.

Operating funds for CBNMS management come from federal appropriations to the ONMS. These funds cover expenses such as personnel salaries, programs, vessel maintenance, property rental, equipment, and supplies.

Unpredictable and variable funding for staff and program development may affect specific aspects of the management plan. The scale and scope of certain programs may be modified due to any unforeseeable changes in the level of funding, however the goals and objectives of the plan will remain unchanged.

Funding for implementation of many of the strategies will require a mix of internal ONMS funds as well as funding from external sources such as grants or in-kind work from partner agencies. Table 1 depicts the implementation of the CBNMS Management Plan by Action Plan and strategy, and shows several funding scenarios.

Table 1: Implementation of CBNMS Management Plan

Table Legend						
Strategy Status:	Implementation Ranking:	Necessary Partnership Coordination:			Primary Funding Sources:	
● – Existing w/o significant modification	H – High	● – Not possible w/o partners			● – External (e.g., grants)	
◐ – Existing w/significant modification	M – Medium	◐ – Significant reliance on partners			◐ – Internal/External	
○ – New or future (not yet implemented).	L – Low	○ – Little reliance on partners			● – Internal (increased budget)	
					○ – Internal (base budget)	
Action Plans	Strategy Status	Level Funding Scenario 1	Moderate Increase Scenario 2	Substantial Increase Scenario 3	Partnership Coordination	Internal/External Funding Sources
Education and Outreach						
ED-1 General Outreach	●	H	H	H	●	◐
ED-2 Sanctuary Naturalist Program	○	L	M	H	◐	◐
ED-3 Media and Communications	●	H	H	H	◐	○
ED-4 Educational Tools to Promote Ocean Literacy	●	H	H	H	○	◐
ED-5 Interpretive Signage	●	H	H	H	◐	●
ED-6 Integrate Conservation Science into Education	●	H	H	H	○	○
ED-7 Adult Education	◐	M	H	H	●	◐
ED-8 Education Working Group	○	L	M	H	●	●
ED-9 Multicultural Programming	○	L	M	H	●	◐

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Table 1: Implementation of CBNMS Management Plan

Action Plans	Strategy Status	Level Funding Scenario 1	Moderate Increase Scenario 2	Substantial Increase Scenario 3	Partnership Coordination	Internal/External Funding Sources
Resource Protection						
RP-1 Track Human Use Activities	●	H	H	H	○	○
RP-2 Address Ship Strikes of Whales	◐	H	H	H	●	◐
RP-3 Profile Fishing Activities in Sanctuary	◐	M	M	M	◐	○
RP-4 Assess Acoustic Impacts	◐	L	M	H	●	◐
RP-5 Assess and Remove Marine Debris	◐	L	M	H	◐	◐
RP-6 Enforcement Plan	●	H	H	H	●	◐
RP-7: Emergency Response	●	H	H	H	●	○
RP-8 Regulations and Permitting	●	H	H	H	○	○
Partnerships with Community Groups						
PC-1 Research Community Partnerships	●	H	H	H	●	◐
PC-2 Develop Sanctuary Advisory Council Links to Community	●	H	H	H	●	○
PC-3 Media Partnerships	◐	M	M	H	●	○
PC-4 Fiscal Partnerships	◐	H	H	H	●	◐
Conservation Science						
CS-1 Oceanographic Climatology Report	○	L	M	H	●	◐
CS-2 Habitat Characterization	●	M	H	H	◐	◐
CS-3 Characterize Soft-Bottom Epifaunal Communities	●	L	M	H	◐	◐
CS-4 Characterize Soft-Bottom Infaunal Communities	○	L	M	M	◐	◐
CS-5 Voucher Specimen Collection	●	L	M	H	●	○
CS-6 Survey Museum Collections	●	L	M	M	●	○

Table 1: Implementation of CBNMS Management Plan

Action Plans	Strategy Status	Level Funding Scenario 1	Moderate Increase Scenario 2	Substantial Increase Scenario 3	Partnership Coordination	Internal/External Funding Sources
CS-7 Pelagic Monitoring	●	H	H	H	◐	◐
CS-8 Fish and Invertebrate Monitoring	●	H	H	H	◐	◐
CS-9 Data Management	◐	H	H	H	○	○
CS-10 Supply/Receipt of Larval Fishes	○	L	M	M	●	◐
CS-11 Proposed Research Activities	◐	L	M	H	●	◐
Administration						
AD-1 Operations	◐	M	M	H	○	◐
AD-2 Staffing	◐	L	M	H	○	○
AD-3 Partnerships	●	M	H	H	●	◐
AD-4 Support Sanctuary Advisory Council	●	H	H	H	●	○
AD-5 Interagency Coordination	●	M	H	H	●	◐
AD-6 Performance Evaluation Strategy	◐	H	H	H	○	○



EDUCATION AND OUTREACH ACTION PLAN

PROGRAM STATEMENT

CBNMS has developed a long-term education and outreach action plan that builds a greater understanding of the sanctuary ecosystem. This action plan seeks to emphasize the ocean's influence on people and people's influence on the ocean using the sanctuary and the greater California Current ecosystem as a focus. CBNMS will work to increase ocean literacy and awareness of the national marine sanctuaries to encourage ocean stewardship.

PROGRAM DESCRIPTION

This action plan addresses the need to cultivate an informed, involved constituency who cares about protecting, conserving, and restoring our precious ocean resources and national marine sanctuaries. It aligns with NOAA's identified need to build a more informed and involved ocean literate public. In addition, the U.S. Commission on Ocean Policy's Final Report-An Ocean Blueprint for the 21st Century, stresses the need to increase the nation's ocean awareness and to improve ocean related education efforts as *"critical to building an ocean stewardship ethic, strengthening the nation's science literacy, and creating a new generation of ocean leaders."* The report concluded an interested, engaged public is an essential prerequisite *"to successfully address complex ocean and coastal-related issues, balance the use of conservation of marine resources, and realize future benefits from the ocean."*

A national survey by the Ocean Project (1999) indicates the American public has a superficial awareness of the importance of the ocean on their daily lives, let alone its importance to all life on the planet. The *Ocean Blueprint* goes on to state, *"The ocean is a source of food and medicine, controls global climate, provides energy, supplies jobs, supports economies, and reveals information about the planet not gained from any other source. While most people do not recognize the number of benefits the ocean provides, or its potential for further discovery, many do feel a positive connection with it, sensing perhaps the vitality of the sea is directly related to human survival."*

In an effort to increase awareness, the ONMS has partnered with the National Geographic Society (NGS), the Centers for Ocean Sciences Education Excellence (COSEE) and the College of Exploration to identify the critical elements of ocean literacy in the context of science. Ocean literacy is defined as *"an understanding of the ocean's influence on you – and your influence on the ocean."* An ocean-literate person understands:

- *the essential principles and fundamental concepts of ocean science (listed below),*
- *can communicate about the oceans in a meaningful way,*
- *can make informed and responsible decisions regarding the oceans and its resources.*

Seven Essential Principles of Ocean Literacy:

1. The Earth has one big ocean with many features.
2. The ocean and life in the ocean shape the features of the earth.
3. The ocean is a major influence on weather and climate.
4. The ocean makes the Earth habitable.
5. The ocean supports a great diversity of life and ecosystems.
6. The ocean and humans are inextricably linked.
7. The ocean is largely unexplored.

Education programs listed in this plan are designed to enhance public awareness and understanding of the sanctuary in the context of its larger ecosystem—the ocean, and how people are connected to it, and to build stewards to take on the responsibility of protecting it. The development of effective and coordinated education programs is a priority for all national marine sanctuaries.

CBNMS will use education and outreach as a resource management tool to address specific priority resource management issues that are identified in the management plan and will coordinate with other program areas such as conservation science and resource protection to disseminate key information. Developing partnerships with other agencies, institutions, and organizations is the key to success in building effective, well-coordinated education strategies. CBNMS and GFNMS will collaborate to serve common audiences.

Awareness raising activities cut both ways in generating greater support for sanctuary protection, as well as greater demand to access sanctuaries. The harsh conditions and remoteness of CBNMS has kept it from the public eye “out of sight, out of mind” and barring historical fishing activities, it has been relatively untouched to date. But as more people learn about the beauty and awe of CBNMS, many will want to go there and experience it either through diving or surface wildlife viewing trips. The sanctuary staff must therefore consistently underscore the message that in order to preserve the fragile balance of this special place, people must love it respectfully. Education and outreach activities therefore will mostly focus on “bringing the place to the people.”

EDUCATION AND OUTREACH GOALS

1. Use education as a management tool to protect the sanctuary’s resources.
2. Build an education program that complements and promotes other CBNMS programs such as conservation science and resource protection.
3. Create an ocean literate public that is informed and involved.

EDUCATION AND OUTREACH OBJECTIVES

1. Take a hierarchical educational approach by developing awareness and building a knowledge base to change behavior and build stewardship.
2. Increase communication and coordination among CBNMS education and outreach programs and partners.
3. Develop programs to target students, teachers, content builders, user/impact groups, influencers, decision makers, and citizens in Sonoma, Marin, and Mendocino watersheds.
4. Develop programs that target diverse audiences including various multicultural, socioeconomic, age and gender groups.

EDUCATION AND OUTREACH STRATEGIES

STRATEGY ED-1: *Develop community support and partnerships for ocean conservation through targeted outreach efforts.*

Activity 1.1 In coordination with GFNMS and MBNMS, build community partnerships by engaging and informing the public about CBNMS, neighboring sanctuaries, and the greater California Current Ecosystem.

- A. Develop tailored outreach messages for specific users and audiences and implement in CBNMS communication plan.
- B. Develop joint outreach materials for CBNMS, GFNMS and MBNMS, including products, lectures, and programs based on established priorities that address ocean literacy, and inspire stewardship by supporting and acknowledging behaviors that protect ocean resources.
- C. Work with the Sanctuary Advisory Council, scientists, users, and regulatory agencies on identifying appropriate messages for reaching out to constituents.
- D. Identify and target outreach/education strategies that are relevant to reach culturally diverse and underserved communities.

STRATEGY ED-2: *Utilize volunteers and interns to assist sanctuary staff in communicating sanctuary messages to a broader audience and carrying out program needs.*

Activity 2.1 Develop a broad-based umbrella program to train volunteers and interns to deliver ocean and sanctuary messages in a variety of settings and venues.

- A. Create a framework and plan for supporting or collaborating with a long term volunteer Sanctuary Naturalist Program that trains volunteers and interns to: deliver outreach and educational messages; and deliver interpretive programs to schools, community groups, and at public events.
- B. Explore potential partnership with organizations to collaborate or develop volunteer programs to facilitate learning opportunities with volunteers and docents about ocean stewardship.
- C. Develop training program and materials for volunteers and interns and provide ongoing learning opportunities for volunteer and interns including opportunities at sea.
- D. Evaluate volunteer/intern satisfaction and effectiveness of outreach program and add new training and volunteering opportunities as appropriate.
- E. Explore long term education/outreach formal intern opportunities.

Activity 2.2 Train volunteers and employees of existing interpretative and volunteer organizations/agencies to deliver and incorporate CBNMS messages through their programs.

- A. Identify and survey potential organizations for needs and willingness to partner with CBNMS to distribute sanctuary and ocean conservation messaging.
- B. Develop general training presentation on CBNMS to reach a variety of education and interpretation audiences and continually update with current issues, topics of interest, and more effective media such as videos and animations.
- C. Create and distribute outreach materials about CBNMS.
- D. Maintain regular communication with partners and provide materials to staff and volunteers as needed.

STRATEGY ED-3: *In coordination with other California national marine sanctuaries, leverage local, regional, and national media opportunities to increase Californians' ocean awareness.*

Activity 3.1 Communicate with the media. Components of the site's media plan will be developed in coordination and cooperation with other California national marine sanctuaries.

- A. Complete CBNMS media and communications plan and review site plan annually as needed. Incorporate ONMS Communication Playbook tools as appropriate.
- B. Define staff's roles and advisory council's roles in working with the media and have all staff and advisory council members and alternates participate in media training.

- C. Develop an annual media plan for upcoming events, including identifying and creating media opportunities, roles, and timelines.
- D. Continue a regular CBNMS spot on local radio station (KWMR). Continue posting podcast of show on CBNMS website.
- E. Develop and maintain relationships with local media.
- F. Develop and distribute press kits at events as appropriate.
- G. Participate in NOAA's Ocean Communicators network (Thank You Ocean campaign). Apply campaign tools to media work at the site.

STRATEGY ED-4: *Promote ocean literacy and stewardship to far-reaching audiences through the development of education and outreach tools.*

Activity 4.1 Develop portable products as outreach tools to educate a broader audience about the resources and activities of CBNMS and ocean conservation.

- A. Identify audience, purpose, need and justification to design portable products such as, but not limited to multimedia audio/visual products, internet based, hands on activities, teaching aids, exhibits, displays, photo database accessible to the public.
- B. Identify audience, purpose, and need to plan and design printed materials about CBNMS, such as posters, brochures, and one-pagers. Evaluate those in existence and use results in future publications.
- C. Maintain an active, dynamic, and robust website that is continually reflecting changing programs and activities at Cordell Bank NMS and design standards.
- D. Incorporate NOAA approved social media outlets into outreach and communication strategies (e.g., Facebook).

Activity 4.2 Expand CBNMS's reach into K-12 school audiences by creating standards-based curricular activity sets that complement existing curriculum and provide targeted professional development opportunities for teachers.

- A. Identify ocean themes relevant to people's everyday lives.
- B. Identify Ocean Literacy themes, and how these topics apply to National/State based standards.
- C. Develop a finite number of standards-based activities in one or two different age groups (i.e. 4-6th, 7-8th, 9-12 grades).

- D. Engage partners and assemble an advisory group to review and provide feedback on activity sets.
- E. Present activities at science and environmental education related conferences to engage users.
- F. Lead activities at partners' teacher trainings around northern California.
- G. Develop in class program to be delivered in classrooms by interns/volunteers.

STRATEGY ED-5: *In coordination with West Coast Region, increase awareness of CBNMS through interpretive signage and exhibits throughout the region.*

Activity 5.1 Install interpretive signage at key field locations; place exhibits in museums and visitor centers throughout Marin and Sonoma counties and in visitor centers in other counties that include a regional north-central coast focus. Coordinate and collaborate with West Coast Region on presentation and messaging.

- A. Choose sign/exhibit locations based on diversity of visitors, both geographically, culturally, and relevance to messages.
- B. Establish and coordinate partnerships with staff at key locations where signage and exhibits are identified as high priority to message to visitors.
- C. Secure funding, and create culturally and geographically relevant messages, content and designs.
- D. Construct and install signs and exhibits, beginning with highest priority locations as outlined in the regional Long Range Interpretive Plan.
- E. Complete priorities and implement facilities plan for visitor centers as outlined in the regional Long Range Interpretive Plan.
- F. Continue to work closely with the Oakland Museum of California to update Cordell Bank exhibit and content as necessary.

STRATEGY ED-6: *Increase awareness and knowledge of CBNMS Conservation Science and Resource Protection programs by creating opportunities, programs, and materials for teachers and students.*

Activity 6.1 Link CBNMS research programs with teachers and students by exploring ways to integrate conservation science projects into the classroom.

- A. Collaborate with NOAA Teacher at Sea program to place a teacher on CBNMS research/monitoring cruises. *Note: due to variability of weather and ship time, and projects, this program may vary from year to year.*

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- B. Collaborate with scientists conducting research in the sanctuary to interpret their findings so results can be understood by broader audiences including students, teachers and media.
- C. Work with participants from teacher at sea programs to develop activities and curriculum associated with field experiences in the sanctuary.

Activity 6.2 Encourage development of marine technology skills and careers in marine education. One of NOAA’s goals is to provide skills to the future workforce to become the next leaders in ocean exploration and protection. The CBNMS staff will engage students and teachers in the understanding of marine technology by creating programs that encourage development of marine engineering skills, remote sensing, mapping skills, monitoring skills, and others.

- A. Explore partnerships to further sanctuary awareness through education programs that teach marine technology.
- B. Create materials that are relevant to the Next Generation Science Standards for teachers that utilize marine technology skills and information.
- C. Explore use of GIS technology and partnerships to utilize sanctuary related data sets for curriculum.
- D. Implement marine technology workshops at sanctuary sites to integrate marine technology activities into high school and/or college curriculum.

STRATEGY ED-7: Increase awareness, knowledge, and appreciation of CBNMS through adult education programming.

Activity 7.1 Offer in-depth learning and field opportunities that explore the natural history of CBNMS, ocean conservation issues and the California Current Ecosystem.

- A. Facilitate on the water excursions to CBNMS and surrounding waters with partners.
- B. Create adult education course through community education programs or community colleges in Marin and Sonoma, and create syllabus/curriculum to include a broad overview of topics relating to the sanctuary and broad surrounding ecosystem.
- C. Develop educator focused coastal ecology workshop series to help teachers gain knowledge and experience with the coastal environment, California Current ecosystem and sanctuaries.

STRATEGY ED-8: *Support the Sanctuary Advisory Council in creating an Education Working Group for specific projects or issues.*

Activity 8.1 Support the Sanctuary Advisory Council in creating a working group of education experts from local schools, school districts, county offices of education, educational institutions and, if appropriate, users and other agencies that can inform the Sanctuary Advisory Council on the development and implementation of specific education related projects or management issues.

- A. Provide recommendations and guidance on CBNMS outreach and education programs, or on issues where education can address a CBNMS management issue.
- B. Explore collaborations to create innovative education and outreach programs and reduce potential duplication of efforts.

STRATEGY ED-9: *Develop a multicultural education plan targeting changing demographics in the CBNMS region of northern California.*

Activity 9.1 Identify communities and populations with growing non-English speaking populations. (*North of San Francisco, the Hispanic population is the dominant non-English speaking population.*)

- A. Assess demographic data from counties of Marin, and Sonoma and southern Mendocino counties
- B. Seek partnerships with other agencies, organizations looking to reach underserved audiences in environmental/ocean literacy related content
- C. Collaborate with West Coast Region sites implementing multi-cultural programming at their sites (e.g., MERITO program at MBNMS and CINMS)
- D. Create plan for CBNMS to implement culturally relevant programming for non-English speaking populations, including secure funding scheme and partners' roles.

CBNMS Education and Outreach

Performance Measures

Strategy Title(s)	Performance Goal	Desired Outcome (Objective)	Outcome Measure	How Measured	Who Measures	Output Measure
<p>Strategy ED-1: Develop community support and partnerships for ocean conservation through targeted outreach efforts.</p> <p>Strategy ED-2: Utilize volunteers and interns to assist sanctuary staff in communicating sanctuary messages to a broader audience and carrying out program needs.</p>	Continually reach broader audiences to create an informed and involved public.	Take a hierarchical educational approach by: developing awareness, building a knowledge base, changing behavior and building stewardship.	Increase in support from the community for CBNMS programs.	<p>1) Completion of the Sanctuary Naturalist Corps training program (short-term).</p> <p>2) Increase in the number of outreach opportunities undertaken by the sanctuary staff as a direct result of a well-established and coordinated volunteer program (long-term).</p> <p>3) Increase in number of volunteers (long-term).</p> <p>4) Increase in retention of volunteers (long-term).</p>	Education Specialist, Volunteer Coordinator (GFNMS), and Sanctuary Superintendent	<p>1) Regularly scheduled volunteer training and follow-up/refreshers program.</p> <p>2) Sanctuary Naturalist training manual.</p>
<p>Strategy ED-3: Leverage local, regional, and national media opportunities.</p> <p>Strategy ED-4: Develop education and outreach tools to promote ocean literacy.</p> <p>Strategy ED-5: Increase awareness through interpretive signage and exhibits.</p>	Continually reach broader audiences to create an informed and involved public.	Develop programs to target students, teachers, content builders, user/impact groups, influencers, decision makers, and citizens in Sonoma, Marin, and Mendocino watersheds.	<p>1) Expand messaging tools and venues to continually reach a broader audience.</p> <p>2) Increase attendance in CBNMS programs.</p>	<p>1) Track media coverage to determine increases in exposure.</p> <p>2) Track increase in sanctuary awareness at museums etc. that have sanctuary exhibits.</p>	Education Specialist and Sanctuary Superintendent	<p>1) Increase in number of press releases and radio spots.</p> <p>2) Complete development of outreach tools.</p> <p>3) Complete design, fabrication and installation of signage and displays at new locations.</p>

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Strategy Title(s)	Performance Goal	Desired Outcome (Objective)	Outcome Measure	How Measured	Who Measures	Output Measure
<p>Strategy 6: Increase awareness and knowledge of CBNMS conservation science and resource protection programs by creating opportunities, programs, and materials for teachers and students.</p> <p>Strategy ED-7: Increase awareness and knowledge through adult education opportunities.</p> <p>Strategy ED 8: Support an Education Working Group of the Sanctuary Advisory Council for specific projects or issues.</p>	<p>1) Continually reach broader audiences to create an informed and involved public.</p> <p>2) Use education to complement and promote other CBNMS programs such as research, monitoring, and enforcement.</p> <p>3) incorporate users input into development of new programs and materials.</p>	<p>Take a hierarchical educational approach by: developing awareness, building a knowledge base, changing behavior, and building stewardship.</p>	<p>1) Increase in awareness of CBNMS ecosystem and programs.</p> <p>2) Increase involvement in education programs in the sanctuary by students and teachers, and adults.</p>	<p>1) Track increase of teachers, students and adults participating in CBNMS programs.</p> <p>2) Track increase in use of CBNMS ecosystem topics integrated into school curricula.</p>	<p>Education Specialist and Sanctuary Superintendent</p>	<p>1) Classroom curriculum</p> <p>2) Products for teacher</p> <p>3) Website content</p>
<p>Strategy ED 9: Develop multicultural plan that is targeted to the changing demographics in the CBNMS region of northern California.</p>	<p>1) Continually reach broader audiences to create an informed and involved public.</p> <p>2) Develop targeted strategies to reach diverse audiences.</p>	<p>Take a hierarchical educational approach by: developing awareness, building a knowledge base, changing behavior, and building stewardship.</p>	<p>1) Increase in awareness of watershed and ocean environment.</p> <p>2) Increase in participation of CBNMS education programs by culturally diverse communities.</p>	<p>1) Create plan that involved regional partners to target culturally diverse communities.</p>	<p>Education Specialist and Sanctuary Superintendent</p>	<p>1) Multicultural education plan created</p> <p>2) Multicultural education working group assembled to advise on plan</p>

KEY PARTNERS

GFNMS, MBNMS, ONMS West Coast Regional Office (WCRO), advisory council for CBNMS, advisory council for GFNMS, Point Reyes National Seashore (PRNS), Golden Gate National Recreation Area (GGNRA), California Coastal Monument, California State Parks, San Francisco Bay National Estuarine Research Reserve (SFBNERR), Sonoma County Regional Parks, Spud Point Marina, U.C. Davis - Bodega Marine Laboratory (BML), Sonoma State University, other local universities, Santa Rosa Community College, College of Marin, Monterey Peninsula College, local schools, Tam Union High School District Adult and Community Education, Offices of Education in the Bay Area, Bay Watershed Education and Training (BWET) program/Ocean Guardian Grant recipients, Multicultural Education for Resource Issues Threatening Oceans (MERITO) Program, Marine Advanced Technology Education (MATE) Center, Center for Image Processing and Education (CIPE), California ocean communicators alliance (Thank You Ocean), libraries, Porto Bodega, NGS, KWMR: Community Radio for West Marin, The Sea Ranch Association, National Marine Sanctuary Foundation (NMSF), Cordell Marine Sanctuary Foundation (CMSF), Farallones Marine Sanctuary Association (FMSA), Point Reyes National Seashore Association (PRNSA), Oakland Museum of California, California Academy of Sciences, Stewards of Coast and Redwoods, The Marine Mammal Center (TMMC), Fort Ross Conservancy, Oikonos Ecosystem Knowledge, various watershed councils, Environmental Forum of Marin, Point Blue Conservation Science (PBCS), Pacific Coast Science and Learning Center, various non-profits in Bay Area doing environmental education and science education, and NGOs that work with multicultural populations.



RESOURCE PROTECTION ACTION PLAN

ISSUE STATEMENT

Specific impacts from various activities on CBNMS natural resources are complex and difficult to document and manage. Some of the issues include: (1) emergency preparedness and emergency response limitations; (2) vessel traffic and ship strikes on whales; (3) acoustic impacts of anthropogenic noise in the ocean; (4) impacts on benthic habitats from fishing gear; and (5) impacts from marine debris.

ISSUE DESCRIPTION

CBNMS is located in one of the world's four major upwelling systems. The upwelling of nutrient-rich, deep ocean water provides a food-rich environment and promotes the growth of organisms at all levels of the marine food web. The vertical relief and hard substrate of Cordell Bank provides habitat with nearshore characteristics in an open ocean environment about 23 miles (20 nautical miles) from shore. The tremendous biodiversity found in the sanctuary includes fishes, marine mammals, seabirds, sea turtles, algae, and benthic and pelagic invertebrates.

The northern traffic lane passes through CBNMS and provides entry and egress for commercial vessels calling on ports in San Francisco Bay. In summer and fall, this same area is a feeding area for endangered blue, fin and humpback whales. In years when large concentrations of whales are feeding in the sanctuary, ships using the traffic lane have inadvertently struck and killed whales. The sanctuary staff continues to coordinate with the USCG, NMFS, industry and other partners to better understand this issue and will work with partners to reduce the risk of ships striking whales.

Noise levels in the marine environment have been rising due to anthropogenic sources such as increased shipping traffic, sonar technologies, and research projects. The effects of noise on marine mammals, seabirds, fishes, and turtles is not entirely known, though it is thought to negatively affect various life functions such as finding prey, navigating, mating, and evading predators. For example, active sonar has been conclusively linked to the deaths of whales in some areas. In addition, an increase in low frequency sounds from shipping traffic has been shown to significantly alter ambient noise in various parts of the world's oceans. Issues of concern in CBNMS include the effects of acoustics on marine mammals by ships, the military, research, or other influences. NOAA and its partners have conducted and continue to conduct

research regarding the effects of sound disturbance on marine mammals; however additional CBNMS-specific research and monitoring may be necessary.

Commercial and recreational fisheries in CBNMS have historically targeted rockfish, Lingcod, flatfish, salmon, Albacore Tuna, and crab. Most of the private boats and charter vessels that fish CBNMS are from Bodega Bay, although rough ocean conditions often prevent smaller recreational boats from accessing CBNMS. Gear types used in CBNMS over the years have included bottom trawl, mid-water trawl, hook and line, gill nets, crab traps, and long lines (including troll long line, vertical long line, and fixed gear long line). Management of commercial and recreational fisheries in California is the responsibility of NMFS the PFMC, and CDFW. CBNMS is entirely in federal waters.

Debris in the ocean and along the shore is a growing concern. Various types of debris are known to have adverse effects on marine species. Plastics in the marine environment never fully degrade and recent studies show plastic is consumed by organisms at all levels of the marine food web. Dichlorodiphenyltrichloroethane (DDT) and other hydrophobic compounds are known to adhere to plastics. Ingestion and entanglement are some of the many problems associated with marine debris, which may eventually lead to death for many organisms. The types of marine debris causing the most concern include balloons, abandoned/discarded fishing gear, Styrofoam, and consumer goods including 6-pack rings, plastic shopping bags, and other plastics.

Significant amounts of derelict fishing gear have been documented in CBNMS. This includes long lines, gill nets, crab gear, trawls and trawl warps entangled on and around the Bank. CBNMS research has demonstrated that the Bank's physical structure and benthic invertebrate community provides critical habitat for recovering stocks of west coast rockfish (*Sebastes* spp.). The PFMC identified Cordell Bank as a Habitat Area of Particular Concern under their Essential Fish Habitat designation. One concern is that the abandoned fishing gear on Cordell Bank may be negatively impacting sanctuary resources, creating artificial habitat for marine life, and potentially impacting the physical structure of the Bank. This derelict gear also poses a danger to personnel and equipment involved in CBNMS research and monitoring activities.

JURISDICTIONAL SETTING

Restricted Access Fisheries

Management of commercial and recreational fisheries in California is the responsibility of CDFW, NMFS and the PFMC. Restricted access programs in fisheries limit the quantity of persons, vessels, or fishing gear that may be engaged in the take of a given species of fish or shellfish. Restricted access may also limit the catch allocated to each fishery participant through harvest rights such as individual or community quotas. A primary purpose of restricted access programs is to balance the level of effort in a fishery with the health of the fishery resources. In

most situations, except harvest rights, this involves setting an appropriate fishery capacity goal (California Department of Fish and Game 2001⁵).

California's Restricted Access Programs

In 1977, the California Department of Fish and Game (now CDFW) focused its first limited access program on the abalone fishery, followed in 1979 with legislation requiring Salmon limited entry permits. In the 1990s, industry began to demand more restricted access programs, so the Department decided the time had come to address restricted access in a comprehensive manner. In 1996, a limited entry review committee was formed to develop a standard restricted access policy for the Fish and Game Commission (FGC). The commission approved the restricted access policy in June 1999 (California Department of Fish and Game 2001).

Marine Life Protection Act (MLPA)

Passed by the California State Legislature in 1999, the MLPA required the California Department of Fish and Game to redesign its system of marine protected areas (MPAs) to increase its coherence and effectiveness at protecting the state's marine life, habitats, and ecosystems. For the purposes of MPA planning, a public-private partnership commonly referred to as the MLPA Initiative was established, and the state was split into five distinct regions (four coastal and the San Francisco Bay) each of which had its own MPA planning process. The planning processes for the four coastal regions was completed, and the coastal portion of California's MPA network is in effect.

Marine Life Management Act (MLMA)

The California MLMA requires CDFW and the FGC to evaluate existing restricted access programs every five years. These evaluations and increase in restricted access programs will require CDFW to expand capabilities to collect and analyze economic and social data related to fisheries. Socioeconomic data and biological data about fisheries resources are key components in developing and evaluating restricted access policy alternatives.

Federal Restricted Access Program: MSFCMA

The implementation of the MSFCMA by the PFMC and NMFS virtually eliminated all foreign fishing vessels by extending the United States jurisdiction and control over all marine fisheries resources within 200 nautical miles of the U.S. coast. The act required the establishment of eight regional fishery management councils composed of federal and state fishery management officials and industry representatives. The councils have oversight on developing, monitoring, and revising fishery management plans for each fishery within the U.S. Exclusive Economic Zone (EEZ) that requires management. Every fishery management plan drafted by a fishery management council must be approved by the Secretary of Commerce by way of NMFS.

⁵ California Department of Fish and Game. December 2001, *California's Living Marine Resources: A Status Report*, Sacramento, California.

Marine Mammal Protection Act and Endangered Species Act

The NMFS shares responsibility with the USFWS for the implementation of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) to protect of any endangered, threatened or otherwise depleted species.

RESOURCE PROTECTION GOALS

1. Improved understanding of human use impacts.
2. Allow for activities that are compatible with ecosystem health.

RESOURCE PROTECTION OBJECTIVES

1. Maintain working relationship with state and federal fisheries management agencies.
2. Track, evaluate, and address, as appropriate, existing, new, and emerging issues for their potential impacts on sanctuary resources.
3. Support adaptive management plans that promote ecosystem health.
4. Broaden and formalize partnerships between CBNMS, fishing community, and NGOs.
5. Increase awareness and monitoring of anthropogenic impacts on marine organisms in CBNMS.
6. Document and remove marine debris in CBNMS 7. Be prepared to respond to incidents with the CBNMS emergency response plan.

RESOURCE PROTECTION STRATEGIES

STRATEGY RP-1: *Establish ongoing process to track human use activities and their impacts in and around sanctuary waters.*

Activity 1.1 Work with the Sanctuary Advisory Council to establish resource protection working groups of the Sanctuary Advisory Council.

- A. Work with the Sanctuary Advisory Council to establish appropriate representation from the fishing community, other stakeholders, interest groups, NGOs and agencies to sit on resource protection working groups as needed and advise the Sanctuary Advisory Council on how to address specific types of activities that may not be compatible with the CBNMS primary purpose of resource protection.

Activity 1.2 Develop a process to continually identify trends in current, new, and emerging activities.

- A. Work with the Sanctuary Advisory Council to identify current, new, and emerging activities taking place in and around sanctuary waters.
- B. Work with the fishing community, mariners, the research community, and other resource management agencies to identify current, new, and emerging activities taking place in and around sanctuary waters.

STRATEGY RP-2: *Address the issue of ship strikes of whales in CBNMS, GFNMS and MBNMS.*

Activity 2.1 Endangered blue (*Balaenoptera musculus*), fin (*Balaenoptera physalus*) and humpback whales (*Megaptera novaeangliae*) feed within GFNMS, CBNMS, and MBNMS. Large commercial vessels also transit these sanctuaries heading to and from ports in San Francisco Bay and major ports in the Pacific Rim. The co-occurrence of these two global populations (whales and ships) in space and time creates an elevated risk of vessel strikes, and thus mortality, to whales.

- A. Continue to work with GFNMS, MBNMS, and the ONMS West Coast Region to support activities that reduce ship strikes to whales.
- B. Implement recommendations from the final report (June 2012) produced by GFNMS and CBNMS Sanctuary Advisory Council Joint Working Group on Vessel Strikes and Acoustic Impacts.
- C. Continue monitoring whale abundance with at sea surveys, land based observation points and aerial flight to collect data.
- D. Use near real time data to communicate with USCG and have a USCG advisory broadcast to vessels traveling in the vicinity of whale aggregations.
- E. Develop an education and outreach plan focused on engaging and informing the commercial maritime industry about the ship strike issue.

STRATEGY RP-3: *Profile fishing activities and communities in and around the sanctuary to better understand levels of impacts specific to CBNMS.*

Activity 3.1 Update fishing activities and socioeconomic profile for fishing in the sanctuary. Analysis would include information on numbers of boats actively engaged in each fishery; areas where the fishery is taking place; gear types; catch levels; a socioeconomic profile of the harbors and marinas accessing the sanctuary; and an understanding of markets, changing gear types, and changing fisheries management regulations that influence this profile. Information exchange

with mariners will provide important input to the profile, and provide support for continual update of the database.

STRATEGY RP-4: *Assess acoustics impacts from anthropogenic sources on sanctuary resources.*

Activity 4.1 Expand research and monitoring of acoustics in CBNMS.

- A. Gather more information and data on the effects of sound in the marine environment.
- B. Work with partners to conduct passive acoustic monitoring to identify and quantify sources of anthropogenic noise underwater and continue to be apprised of survey and monitoring activities that are evaluating the effects of sound.

Activity 4.2 Continue evaluation of individual projects with potential acoustic disturbance.

- A. Continue evaluating individual proposals on a case-by-case basis to determine impacts of proposed projects, and make management recommendations.
- B. Work with NMFS and other partners to determine acceptable sound levels in the different frequency ranges affecting wildlife.

STRATEGY RP-5: *Assess impacts from marine debris on sanctuary resources and conduct mitigation activities.*

Activity 5.1 Work with partners to expand GIS database to track and characterize type, location and amounts of benthic marine debris in CBNMS observed during benthic monitoring, mapping and characterization research activities.

Activity 5.2 Continue to monitor pelagic marine debris and incorporate into monitoring activities.

Activity 5.3 Work with partners in removing derelict fishing gear from CBNMS.

- A. Work with partners to assess the feasibility and test new methods of removing derelict fishing gear from deep water environments like Cordell Bank.
- B. Work with partners in the removal of derelict fishing gear from deep water benthic habitats.

STRATEGY RP-6: *Enhance resource protection through increased compliance with CBNMS regulations and other applicable state and federal statutes.*

The mission of enforcement for the sanctuary is to ensure compliance with the NMSA (16 USC § 1431 et seq.) and appropriate CBNMS regulations (15 CFR § 922). The approach to the enforcement program should be two-fold in nature: (1) the use of interpretive enforcement (such as public outreach) as a tool to inform and encourage voluntary compliance; and (2) the use of patrols and other traditional law enforcement methods to enforce regulations and investigate and respond to suspected prohibited activities. Together, these two programs should result in a regular and ongoing enforcement presence in sanctuary waters and compliance with CBNMS regulations.

Activity 6.1 Ensure sufficient patrol presence in the sanctuary through the development of partnerships and interagency coordination. To that end, CBNMS needs to maintain an active enforcement relationship with the USCG, NOAA OLE, CDFW, and Sonoma County Sheriff's Office (Bodega Bay).

- A. Coordinate with other enforcement authorities on patrols in CBNMS or its airspace, investigations, regulatory violations, permit violations, incidents, and citizen complaints.

Activity 6.2 Use interpretive enforcement as a tool to inform and encourage voluntary compliance with CBNMS regulations. Interpretive enforcement may be used to affect behavior and change values. Interpretive enforcement efforts will include:

- A. Train Sanctuary Naturalist Program volunteers to use interpretive enforcement (see Education STRATEGY ED-2).
- B. Develop signage program at Bodega Harbor.
- C. Work with California Department of Motor Vehicles to include informational inserts in boat license renewal packets (to be coordinated with all California national marine sanctuaries).
- D. Give presentations at yacht clubs and to Coast Guard Auxiliary Flotillas.
- E. Provide follow-up letters to possible violators with “you may be in violation” notices that inform the boater about CBNMS regulations.

Activity 6.3 Encourage and assist the efforts of local and regional port, harbor, and marina management entities and state and local agencies to improve availability and use of wastewater pump-out facilities and dump stations for vessels.

STRATEGY RP-7: *Develop a plan that prepares sanctuary staff to respond to an emergency in or adjacent to the sanctuary. This plan will provide the framework for a seamless operation in cooperation with other federal, state, and local emergency response agencies in California. The plan will be developed in coordination with GFNMS and MBNMS.*

Activity 7.1 CBNMS will review and revise its emergency response plan, based on the Incident Command System (ICS) and the USCG's Area Contingency Plan (ACP), to respond to oil spills, hazardous material spills, sunken vessels, or natural disasters. In coordination with GFNMS and MBNMS, the response plan will be reviewed, evaluated, and updated on an annual basis. CBNMS's emergency response plan will:

- A. Lay out emergency response notification plans (including all relevant agencies, user groups and media) and preparation procedures.
- B. Include coordination and decision-making responsibilities on use of dispersants.
- C. Identify specific duties for sanctuary staff.
- D. Develop damage assessment guidelines.

Activity 7.2 All appropriate sanctuary staff will be trained on an ongoing basis with regular updates and refresher courses, and will be ready to respond in the case of an emergency. Staff training to include:

- A. Understanding the ICS.
- B. Familiarization with the ACP.
- C. Assigned emergency response duties.
- D. Taking part in emergency response drills.
- E. Developing resource damage assessment skills.

STRATEGY RP-8: *Continuously evaluate the appropriateness and effectiveness of current CBNMS regulations , including permit procedures in addressing the priority resource management issues identified in the management plan.*

CBNMS uses two complementary and strategic tools to carry out an ecosystem management approach: (1) programs, which address resource management issues through the use of Education and Outreach, Conservation Science, and Resource Protection; and (2) regulations, which help establish priorities for guiding or restricting human behavior that may not be compatible with resource protection.

Activity 8.1 To ensure that CBNMS’s regulations provide protection for natural resources and address the site's priority resource management issues, CBNMS will take the following steps:

- A. Evaluate the appropriateness and effectiveness of current regulatory language on a regular basis.
- B. Propose new regulations or amendments to current regulations based on the evaluation and need for action to respond to current, new and emerging human-use activities that may be inconsistent with the CBNMS primary goal of resource protection.
- C. Provide guidance and understanding of policy in the NMSA.
- D. Ensure, to the extent appropriate, coordination and consistency with other resource management agencies’ regulations and permits.
- E. Track, review, and comment on environmental assessments and environmental impact statements prepared by other agencies.

Activity 8.2 The CBNMS permit program provides a mechanism to review requests to conduct prohibited activities within the sanctuary, and where possible, permit these activities to be conducted in a way that results in negligible effects. Generally, these requests are for research or education purposes. CBNMS staff members evaluate these requests on a case-by-case basis in detail to consider factors such as whether the activity needs to be conducted in the sanctuary; the value of the activity; the proposed methods and procedures; and the activity’s effect in the sanctuary.

- A. In order to understand, measure, and control prohibited activities within the sanctuary, and to minimize cumulative impacts from these activities, the permit program will:
 - i. Evaluate permit requests on a case-by-case basis.
 - ii. Develop permit requirements to applicants on procedures and operations to avoid or reduce impacts to sanctuary resources.
 - iii. Monitor permitted activities to ensure compliance with permit conditions and to understand direct and cumulative impacts.
 - iv. Require applicants provide the sanctuary staff with the data and findings gained through research conducted with research permits.
- B. Certain educational or research activities may violate CBNMS prohibitions, although actual environmental impacts to sanctuary resources may be negligible. A streamlined application process could be developed for activities that clearly fall within this category.

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- i. Develop a streamlined application process by creating a simple form on which applicants can submit concise and relevant information.
- ii. Develop a system to issue programmatic permits that may include many activities conducted by one organization or institution under one permit.

Resource Protection

Performance Measures

Strategy Title(s)	Performance Goal	Desired Outcome (Objective)	Outcome Measure	How Measured	Who Measures	Output Measure
Strategy RP-1: Establish process to track human use activities and their impacts in and around sanctuary waters.	Better understand and allow for activities that are compatible with CBNMS goals and ecosystem health.	1) Track, evaluate, and address, new and emerging issues for their potential impacts on sanctuary resources. 2) Support adaptive management plans that promote ecosystem health. 3) Develop "compatible use" standards for activities that complement the CBNMS primary objective of resource protection.	Improved ability to carry out a consistent and systematic evaluation of impacts from activities occurring in the sanctuary and decrease mitigatable threats.	1) Complete "compatible use" definition or threshold 2) Complete "compatibility index" framework 3) Develop series of management or policy response categories	Sanctuary Superintendent, Resource Protection Coordinator, Resource Protection Working Group, Sanctuary Advisory Council	1) Process for tracking existing, new, and emerging issues 2) Compatibility index matrix 3) Increased resource protection
Strategy RP-2: Address the issue of ship strikes of whales in the sanctuary.	Reduce ship strikes of whales in CBNMS and the region.	1) Support activities reducing ship strikes of whales, including those in Joint Working Group recommendations. 2) Monitor whale abundance. 3) Communicate whale data to USCG so they may advise mariners travelling near whales. 4) Develop education and outreach plan about ship strike issue.	Improved knowledge of whale occurrence and decreased number of ship strikes of whales in CBNMS and the region.	1) Track status and completion of planned activities 2) Record data on whale sightings 3) Record whale strikes by strikes	Resource Protection Coordinator, GFNMS, MBNMS, ONMS West Coast Region, NMFS, USCG, other partners	1) Spotter application developed, publicized and refined. 2) Advisories to mariners 3) Whales struck by ships 4) Education and outreach plan about ship strike issue.

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Strategy Title(s)	Performance Goal	Desired Outcome (Objective)	Outcome Measure	How Measured	Who Measures	Output Measure
Strategy RP-3: Profile fishing activities and communities in and around the sanctuary.	Better understand levels of impacts in CBNMS.	1) Study to understand fishing activities in CBNMS, markets for fish caught in CBNMS, relevant fishing communities, and regulations. 2) Dialogue with fishing community.	Report profiling fishing communities and activities in and around the sanctuary, supported by data.	1) Gather data on number of boats by fishery 2) Determine where/how fishing taking place 3) Gather data on catch levels and markets 4) Describe relevant fishing regulations 5) Compile all data	Resource Protection Coordinator, ONMS Chief Economist, ONMS West Coast Region	1) Profile of fishing activities and socioeconomic profile for CBNMS. 2) Database containing the fishing and community data
Strategy RP-4: Assess impacts from acoustics on sanctuary resources.	Expanded research and monitoring leading to better understanding of how sound levels by frequency affect wildlife in CBNMS.	1) More acoustics research and monitoring activities 2) Data that enables analysis of sound impacts on wildlife and can inform management recommendations.	Larger suite of acoustics research projects with results that inform management.	1) Track status and completion of acoustic research and monitoring activities 2) Evaluate projects for impacts	Resource Protection Coordinator, NMFS, other partners	1) Data on effects of sound on wildlife, including which sound levels do not lead to impacts. 2) List of passive acoustic monitoring projects 3) Evaluations of projects 4) Recommendations stemming from evaluations.
Strategy RP-5: Assess impacts from marine debris on sanctuary resources and conduct mitigation activities.	Understanding of the debris in CBNMS and mitigation of impacts from marine debris.	1) Assessment of marine debris in CBNMS. 2) Completed mitigation activities.	Description of amount and locations of marine debris in CBNMS and projects completed.	1) More data included in database 2) Protocols developed to monitor marine debris	Resource Protection Coordinator, NOAA Marine Debris Program	1) Expanded GIS database with marine debris data 2) Marine debris monitoring protocols for monthly monitoring 3) Methods for removing marine debris 3) Amount of marine debris removed

**Resource Protection Action Plan
CBNMS Draft Management Plan**

Strategy Title(s)	Performance Goal	Desired Outcome (Objective)	Outcome Measure	How Measured	Who Measures	Output Measure
Strategy RP-6: Enhance resource protection through increased compliance with CBNMS regulations and other applicable state and federal statutes.	Ensure compliance with the NMSA (16 USC § 1431 et seq.) and appropriate CBNMS regulations (15 CFR § 922).	Assessment of regulatory compliance with sanctuary regulations.	Description of level of compliance with sanctuary regulations.	1) Track number and status of regulatory infractions	Resource Protection Coordinator, NMFS, other partners	Decreased number of infractions over life of management plan
Strategy RP-7: Develop a plan that prepares sanctuary staff to respond to an emergency in or adjacent to the sanctuary.	Maintain the natural ecological processes in CBNMS.	Continue to develop partnerships to take comprehensive ecosystem protection approach.	Increased ability to respond to emergency in a coordinated and timely manner.	Review and revise plan so that it is current and relevant for emergency response activities	Sanctuary Superintendent, Resource Protection Specialist	Emergency Response Plan that provides the framework for a seamless operation in cooperation with other federal, state, and local emergency response agencies
Strategy RP-8: Continuously evaluate appropriateness and effectiveness of current CBNMS regulations in addressing the priority resource management issues.	Ensure that CBNMS regulations are addressing priority resource management issues	Review regulations on regular basis or when necessary to respond to emerging issues.	Effective protection for sanctuary resources.	Evaluate protection for sanctuary resources to ensure CBNMS regulations are effective	Sanctuary Superintendent and Resource Protection Specialist	Regulations that effectively protect sanctuary resources

KEY PARTNERS

GFNMS, MBNMS, Channel Islands National Marine Sanctuary (CINMS), Olympic Coast National Marine Sanctuary (OCNMS), advisory council for CBNMS, NOAA's National Centers for Coastal Ocean Science (NCCOS), NOAA's Coastal Services Center (CSC), USCG, NMFS, PFMC, other federal agencies, CDFW, University of California-Davis Wildlife Health Center, State Coastal Conservancy, Scripps Institute of Oceanography, other state agencies, Sonoma County Sheriff's Office, CMSF, FMSA, TMMC, National Fish and Wildlife Foundation, fishing community, shipping industry, topical experts, stakeholders/experts/user groups, and NGOs.



PARTNERSHIPS WITH COMMUNITY GROUPS ACTION PLAN

ISSUE STATEMENT

In order to fully carry out its mission, CBNMS needs to develop community partnerships to maximize its limited resources and minimize the risk of working in isolation and missing partnership opportunities. Through community partnerships, opportunities will be leveraged to develop public awareness, education, and stewardship; obtain volunteer, financial, and in-kind support; and increase research opportunities.

ISSUE DESCRIPTION

The site's primary programs are focused on conducting research, developing associated education programs, and identifying and protecting the sanctuary's natural resources and habitats. CBNMS is an offshore site that, due to its more remote location, does not have the same level of interest and support enjoyed by near-shore sanctuaries. As a result, CBNMS faces a significant challenge in effectively augmenting its unique identity in the community and increasing community interest and support.

One way to achieve the CBNMS management goals is through community partnerships. Sanctuary management functions more effectively with community support. All sanctuary managers and their staffs work with sanctuary advisory councils, community groups, and agencies to provide support in reaching out to the community and building stewardship. Working in concert with other agencies, institutions and organizations will allow CBNMS to:

- Not duplicate efforts of other agencies and community groups; and
- Have opportunities to leverage research partnerships and expertise, develop public awareness and education, build public support, and leverage and build financial and in-kind support.

PARTNERSHIPS WITH COMMUNITY GROUPS GOALS

1. Maximize partnerships to enhance the CBNMS staff's ability to identify, understand, and protect sanctuary resources.
2. Instill within the community a sense of value and stewardship of the sanctuary.

PARTNERSHIPS WITH COMMUNITY GROUPS OBJECTIVES

Create partnerships to:

1. Further research and monitoring that assist in answering resource management questions.
2. Establish a strong identity for the sanctuary within various interest groups in the community.
3. Identify and cultivate partners to increase in-kind support and, in cooperation with non-profit partners, identify potential sources of revenue.
4. Build education programs that build stewardship to support and advocate for the needs of the sanctuary.

PARTNERSHIPS WITH COMMUNITY GROUPS STRATEGIES

STRATEGY PC-1: *Develop partnerships with the research and education community to leverage opportunities and expertise to fulfill the CBNMS research and education goals.*

Activity 1.1 Collaborate with other research entities including agencies and institutions to share in-kind resources and services.

- A. Identify potential research and education partners, including other resource management agencies, marine research institutions, and individual researchers.
- B. Identify ways to collaborate with potential partners. The CBNMS staff should determine what it could offer to the partnership, including but not limited to providing ship time, housing, and/or outreach opportunities. For example, collaborations might include partnering on grants, internship programs, and symposiums.
- C. Identify opportunities for funding to support field researchers and an internship program.
- D. Partner on outreach components of research/monitoring programs (may also satisfy grant requirements).

Activity 1.2 Collaborate with other education and outreach partners such as agencies, non-profits, museums, and others to share projects, in kind resources, collaborate on shared audiences and education goals.

- A. Identify potential education partners with shared goals for education.

- B. Identify CBNMS education/outreach programs that could be accomplished through collaborations: criteria to include facilities, staff resources, related education goals and shared audiences.
- C. Identify opportunities for funding to support education/outreach interns to help with site projects.

STRATEGY PC-2: *Continue to develop the Sanctuary Advisory Council’s link to the community.*

Activity 2.1 Raise the profile of CBNMS by identifying the role of Sanctuary Advisory Council members in increasing awareness of the sanctuary and encouraging them to reach out to their constituencies and the community-at-large.

- A. Review “lessons learned” from other sanctuary advisory councils and coordinators in the ONMS to learn from successes and failures in reaching out to their community and constituencies.
- B. Provide media training to council members. Develop support materials such as PowerPoint or slide presentations for council members to use.
- C. Work with advisory council members on ways to engage constituents.
- D. Clarify and evaluate the council chair’s role, responsibilities, and expectations for representing the advisory council.
- E. Consider expanding representation on Sanctuary Advisory Council if warranted by new management responsibilities.

STRATEGY PC-3: *Use media opportunities to promote the CBNMS programs and raise its identity in Marin, Sonoma, and Mendocino counties.*

Activity 3.1 Use media opportunities to raise the identity of CBNMS within the surrounding coastal and greater communities.

- A. Identify and implement effective use of media tools to reach broad audiences (through newspaper, TV, radio). Incorporate key research findings into outreach messages.
- B. Keep the media informed about current CBNMS activities.
- C. Nurture relationships with key media individuals and organizations. Work with regular columnists to create marine-focused columns and features in the local papers. Work with local radio stations to incorporate feature stories about the sanctuary into their programming.

STRATEGY PC-4: *Identify mechanisms to raise and manage additional sources of revenue and in-kind services.*

Activity 4.1 Developing partnerships will allow the sanctuary staff to leverage resources. As the need arises, CBNMS will develop partnerships to manage and generate additional sources of revenue and in-kind support to fully implement this management plan.

- A. Coordinate with Cordell Marine Sanctuary Foundation (CMSF), a non-profit organization with a mission to support the research, education and management goals of CBNMS.
- B. Explore mechanisms such as individual donations, grants, and events to generate additional sources of revenue.
- C. Implement mechanisms to build community capacity in helping generate donations.

CBNMS Partnerships with Community Groups

Performance Measures

Strategy Title(s)	Performance Goal	Desired Outcome (Objective)	Outcome Measure	How Measured	Who Measures	Output Measure
Strategy PC-1: Develop partnerships with the research community to leverage opportunities and expertise, and fulfill the CBNMS research goals.	Maximize partnerships to facilitate the ability of the CBNMS staff to identify, understand, and protect sanctuary resources.	Create partnerships to further research and monitoring and to assist in answering resource management questions.	Increase in number of collaborative research projects within the sanctuary.	Identify and secure outside funding for research projects including in-kind services and support.	Sanctuary Superintendent, Research Coordinator	
Strategy PC-3: Use media opportunities to promote the CBNMS research programs and raise the identity of CBNMS in Marin, Sonoma, and southern Mendocino counties.	Instill within the community a sense of value and stewardship of the sanctuary.	Create partnerships to establish a strong identity for CBNMS within various interests of the community.	Increase in support from the community for CBNMS programs.	Track media coverage to determine increases in exposure.	Education Coordinator	Articles in newspapers and other media coverage
Strategy PC-4: Identify mechanisms to raise and manage additional sources of revenue.	Identify partner to raise and manage revenue.	Work with partner to raise and manage additional revenue.	Additional revenue generated by partner.	Track amount of additional revenue.	Superintendent	Additional revenue



CONSERVATION SCIENCE ACTION PLAN

PROGRAM STATEMENT

Characterization, monitoring, and research have been the cornerstone of CBNMS conservation science activities. All three activities will continue to be a high priority, and CBNMS staff members will integrate their project findings into management and education and outreach programs. Two specific areas the CBNMS staff will focus on are: (1) development of a coordinated and integrated characterization and research program for CBNMS; and (2) continuation of long-term monitoring activities.

PROGRAM DESCRIPTION

CBNMS is an intriguing site because of its high biological diversity and its remote location. As a result, scientific investigations have been taking place ever since its discovery. CBNMS is a difficult place to study on a regular basis in large part because of unpredictable and harsh offshore oceanic conditions. The first extensive study of the center piece of CBNMS, Cordell Bank, was conducted from 1977 to 1987 by Cordell Expeditions. The researchers documented life on the Bank in over 3000 photographs, considerable film and video footage, and a large collection of biological specimens.

Since 1997, CBNMS and GFNMS have been involved in exploration and investigation of the marine life and habitat of the site through an Ecosystem Dynamics Study. This long-term study focuses on the distribution and relative abundance of krill, an important building block in the food chain for this area. Through the use of acoustics and net sampling, krill are located and identified. The physical parameters influencing their distribution are investigated. These data are analyzed along with seabird and marine mammal sightings to better understand why marine life concentrates in particular areas of the sanctuary. This program evolved into a partnership with PBCS in 2004 and now called Applied California Current Ecosystem Studies (ACCESS).

Remotely operated vehicles (ROV) and other technology are used to characterize the benthic biota and habitats in CBNMS. In September 2001, sanctuary biologists and partners conducted initial surveys of the Bank with the Delta submersible, characterizing habitats and documenting species distribution and abundance. CBNMS conducted these studies between 2001 and 2005 to increase the understanding of this unique environment and to better manage the sanctuary's resources.

CONSERVATION SCIENCE GOALS

1. Increase our knowledge and understanding of the CBNMS ecosystem.
2. Develop new and continue ongoing research programs to identify and address specific resource management issues.
3. Develop new and continue ongoing monitoring programs to understand long-term status and trends to guide management.

CONSERVATION SCIENCE OBJECTIVES

1. Characterize the habitats and communities of CBNMS; evaluate and synthesize characterization data and information.
2. Continue monitoring activities to identify indicators and understand natural variation and impacts from human activities on the CBNMS marine ecosystem.
3. Recommend research and monitoring results for inclusion in CBNMS's outreach and education programs.
4. Develop new and continue existing partnerships with other agencies and institutions.

CONSERVATION SCIENCE STRATEGIES

STRATEGY CS-1: *Prepare an oceanographic climatology report.*

Physical oceanography is integral to the CBNMS ecosystem and is not well understood. To fully characterize the sanctuary, a complete and detailed understanding of the oceanographic and atmospheric conditions in and around the sanctuary is needed.

Activity 1.1 Prepare an oceanographic climatology report summarizing existing knowledge about the physical oceanography and meteorology of this region. This information will expose voids and shortcomings in the existing data, and serve as a guide for designing future programs.

- A. Conduct short-term data analyses from compiled data.
- B. Using existing data, construct a climatology of the oceanographic and meteorological conditions in and around CBNMS and GFNMS. This document will contain figures, diagrams, satellite images, and tables that illustrate the prevailing environmental conditions, together with text that interprets, synthesizes, and summarizes this information. The report will deliver recommendations to the sanctuary management for future studies that are needed to characterize the physical environment in and around the sanctuary.

STRATEGY CS-2: *Map and characterize CBNMS's habitats.*

Habitat maps will provide important baseline information for management including: relative proportions of sanctuary habitats; the current state of sanctuary resources as a basis against which to measure future change; unique habitats; unique potential habitat for species of concern including essential fish habitat; and extent of habitat damage from human disturbance.

Activity 2.1 Conduct sonar surveys to determine habitat types and their spatial extent, specifically delineate: (1) rocky regions and outcrops within low relief soft bottom areas of sanctuary; (2) soft and mixed sediments within the Bank region; (3) trawl disturbance in soft sediments; (4) submerged cultural resources; and (5) soft and hard bottom habitats associated with Bodega Canyon.

- A. Survey entire extent of sanctuary using sonar technology. Analyze information to develop fine-scale bathymetry maps, habitat maps, and submerged cultural resources. This information can be used in conjunction with biological surveys to produce habitat suitability models for selected species.
- B. Habitat maps created using sonar systems will be ground truthed using data collected by manned submersible, ROV, and Autonomous Underwater vehicle (AUV) surveys over high relief rocky regions of the sanctuary and towed camera systems and grabs over low relief unconsolidated substrates.
- C. Incorporate research findings into CBNMS education/outreach and management programs and messages.

STRATEGY CS-3: *Characterize the soft-bottom epifaunal communities of CBNMS.*

Epifauna are animals that live in contact with the sea bottom, either moving freely over the substrate or attached to it.

Activity 3.1 Survey the surface biota and sediment characteristics of the soft-sediment portion of the shelf and slope of CBNMS.

- A. Conduct survey of soft-bottom habitats of CBNMS. Survey will provide habitat assessment, estimates of distribution and abundance of epifauna, assessment of disturbance effects and marine debris, species list of invertebrates, and description of any submerged cultural resources.
- B. Results from this survey will be used to refine the habitat map.
- C. Create partnerships to continue monitoring epifaunal communities over time.

STRATEGY CS-4: *Characterize soft-bottom infaunal communities of CBNMS.*

Infauna are animals that live within or burrow through substrate.

Activity 4.1 Characterize the infaunal biota of the soft sediment portion of the shelf and slope of CBNMS.

- A. Conduct literature review to obtain current knowledge about infaunal communities. Relevant sources may be the United States Environmental Protection Agency (USEPA) status and trends information; Bureau of Ocean Energy Management (BOEM) reports; invertebrate collections made by NMFS/Northwest Fisheries Science Center (NWFSC) slope and shelf trawl surveys; and regional universities and research institutions.
- B. Conduct baseline survey of infaunal communities of CBNMS using bottom grabs. Survey should determine species diversity, distribution, and abundance, as well as describe characteristics of the sediment. Design sampling so that temporal variability of infaunal community can be assessed and correlated to changing oceanographic conditions.
- C. Utilize partnerships to continue monitoring infaunal communities over time.
- D. Use results to ground truth habitat map.

STRATEGY CS-5: *Collect, inventory, and catalog new and previously unsorted CBNMS benthic invertebrate specimens.*

Activity 5.1 Continue to populate voucher specimen database of benthic invertebrates from CBNMS; these specimens are maintained to provide permanent, physical documentation of species identifications and associated data resulting from inventories.

- A. Collections of CBNMS specimens at California Academy of Sciences (CAS) will be taxonomically upgraded, computer catalogued, and maintained by CAS as research specimens.
- B. Coordinate with CAS to maintain a computerized species list for CBNMS and provide the data to the sanctuary staff for future investigations.
- C. Target specimens of interest for subsequent identification, description, and future publication.
- D. Coordinate with CAS to identify and describe sponge species collected from CBNMS, including not-yet-described species.

Activity 5.2 Continue to collaborate with CAS on collection and identification of other CBNMS benthic invertebrates.

- A. Partner with CAS on future taxonomic identification, database maintenance, and expansion of specimen collection.

STRATEGY CS-6: Survey available museum collections, data archives, and literature indexing services for CBNMS specimens, data, and publications.

Activity 6.1 Conduct a literature, specimen, and data search to compile existing knowledge about Cordell Bank, and generate a verified species list. Methods should include:

- A. Search natural history museums and other collections for specimens collected from CBNMS.
- B. Search standard literature indexes for references to CBNMS. Secure regular access to Lexus-Nexus and/or other literature indexes for CBNMS.
- C. Search agency and academic electronic databases (i.e., metadata clearing houses) for data from CBNMS.
- D. Construct and maintain a verified species list and store in an easily accessible data repository (such as National Data Center or Sanctuary Integrated Monitoring Network [SIMoN]).

STRATEGY CS-7: *Understand the function and variability of pelagic ecosystems.*

Activity 7.1 Continue ACCESS with GFNMS and partners to quantitatively assess the distribution and abundance of marine birds, mammals, and sea turtles relative to ocean conditions, seasons, and biological productivity. This study provides long term data on production, populations, and trophic structure, and it will continue to support management.

- A. Physical oceanography will be described with data collected in the field and from remotely sensed data. Data will be collected on salinity and temperature at sea surface and at depth. Remote data will include upwelling indices, satellite images, and current information.
- B. Systematically survey along transect lines and record the presence of marine birds, mammals and sea turtles within CBNMS and GFNMS.
- C. Assess biological productivity by sampling zooplankton and phytoplankton using hydro-acoustics and net sampling.
- D. Use an echosounder to map the distribution of zooplankton and fish.
- E. Observe and document human activities within CBNMS and GFNMS.

STRATEGY CS-8: *Continue monitoring fish and invertebrate assemblages and marine debris in relation to the fine-scale habitat on and adjacent to the hard bottom areas of CBNMS.*

Activity 8.1 Perform submersible, ROV, or AUV field surveys (one- to three- year intervals) to monitor the distribution and abundance of fishes and invertebrates on and adjacent to the hard bottom areas. This project will include the following components:

- A. Assess and monitor distribution, abundance, and life history (size and maturity) of fishes around Cordell Bank and other hard bottom areas.
- B. Assess and monitor percent cover of invertebrates and distribution and abundance of specific macroinvertebrate species.
- C. Identify locations and quantity of derelict fishing gear and other benthic marine debris using submersible transects and video footage.
- D. Use video transects and rock grab samples to further characterize habitats identified by the sonar survey.
- E. Compare the biota of Cordell Bank with other deep reefs along the west coast (e.g., Bowie Seamount in British Columbia, Point Sur Bank in California, and Heceta Bank in Oregon).
- F. Determine the fish assemblages associated with different habitat types.

STRATEGY CS-9: *Continue to manage and store data in easily accessible and secure formats and locations. Data collected by CBNMS should be accessible to interested public and should be securely stored to prevent loss.*

Activity 9.1 Maintain handwritten records from research cruises. Records will be kept in the CBNMS office and the second set kept offsite. These records provide information that help (e.g., location, time) describe the sampling environment.

Activity 9.2 Electronic media collected on research cruises (files and tapes) will be copied and stored in the CBNMS office. Electronic media (files and video tapes) provide the detailed information (e.g., water temperature profiles, number of organisms observed).

Activity 9.3 Data obtained from laboratory analyses of video transects or plankton collections will be stored in a relational database, modeled after the National Park Service's (NPS's) Natural Resources Database Template. All electronic data are available to sanctuary staff through the CBNMS local area network. Since the relational databases comprise the core of the CBNMS research program, copies of the databases are housed on an off-site computer to guard against catastrophic loss.

Activity 9.4 Ensure data are compliant with federal standards for accessibility and quality, and formatted to be compatible with Federal Geospatial Data Center (FGDC) and other relevant agency initiatives (e.g., the Integrated Ocean Observing System [IOOS]).

STRATEGY CS-10: *Assess the role of Cordell Bank in the supply and receipt of fish larvae within the regional marine ecosystem by linking population genetics and oceanography.*

Activity 10.1 Determine the genetic make-up of adult, juvenile and larval populations of fish with pelagic larval stages within the Cordell Bank region relative to regional populations to understand levels of mixing and retention of early life history stages.

- A. Collect adult, juvenile, and larval stages of several common species with pelagic larvae from Cordell Bank as well as at multiple locations north and south of the Bank within the California Current System. Conduct genetic analyses on collected individuals to determine likely birthplaces of individuals.

Activity 10.2 Examine larval dispersal through simulations of coupled bio-physical models.

- A. Develop or modify an existing 3-D bio-physical simulation model to determine: 1) the geographic fate of larvae released from Cordell Bank; 2) the geographic origin of larvae that are likely to settle on Cordell Bank. Examine predicted dispersal patterns for larvae with different behavioral characteristics as well as larval periods. Examine predicted dispersal patterns given various oceanographic conditions.

STRATEGY CS-11: *Assess potential to conduct additional research activities in the future, when time and resources allow.*

Activity 11.1 Assess potential to conduct the following research activities, which originated from various sources including: 1) discussions of the Conservation Science working group that was assembled during the JMPR process; 2) comments received during the JMPR process; and 3) assessment report of the condition of CBNMS resources.

- A. Quantify Temporal Patterns of Gelatinous Zooplankton. Use of Tucker trawl or vertical haul sampling and acoustics to assess seasonal and interannual patterns of abundance and community composition of gelatinous zooplankton as part of the CBNMS pelagic monitoring program.
- B. Assess Primary Productivity within the CBNMS Ecosystem. Examine spatial and temporal variability in primary productivity and phytoplankton standing stock using simulated *in-situ* and photosynthesis-irradiance incubations coupled with satellite remote sensing data of ocean color.
- C. Directed Oceanographic Field Studies. Use of current meter arrays and acoustic Doppler current profiler to measure currents at different levels in the water column around Cordell Bank, drifters to track motion at and near the surface, and remotely-sensed observations from satellites to provide information on both local and regional conditions.

- D. Marine Mammal Observations Using Ships of Opportunity. Use of volunteer observers riding on ships of opportunity (e.g., wildlife viewing trips) to survey the distribution and abundance of marine mammals.
- E. Understanding the Emerging Role of Humboldt Squid in the CBNMS Ecosystem. Use of submersible or ROV to conduct surveys within CBNMS to acquire basic information on squid abundance and distribution. Use of hook and line sampling to assess squid foraging habits and diet.
- F. Geomorphology of Cordell Bank and Nearby Shelf and Slope Subsurface Geology. Collect sub-bottom profile data and synthesize with rock samples from Cordell Bank to summarize the subsurface geology and surficial geomorphology of the region.
- G. Water quality assessment. Assess potential environmental degradation of sanctuary waters arising from certain changing physical processes and anthropogenic inputs by reviewing and summarizing existing data sets to better understand the potential water quality threats to the sanctuary waters.
- H. Benthic contaminant assessment. Assess potential environmental degradation of benthic habitats and bottom dwelling species (as well as transfer further along the food chain) arising from concentrations of contaminants such as pesticides, hydrocarbons, and heavy metals by collecting and analyzing benthic samples.

CBNMS Conservation Science

Performance Measures

Strategy Title(s)	Performance Goal	Desired Outcome (Objective)	Outcome Measure	How Measured	Who Measures	Output Measure
<p>Strategy CS-1: Prepare oceanographic climatology report.</p> <p>Strategy CS-2: Map and characterize habitats.</p> <p>Strategy CS-3: Characterize epifaunal communities.</p> <p>Strategy CS-4: Characterize infaunal communities.</p>	Increase our knowledge and understanding of the CBNMS ecosystem.	Characterize the habitats and communities of CBNMS.	Increased understanding of: oceanographic and atmospheric conditions; relative abundance and distribution of habitats; epifaunal and infaunal benthic communities.	Complete site characterization including: detailed oceanographic climatology; clear delineation of habitat types; use surface biota and soft bottom characteristics to ground truth habitat types; cross reference infaunal with habitat mapping to cross-reference results.	Sanctuary Superintendent, Research Coordinator, research partners	<p>1) Oceanographic climatology report with effective maps and graphics</p> <p>2) Fine scale bathymetric and habitat maps</p> <p>3) Technical data summary on infaunal and epifaunal communities</p>
<p>Strategy CS-5: Collect, inventory and catalog benthic invertebrate specimens.</p> <p>Strategy CS-6: Survey museum collections, data archives, and literature indexing for specimens.</p>	Increase our knowledge and understanding of the CBNMS ecosystem.	Characterize the habitats and communities of CBNMS.	Increase understanding of species diversity.	<p>1) Complete verified species inventory.</p> <p>2) Taxonomically upgrade, catalog, and maintain specimen collection.</p>	Sanctuary Superintendent, Research Coordinator, research partners	<p>1) Computerized voucher specimen database</p> <p>2) House invertebrate voucher specimens</p> <p>3) Confirmed species list</p>
<p>Strategy CS-7: Characterize pelagic ecosystems.</p>	Develop research programs to identify and address specific resource management issues.	Determine monitoring objectives and indicators and conduct a comprehensive monitoring program.	Increase understanding of oceanographic habitats and communities (short-term); and detect and evaluate impacts from anthropogenic or natural perturbations (long-term).	<p>1) Quantitatively assess the distribution and abundance of marine mammals and seabirds.</p> <p>2) Assess biological productivity (food) and assess human activity and oceanographic conditions. Cross-reference for correlation.</p>	Sanctuary Superintendent, Research Coordinator, advisory council research panel, research partners	<p>1) Technical data summaries</p> <p>2) Fine-scaled seasonal/annual distribution maps</p>

Conservation Science Action Plan
CBNMS Draft Management Plan

Strategy Title(s)	Performance Goal	Desired Outcome (Objective)	Outcome Measure	How Measured	Who Measures	Output Measure
Strategy CS-8: Maintain fish and invertebrate monitoring.	Maintain monitoring programs to understand long-term status and trends to guide management.	Characterize the habitats and communities of CBNMS.	Track changes to ecosystem over time and correlate to environmental conditions and to human use.	Characterize CBNMS habitats and characterize and monitor faunal communities, while identifying locations and quantities of anthropogenic impacts.	Sanctuary Superintendent, Research Coordinator, research partners	1) Technical data summary 2) Peer reviewed articles 3) Workshop presentations

KEY PARTNERS

GFNMS, MBNMS, NCCOS, NMFS (including its Santa Cruz Laboratory), National Weather Service (NWS), United States Geological Survey (USGS) Coastal and Marine Geology Program, CDFW, San Francisco State University (SFSU) Romberg – Tiburon Lab, BML, Moss Landing Marine Laboratories (MLML), PBCS, CAS, Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), Census of Marine Life, Cordell Expeditions, US Seabed, and a contractor.



ADMINISTRATION ACTION PLAN

PROGRAM STATEMENT

In order to build a management plan that is effective in addressing the priority site-specific and cross-cutting resource management issues, CBNMS will need to strengthen its infrastructure by adding staff and financial resources to its base budget. In addition to basic infrastructure needs, some administrative areas that will be addressed include: building partnerships; improving interagency coordination; and addressing regulatory and enforcement issues.

PROGRAM DESCRIPTION

At its designation in 1989, the operation and management of CBNMS was combined with that of the adjacent GFNMS, then known as the Point-Reyes Farallon Islands National Marine Sanctuary. In 1998, a separate budget was allocated to manage CBNMS independently of GFNMS and over the next few years additional staff were hired along with a sanctuary superintendent in 2003. In 2014, CBNMS has a staff of five federal employees and two contractors.

The ONMS provides oversight and coordination among a system of fourteen marine protected areas (thirteen national marine sanctuaries and Papahānaumokuākea National Marine Monument) by developing a framework for resource management, and directing program and policy development. The sanctuary superintendent oversees site-specific management functions including implementation of the management plan. The management plan makes use of two complementary and strategic tools for ecosystem management: (1) programs, or action plans, carried out through research, education, and marine resource protection programs, and (2) regulations for controlling or restricting human behavior that is not compatible with resource protection. The sanctuary superintendent establishes who is responsible for implementing specific programs, provides an administrative framework to ensure that all resource management activities are coordinated, and provides and manages an appropriate infrastructure to meet the goals and objectives of the management plan. The sanctuary superintendent reports to the ONMS West Coast Regional Director. The sanctuary superintendent represents the ONMS and is the primary spokesperson for CBNMS.

The ONMS is committed to coordinating with other federal, state, and local agencies in a continuous ecosystem management process. This process is designed to ensure the long-term protection of the unique resources of this region, while considering the demands of multi-use interests. Because of the complexity of managing the activities and resources in the sanctuary, cooperative efforts are necessary to effectively meet CBNMS goals. Overlapping jurisdictions,

Administration Action Plan
CBNMS Draft Management Plan

different agency mandates, and limited resources necessitate the development of a management plan that brings together multiple institutions for the common purpose of ecosystem management. Achieving the long- and short-term goals for this region requires the development of close and continuing partnerships.

ADMINISTRATIVE STRUCTURE

Thirteen national marine sanctuaries and one marine national monument are managed by the ONMS. A management plan that is coordinated and consistent with the NMSA is prepared by ONMS for each site. The site superintendent monitors the effectiveness of the management plan, both regulations and programs, and may propose changes when necessary. The site superintendent coordinates efforts to protect and manage sanctuary resources with other federal, state, regional, and local agencies.

SANCTUARY SUPERINTENDENT

The CBNMS superintendent makes decisions on the annual allocation of funds for site-specific resource protection needs. The superintendent coordinates with regional staff on enforcement activities, violations, and emergencies. The superintendent also evaluates overall progress toward the resource protection objectives of the ONMS.

SANCTUARY STAFF

Under the direction of the sanctuary superintendent, the sanctuary staff is directly responsible for implementation of the management plan. Although each staff member is assigned to one of the program areas, collectively the staff is responsible for coordinating their efforts in addressing all the priority resource management issues.

SANCTUARY ADVISORY COUNCIL

The Sanctuary Advisory Council has been structured in accordance with the NMSA and national guidelines developed by the ONMS. The Sanctuary Advisory Council, with its expertise and broad based representation, offers advice to the sanctuary superintendent on resource management issues and decisions. The 2009 CBNMS Advisory Council Charter provides for seven nongovernmental representatives from stakeholder groups. They may have alternates. The Charter also provides for two non-voting governmental representatives and their alternates; the superintendent may sit on the Sanctuary Advisory Council as a non-voting member, as do the superintendents of GFNMS, MBNMS and Channel Islands National Marine Sanctuary. The Sanctuary Advisory Council is representative of a broad-based constituency to ensure that the superintendent has relevant information upon which to make management decisions. The Charter is reviewed for renewal every five years.

IMPLEMENTATION OF THE MANAGEMENT PLAN

Each of CBNMS's program areas—Education and Outreach; Conservation Science; and Resource Protection—has an associated action plan for implementing the management plan.

These action plans are designed to directly address resource management issues and guide management of CBNMS over the next five to ten years.

The action plans presented in the management plan address current resource management issues identified as priorities by the sanctuary staff during the management plan review process. The implementation of these action plans is highly dependent on available staffing and financial resource allocation.

CBNMS administration provides an organized structure and support system for implementing management strategies while providing the flexibility and guidance necessary to address changing, new, and emerging resource management issues.

OTHER MANAGEMENT TOOLS

With limited staff and financial resources, partnerships are an integral part of successful ecosystem management of CBNMS. The sanctuary superintendent may draw from a selection of standard management tools to formalize relationships with other federal, state and local agencies or the private sector. Examples of these agreements are a Memorandum of Understanding or Agreement, a Letter of Understanding or Agreement, an Interagency Agreement, a Cooperative Agreement, a grant, or a contract.

ADMINISTRATION GOAL

1. Build a strong foundation which supports the development of: effective program areas; a strong regulatory framework; effective enforcement, and an array of partnerships. This foundation will allow for growth and flexibility in addressing the priority issues and recommendations laid out in the management plan.

ADMINISTRATION OBJECTIVES

1. Develop a structured administrative framework to continuously evaluate, maintain, and expand as necessary, administrative operations.
2. Identify appropriate staffing, budget levels, and facility needs to support implementation of the management plan.
3. Continue to build on partnerships, collaborative efforts, and coordination with other agencies, institutions, and organizations.

ADMINISTRATION STRATEGIES

STRATEGY AD-1: *CBNMS will expand its facilities to include satellite offices, visitor centers, signage, and vessels located throughout the region as necessary to support implementation of the management plan.*

Additional CBNMS facilities may be developed through various partnerships with GFNMS, and the public and private sectors. Currently, CBNMS's main office is located in Bear Valley on the grounds of PRNS near Olema, California.

Activity 1.1 Increase presence in Bodega Bay, the nearest access point to CBNMS, by opening a satellite office and visitor center with GFNMS that would serve both research and outreach needs and assist in the further development of partnerships.

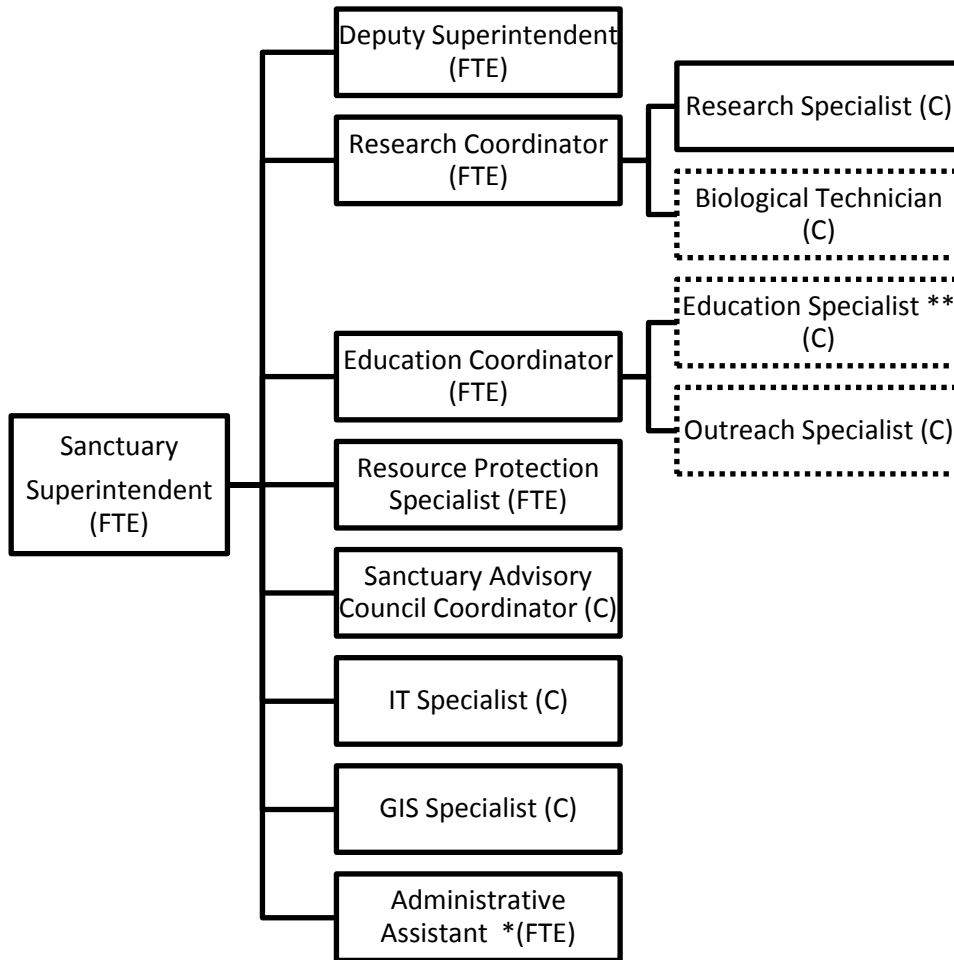
Activity 1.2 Work with the PRNS to identify intern/researcher housing options on park lands. These facilities may also include wet labs for researchers' use. Several possible sites (existing buildings) have been identified and preliminary investigations into potential partnerships are taking place. Formalized agreements may include CBNMS providing restoration and maintenance funds in return for use of the building(s).

Activity 1.3 Increase the sanctuary staff's ability to access the marine waters of the sanctuary by contracting more vessel time on the NOAA R/V FULMAR to support research and monitoring efforts. This effort will include annual vessel time planning for research and education programs. Vessel planning will include NOAA ship time and chartered boat time.

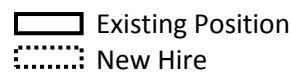
STRATEGY AD-2: *CBNMS will fill basic staffing requirements to provide support for administration and the program areas of conservation science, education and outreach, and resource management.*

Activity 2.1 CBNMS staff skills should collectively represent expertise in policy, marine resource management, education, outreach, volunteer development, research, monitoring, geographic information systems (GIS), information technology, and administration. The actual number and expertise of staff will depend on budget allocations and the operating priorities of CBNMS. In order to meet the objectives of this management plan, minimum staffing requirements have been proposed (see figure below).

**Cordell Bank National Marine Sanctuary
Proposed Staffing Plan**



- * Requires budget and finance experience
- ** Requires web page experience
- FTE Full Time Equivalent Federal Employee
- C Contractor



Activity 2.2 Each staff member must exhibit general knowledge about all CBNMS program areas and the ability to effectively communicate with constituents, other professionals, and the community at large. In an effort to attract and maintain a consistent and high caliber staff base, the CBNMS superintendent will encourage and support staff participation in professional development.

STRATEGY AD-3: *With limited staff and financial resources, CBNMS will develop partnerships and identify outside funding sources and in-kind services to assist in the implementation of the management plan.*

Activity 3.1 In partnership with regional research and educational institutions and agencies, establish a CBNMS-supported internship program with graduate students to assist the sanctuary staff with monitoring, research, and education priorities.

Activity 3.2 Maintain and expand informal working relationship with federal, state, and local agencies. Partnership activities include coordination on education and outreach projects, research projects, data analysis, and cruise operations.

STRATEGY AD-4: *Support the Sanctuary Advisory Council in its primary roles of providing advice to the sanctuary superintendent and serving as a liaison between CBNMS and the sanctuary community.*

Activity 4.1 In consultation with the Sanctuary Advisory Council, strengthen the structure of the council by: evaluating and amending as necessary the Sanctuary Advisory Council charter; evaluating and developing organizational strategies to enhance the Sanctuary Advisory Council's level of participation and effectiveness; evaluating and adjusting, if necessary, Sanctuary Advisory Council membership; and providing support to help the Sanctuary Advisory Council develop a respected voice in the community.

Activity 4.2 Identify the role of the Sanctuary Advisory Council in addressing resource management issues by developing a format for assisting in the building of CBNMS policies and procedures.

Activity 4.3 Provide support, resources, and guidance to help the council engage and educate the public about current, new, and emerging resource management issues in the sanctuary.

Activity 4.4 Working groups will be convened by the Sanctuary Advisory Council, as needed, to focus on specific issues and to allow for participation by additional stakeholders and community experts.

STRATEGY AD-5: *CBNMS will formalize intra- and interagency partnerships to ensure coordination and cooperation with federal, state, and local jurisdictions within or adjacent to the sanctuary. NOAA and CBNMS recognize all other authorities in and around sanctuary waters as important components of effective ecosystem management.*

Activity 5.1 CBNMS will engage other agencies in reviewing each other's proposed actions, responding to Environmental Impact Statements, participating in CBNMS panels and working groups. Building agency relationships allows for: coordination of the development of policies at the federal, state and local level; the sharing of research and education resources; and the opportunity to work together to identify resource management issues.

Activity 5.2 CBNMS will formalize agreements with federal co-trustee managers signaling that the cooperative and integrated management approach established for CBNMS has been adopted by other agencies. To formally implement cooperative management of the sanctuary, a number of separate types of agreements may be entered into, including: cooperative agreements, memoranda of understanding, memoranda of agreement, and consultation.

Activity 5.3 CBNMS will formalize agreements for the following programs: (1) Protected Resources Enforcement Plan (USCG, NMFS, Sonoma County Sheriff's Department, CDFW); and (2) Emergency Response Plan (local, state and federal emergency response agencies). **STRATEGY AD-6:** *Develop and make use of performance indicators to measure effectiveness of the management of the sanctuary as a whole, as well as to evaluate specific strategies within the management plan.*

Performance Evaluation

As part of an effort to improve overall management of sanctuaries, ongoing and routine performance evaluation is a priority for the ONMS. Both site-specific and programmatic efforts are underway to better understand the CBNMS staff's ability to meet the objectives outlined in each of the action plans. Performance evaluation has many other benefits, including:

- Highlighting successful (or not so successful) efforts of site management;
- Keeping the public, Congress, and other interested parties apprised of sanctuary management effectiveness;
- Helping management identify resource gaps so that they may better manage their sites;
- Improving accountability;
- Improving communication among sites, stakeholders and the general public;
- Fostering the development of clear, concise and, whenever possible, measurable outcomes;
- Providing a means for superintendents to comprehensively evaluate their sites in both the short and long term;
- Fostering an internal focus on problem solving and improved performance;
- Providing additional support for the resource allocation process; and
- Motivating staff with clear policies and a focused direction.

Performance Evaluation Goal

1. Ensure that CBNMS's management plan strategies are producing effective results in addressing the priority resource management issues identified in the management plan.

Performance Evaluation Objectives

1. CBNMS will continuously measure and evaluate the successes and challenges of the strategies put forth in the five-year management plan.

Administration Action Plan
CBNMS Draft Management Plan

2. Based on the outcome of these evaluations, CBNMS will modify existing programs and make recommendations for the future that best support the CBNMS primary objective of ecosystem protection.

Activity 6.1 CBNMS staff will conduct routine performance evaluations to collect and record data on CBNMS performance over time. Using this data, staff will determine the effectiveness of management plan strategies by (a) evaluating progress towards achievement of each action plan's desired outcomes and (b) assessing the role or added value of those outcomes in the overall accomplishment of site goals and objectives.

Activity 6.2 An annual assessment on the implementation of the CBNMS management plan will be conducted. This assessment will be conducted internally by CBNMS staff who will consider the progress and effectiveness of activities implemented over the previous year. In this activity, successes or weaknesses of specific activities will be determined. Activities deemed less than successful in achieving desired outcomes will be addressed to correct or improve the outcomes/outputs. Successful activities will be recognized with application of positive lessons learned to other programs.

Activity 6.3 Performance data will be generated from internal annual assessment and shared with advisory council to determine if management strategies need to be changed to better meet their stated targets. The targets themselves may also be analyzed to determine their validity (if, for instance, they are too ambitious or unrealistic given current site capacity to address during a particular year). This activity will be conducted with the management plan review which takes place every five to ten years.



CROSS-CUTTING ACTION PLANS CBNMS DRAFT MANAGEMENT PLAN

- I. Cross-Cutting Introduction**
- II. Administration and Operations**
- III. Community Outreach**
- IV. Ecosystem Monitoring**
- V. Maritime Heritage**

CROSS-CUTTING INTRODUCTION

Cordell Bank (CBNMS), Gulf of the Farallones (GFNMS), and Monterey Bay (MBNMS) National Marine Sanctuaries are located adjacent to one another along a 350-mile stretch of the north-central California coast. All three sanctuaries are managed by the Office of National Marine Sanctuaries (ONMS), share many of the same resources and issues, and have some overlapping interest and user groups. There are many opportunities for these sites to work cooperatively, share assets, and address resource management issues in a coordinated manner.

The three sanctuaries coordinate on many important resource management issues, such as oil spills and monitoring. However, each site is, for the most part, managed independently of the others. The three sanctuaries have separate advisory councils and independent education, research and resource protection programs.

In February 2004 ONMS established the Northern Management Area (NMA) of Monterey Bay National Marine Sanctuary extending from the San Mateo/Santa Cruz line northward to the existing boundary between Monterey Bay and Gulf of the Farallones sanctuaries. The Gulf of the Farallones assumed full administrative and management responsibilities of the NMA in March 2004. Existing Monterey Bay sanctuary regulations and congressional prohibitions apply in the Northern Management Area. MBNMS continues to manage its Water Quality Protection Program in San Mateo County. During the Joint Management Plan Review a Northern Management Area Transition Action Plan was developed and published in the 2008 management plans for the respective sanctuaries under the Cross-Cutting Action Plan. Many of the strategies have been implemented since the publication of the plan. Ongoing Strategies have been incorporated into this publication of the Cross-Cutting Action Plan.

GOALS

The goal of the cross-cutting action plans is to build upon existing coordination efforts and identify some activities that should be jointly implemented so that these three sites can operate as integrated and complementary sites to better protect the sanctuaries' resources. This will ensure scarce program resources are used more efficiently and result in a more consistent and coordinated delivery of programs, products and services to the public. Cross-cutting actions plans were developed to address: Administration and Operations; the Northern Management Area; Community Outreach; Maritime Heritage; and Ecosystem Monitoring. Though the implementation of other activities contained in the site-specific plans may also be effectively coordinated, the cross-cutting action plans would be jointly developed and implemented across the three sites.

IMPLEMENTATION WITHIN THE CONTEXT OF A REGIONAL STRUCTURE

ONMS efforts to address certain priority issues in a cross-cutting framework was a first step in a larger effort to begin looking at sanctuary resource management issues in a regional or ecosystem-based context. Since the cross-cutting plans were developed, the ONMS adopted a regional management structure, comprised of four regions, including a West Coast region, which is led by a regional director. The purpose of this structure is to maximize program integration among the ONMS sites, regions, and national program and to other state and federal programs and partners – across all levels. The regional structure dedicates program leadership and regional staff resources directly towards integrating programs and forging partnerships that supports NOAA’s evolving ecosystem-based management approach.

The regional director and staff are based in the region and dedicate their efforts towards addressing priority regional issues and capitalizing on regional opportunities and partnerships. Some of their expertise and responsibilities includes working closely with individual sanctuary staff to coordinate the implementation of certain cross-cutting action plans or projects, such as regional ecosystem monitoring, community outreach, or maritime heritage. Individual sanctuaries may also either take or share the lead for implementing the cross-cutting action plans.



ADMINISTRATION AND OPERATIONS CROSS-CUTTING ACTION PLAN

GOALS

The goals of the cross-cutting Administration and Operations Action Plan are to (1) improve and sustain coordination and cooperation across the three sanctuaries to better and more efficiently manage and protect sanctuary resources, and (2) for the individual sites to continue working and functioning as an integrated team. Fulfilling these goals for the three sanctuaries requires enhanced communication and collaboration among and between superintendents and program staff.

ISSUE DESCRIPTION

During scoping meetings for the JMPR, the ONMS received many comments relating to the need to coordinate various administration and operations across the sites. The three advisory councils and sanctuary staff identified several of these issues as priority items to address in the management plan review. These include:

- Improving resource management consistency and efficiency
- Expanding coordination and communication between sites and to the public
- Evaluating emergency response capabilities in the region, and clarify and coordinate the sanctuary's role in relation to other agencies
- Developing a mechanism to address current and emerging issues between the sites
- Coordinating research/monitoring, education/outreach, and enforcement activities

ADDRESSING THE ISSUE

Each of the three sanctuaries developed site-specific administration and operations action plans to address the staffing and infrastructure needed in order to implement their new management plans. In contrast, this cross-cutting administration and operations plan targets some activities that will be implemented by all three sites in order to improve communication and maximize their ability to collaborate and cooperate on many important resource management and program areas.

STRATEGY XAO-1: *Improve internal communications among the three sanctuaries.*

Successful collaboration and coordination among sanctuaries is related to the amount and intensity of communication. This strategy focuses on improving communications between the sites to ensure there are regular opportunities for the superintendents, staff and the advisory councils to learn what is happening at each of the three sites and jointly plan regional programs and activities.

Activity 1.1 Maintain regular communications between the sanctuary superintendents.

Superintendents will engage in informal (impromptu phone calls) and formal (regularly scheduled calls or meetings) communications. GFNMS and MBNMS superintendents will meet monthly by phone to discuss common issues.

Activity 1.2 The west coast superintendents will meet monthly by phone with the West Coast Region staff to discuss regional issues and will meet annually in person to develop annual regional priorities.

Activity 1.3 Maintain a new employee orientation program that includes information from the three sanctuaries and the ONMS.

If funding allows, the orientation program will include travel to the other sites to meet staff and learn about their program and activities. These efforts should be coordinated with similar efforts at headquarters.

Activity 1.4 The program coordinators will meet at least once per year to share information and plan joint activities prior to the development of the annual operating plans.

In cooperation with the regional office, the regional lead for each program will facilitate bringing this group together, either via conference call or in person if budgets allow.

Activity 1.5 Schedule annual joint advisory council chair and sanctuary superintendent meeting.

The MBNMS and GFNMS advisory councils currently meet biannually to discuss issues and program activities in the MBNMS NMA. GFNMS and CBNMS advisory councils will meet jointly on an annual basis to discuss the expansion area.

Activity 1.6 Encourage and provide opportunities for site staff to give presentations at each other's advisory council meetings.

Superintendents, council chairs and coordinators should encourage program staff presentations at each other's meetings.

STRATEGY XAO-2: *Improve the efficiency and cost-effectiveness of program operations and administration.*

Each of the three sanctuaries has been designated for over twenty years and during this time has accumulated an inventory of equipment, vessels and resources to support their own research/monitoring, education/outreach, and resource protection programs. This strategy recognizes there are instances in which it is more cost-effective to share resources among the sites and some instances when it may be more appropriate for each site to have their own. Currently each sanctuary office is responsible for managing most of its own administration and information technology functions, including contracts, procurements, time and attendance, travel orders and vouchers, websites, databases, and geographic information systems. Each site employs a varying number of staff or contractors to perform some of the administrative tasks. The goal of this strategy is to evaluate the staffing plans at the sites and maximize opportunities to share personnel and implement methods to make routine administrative functions more efficient. The strategy also highlights the importance of building upon existing efforts to share information technology resources.

Activity 2.1 Contact and inform the other sites early in the planning stages of field operations to provide opportunities to plan joint missions and to share information and data.

Individual sites may have program personnel, technology or information that would benefit the field operations of another site.

Activity 2.2 As opportunities arise, create short-term opportunities for staff exchanges, rotations, details and informal staff loans for specific projects or to fulfill on-going needs across the West Coast Region.

In addition to sharing valuable technical expertise, staff exchanges provide opportunities for professional development of program staff.

Activity 2.3 Participate in each other's interview panels to review candidates for new and vacant positions, where possible.

This is particularly important when hiring for positions that work with other sites on a regular basis.

Activity 2.4 Cordell Bank and Gulf of the Farallones superintendents and other planning staff will discuss administrative and operational needs and expectations related to the expansion area.

Staff will meet to determine needs and best opportunities for efficiency in addressing the management of the new expansion area. This relates to all programs, shared staffing, and budget allocation across the two sites.

Activity 2.5 Evaluate alternative management strategies for offshore portions of northern expansion areas.

GFNMS and CBNMS superintendents and WCRO will conduct a series of discussions regarding the most efficacious means to manage the offshore portions of the expanded areas of GFNMS and CBNMS, ensuring effective marine science, outreach and resource protection.

STRATEGY XAO-3: *Improve the coordination of sanctuary resource protection activities and programs.*

Each of the three site-specific management plans proposes various strategies to address their own resource protection programs (e.g., regulations/permitting, emerging issues, enforcement, emergency response). This strategy is aimed at improving the communication and coordination of resource protection activities across the three sites. The strategy addresses the need to improve staff understanding and awareness of all of the three sites' regulatory and permit processes and activities. Secondly, it establishes a process to identify and, when appropriate, jointly address emerging issues in a regional capacity. This includes coordination with local, state and other federal entities. Third, it recommends the development of a regional sanctuary emergency response plan so that the ONMS is better prepared to address emergencies on a regional scale. Finally, it identifies the need to comprehensively evaluate enforcement needs in relation to the new management plans and develop and implement a regional enforcement plan.

Activity 3.1 Improve staff awareness and understanding of each site's regulations.

Establish a basic and consistent understanding of each site's regulations. Ensure all staff have and are familiar with the portion of the WCRO web page which consolidates the management documents for the West Coast Region: regional regulations, terms of designation and management plans. Produce a table listing all regulations of West Coast sanctuaries.

Activity 3.2 The West Coast sanctuaries will continue to work closely on any future proposed regulatory changes that could affect other sites. The GFNMS and MBNMS Resource Protection Teams will closely coordinate on any future proposed regulatory changes that could impact the NMA.

Activity 3.3 GFNMS will facilitate a public process in the next five years to consider whether the San Francisco Exemption Area should be incorporated into the MBNMS.

Such an action would require changing the MBNMS regulations and designation document and require coordination with MBNMS staff, and approval from the MBNMS Superintendent. Public scoping for this process was initiated in 2012.

Activity 3.4 The West Coast sanctuaries will share responsibilities for preparing regional permits. GFNMS will be responsible for permit activities in the NMA.

West Coast sanctuaries will inform each other of any new permit applications or other activities that could affect any of the sanctuaries. GFNMS will process permits within the NMA, except for water quality permits, which will continue to be overseen by MBNMS.

Activity 3.5 MBNMS staff will continue to implement Water Quality Protection Program activities including conducting site water quality needs assessment, review water quality permits and authorizations.

MBNMS Water Quality staff will participate on Technical Advisory Committees that implement strategies within the WQPP Action Plans, implement volunteer water quality monitoring events including First Flush and Snapshot Day, review and comment on NPDES permits, respond to discharges entering the MBNMS NMA, coordinate and collaborate with partners participating in the Agriculture Water Quality Alliance, and oversee monitoring of Areas of Special Biological Significance in a sub-contract to the San Mateo Resource Conservation District.

Activity 3.6 Coordinate emerging issues among the West Coast sanctuaries and develop coordinated strategies to address emerging issues

As an individual site staff identifies emerging issues, staff members will determine the significance and potential to impact another site, and communicate this to the potentially affected site(s). They will jointly determine if a new or emerging issue needs action and identify a strategy and activities to address the issue, depending on whether it is an immediate or long-term threat, what is (or is not) known about it, and if there are adequate resources to address it properly.

Activity 3.7 Implement West Coast Region emergency response plan.

The West Coast Region emergency response plan addresses broad emergency response issues that affect the region, identifies ONMS staffing responsibilities and expertise, and outlines how the ONMS will coordinate with existing federal, state and local emergency response agencies in California. GFNMS staff will lead efforts to coordinate and implement site-specific activities to respond to emergencies in the NMA.

Activity 3.8 Coordinate with the ONMS Damage Assessment Team on populating and making the Sanctuary Hazardous Incident Emergency Logistics Database System (SHIELDS) functional and operative for the three sanctuaries and integrating it with the existing SIMoN database.

Activity 3.9 Continue to work closely on enforcement activities in the region.

Regional enforcement staff will coordinate and cooperate on enforcement activities as they relate to other sites. GFNMS staff will provide assistance as appropriate in the planning and implementation of enforcement activities in the NMA and will coordinate with MBNMS to ensure consistency across sites.

TABLE XAO-1: MEASURING PERFORMANCE OF THE CROSS-CUTTING ADMINISTRATION & OPERATIONS ACTION PLAN

Desired Outcome(s) For This Action Plan:	
Improved communication and coordination among Sanctuary staff resulting in more integrated and coordinated resource protection for Sanctuary resources.	
Performance Measures	Explanation
Increase the number of cross-cutting Annual Operating Plan (AOP) activities that each site includes in their site-specific AOP each year.	One of the primary purposes of this action plan is to increase the amount of communication and interaction among the three sites. This action plan identifies specific opportunities for staff to interact, resulting in more coordinated planning and implementation of joint activities that address priority issues. The tangible results of these interactions will be formulated within each site's AOP.

KEY PARTNERS

CBNMS, GFNMS, and MBNMS (superintendents, program coordinators, and site staff); Advisory Councils Chairs for CBNMS, GFNMS, and MBNMS; General Council Ocean Service (GCOS); NOAA OLE; NOAA General Counsel Enforcement Section (GCES); NOAA Hazardous Materials (HAZMAT); United State Coast Guard (USCG); National Park Service (NPS); California State Parks; California Department of Fish & Wildlife; California State Lands Commission (CSLC); and County Sheriff Departments.



COMMUNITY OUTREACH CROSS-CUTTING ACTION PLAN

GOAL

A coordinated, collaborative regional community outreach strategy will build awareness throughout north-central California and beyond about (1) the existence and purpose of the three sanctuaries, the West Coast region, and the ONMS; (2) the diverse natural resources and ecosystems of each sanctuary and why they need protection; (3) the relevance of these ecosystems to people; (4) the economic and intrinsic value of the three sanctuaries to coastal and inland communities beyond such direct industries as fishing and ecotourism; (5) how these three sanctuaries are working with constituent groups; and (6) how individuals and groups can be engaged in helping the sanctuaries accomplish their resource protection, research, and education goals.

ISSUE DESCRIPTION

Under the ONMS, each sanctuary in the system conducts education and outreach activities to build broad public awareness about the existence and purpose of our nation's marine sanctuaries. The ONMS recognizes a well-informed local, regional, and national constituency greatly enhances the ability of the sanctuaries to protect their natural and cultural resources. Therefore, outreach activities should provide local and state governments, businesses, non-governmental organizations, constituent groups, and the general public with the information necessary to be effective partners in the stewardship of sanctuary resources.

This cross-cutting action plan identifies appropriate regional audiences and topics, regional outreach strategies, and marketing and media exposure efforts that effectively highlight specific program activities across all three sites, the region and the national system. It is also designed to complement each site-specific program and to be flexible enough to incorporate new strategies and topics over time.

Effective community outreach is accomplished through a continuous cycle of ocean and coastal outreach, education, and stewardship. Community outreach expands awareness, knowledge and ultimately changes attitudes and behaviors. By finding information on ocean and coastal resources, and stewardship opportunities in which to get involved in the sanctuary, people begin to have a personal relationship with the sanctuary and may be more likely to become ambassadors helping to protect sanctuary resources. Community outreach involves three

strategies tailored to the specific needs and interests of a given audience and may be delivered by members of that audience.

Outreach provides audiences with sanctuary-related information and materials promoting ocean and coastal stewardship.

Education provides fundamental scientific understanding, knowledge, training, or professional development on topics relevant to the world's atmosphere, climate, oceans and coastal ecosystems, and resource protection.

Stewardship is a personal sense of responsibility to take informed action and make caring choices, at home or work, which promote and protect the health of our coasts and oceans.

STRATEGY XCO-1: *Build upon and expand existing ocean and coastal outreach*

This strategy is aimed at raising general awareness of marine ecosystems, individual national marine sanctuaries and the national marine sanctuary system, and inspiring stewardship of ocean and coastal resources. Outreach provides audiences with sanctuary-related information and materials based on NOAA science, products, and services that promote ocean and coastal stewardship. These audiences may be: north-central California coastal residents; people who live and work in inland California communities that regularly visit the ocean, such as divers, kayakers, tidepoolers, etc.; those who make their living within the ocean environment, like fishermen, maritime shipping companies, etc.; or people who live outside California that care about the ocean even though they may never visit. These, and others, are important voices in the protection and stewardship of the oceans. Key target audiences and messages should also be closely coordinated with outreach needs identified in the issue-related action plans.

Activity 1.1 Develop or strengthen coordinated regional outreach programs and opportunities.

Outreach staff should coordinate on public service announcements, issue-specific workshops and brochures (e.g., tide pool etiquette), docent programs, signage, learning centers, exhibits and displays at community events that encompass or represent the region.

Activity 1.2 Plan and conduct regional sanctuary outreach events.

Outreach staff should promote the importance of national marine sanctuaries, conservation science and resource protection programs, working together to improve understanding of marine conservation and management.

Activity 1.3 Develop and implement joint media communications plan, e.g., print, radio, TV, Internet.

Media personnel at respective sites should coordinate with the WCRO media liaison to develop a plan.

Activity 1.4 Identify and partner with external programs and partners to incorporate sanctuary-related messages, identify best practices and achieve common goals.

Regional outreach personnel should work together to target partners and programs that can effectively communicate ONMS messages on a regional level, and assign appropriate leads to initiate contact and follow-up.

STRATEGY XCO-2: *Enhance and coordinate ocean and coastal education*

This strategy focuses on building community knowledge and fostering caring actions and attitudes targeting priority issues identified in the management plans. The ONMS's joint ocean and coastal education efforts provide a fundamental understanding grounded in science, knowledge, training, and/or professional development to a particular audience on topics identified as important to protect sanctuary resources. There are many possible audiences such as students, teachers, state and local agencies, community leaders, and the general public. Sanctuary-related educational activities are based on NOAA science, systematic in design with clear goals, objectives and measurable outcomes; aligned, where appropriate, with state or national education standards; and designed to facilitate evaluation by a third party.

Activity 2.1 Collaborate on existing site-specific education programs and products as a means to enhance and expand educational offerings.

Each year, the education staff will jointly meet to identify collaborative projects for inclusion in their respective AOPs.

Activity 2.2 Take a multicultural/multilingual approach to all outreach efforts.

Assess demographics of geographic areas with programming and ensure multicultural relevance to diverse audiences. Develop multicultural educational curricula and materials in response to demographic assessment.

Activity 2.3 Identify and implement new education programs that can be developed jointly with other sites.

Education leads should identify and implement new programs as needs arise and as budgets allow.

STRATEGY XCO-3: *Enhance ocean and coastal stewardship*

Marine sanctuary stewardship is a personal sense of responsibility to take informed action and make caring choices, at home or work, which promote and protect the health of our coasts and oceans. A steward develops attitudes, motivations, and commitments that are reflected in informed decisions and responsible actions. Stewards can be individuals, members of groups, or entities that influence others' opinions and actions about the oceans. Stewardship can be demonstrated through a variety of means, including:

Community Outreach Cross-Cutting Action Plan
CBNMS Draft Management Plan

Volunteering for an organized stewardship program,
Taking personal action to protect our ocean sanctuaries,
Providing informed public input into decisions regarding the sanctuaries, and
Informing others regarding marine ecosystems and the sanctuary program.

Similar to the audiences for outreach, ocean and coastal stewards may be north-central California coastal residents, people who live and work in inland California communities that regularly visit the ocean, those who make their living within the ocean environment, or people who care about the ocean even though they may never visit.

Activity 3.1 Create, maintain and promote sanctuary and partner volunteer programs.

Cultivate volunteers to provide opportunities for stewardship as well as expand resource protection, education, and outreach capabilities of the three sanctuaries.

Activity 3.2 Create new ways to inspire coastal and ocean stewardship in local communities.

The three sites will conduct needs assessments with targeted constituents and audiences to identify innovative and creative methods of engaging specific groups of people in sanctuary activities. Some examples include working with tourism industry, faith-based or cultural organizations, retired citizens or local art groups.

Activity 3.3 Identify partners to incorporate stewardship messages.

Regional outreach personnel should work together to target partners that can effectively communicate ONMS stewardship messages, and assign appropriate leads to initiate contact and follow-up.

Table XCO-1: Measuring Performance of the Cross-Cutting Community Outreach Action Plan

Desired Outcome(s) For This Action Plan:	
Expand joint education and outreach efforts in a manner enhancing protection for Sanctuary resources and the delivery of programs and services to local communities.	
Performance Measures	Explanation
Increase the number of joint education and outreach efforts directed at communities	One of the main purposes of this action plan is to expand general awareness of the three sanctuaries, develop joint education products addressing priority issues, and increase involvement of individuals in the stewardship of the resources in the three sanctuaries. Some of the programs directed at local communities include schools and teachers, volunteers, fairs and festivals, visitor centers, public lecture series, etc.

KEY PARTNERS

CBNMS, GFNMS, MBNMS, CINMS, OCNMS, West Coast Region Office, NMFS, NOAA OLE, USCG, NPS, USEPA, California Coastal Monument, other federal agencies, California State Parks, Elkhorn Slough National Estuarine Research Reserve, other state agencies, Association of Monterey Bay Area Governments, Association of (SF) Bay Area Governments, Sonoma County Regional Parks, cities, local parks/recreation departments, Advisory council members from all three sanctuaries/working groups, FMSA, Monterey Bay and Channel Islands Sanctuary Foundation, Stewards of Coast and Redwoods, Fort Ross Conservancy, local NGOs/non-profits, Save Our Shores, The JASON Project, SIMoN, Community Outreach Working Group, Snapshot Day Water Quality Monitoring Event, Long-term Monitoring Program and Experiential Training for Students (LiMPETS), Beach Watch, Beach Coastal Ocean Mammal/Bird Educational and Research Survey (Beach COMBERS), MBNMS Team Ocean Conservation Education Action Network (OCEAN), Global Learning and Observation to Benefit the Environment (GLOBE), Bay Net, traditional and electronic media (both coastal and inland, local and national, including local weekly papers, community access TV stations, social media), California Ocean Communicators Alliance (Thank You Ocean), pollution prevention programs, chambers of commerce, shipping trade associations, tourism trade associations, dive clubs/shops, kayak clubs/shops, spot abalone divers, other recreational groups, natural history museums, institutions with community service requirements/marine sciences (high schools, colleges), state/local volunteer programs, high school/college classes doing coastal monitoring, multicultural community leaders, and bilingual school programs.



ECOSYSTEM MONITORING CROSS-CUTTING ACTION PLAN

GOALS

The cross-cutting goal of coordinated ecosystem monitoring across CBNMS, GFNMS and MBNMS is to better (1) determine the current and anticipate the future status of sanctuary resources; (2) understand the limits of variation in resources; (3) detect temporal and spatial changes in resources; (4) identify potential agents of change; and (5) provide scientific information that can guide management decisions on priority issues.

INTRODUCTION

One of the express purposes and policies of the National Marine Sanctuaries Act is that long-term monitoring of sanctuary resources be supported, promoted, and coordinated (16 U.S.C. 1431). Sanctuaries also promote data collection to assess resource or environmental change with respect to implemented management actions. The suite of monitoring information required by sanctuary management includes data from within the sanctuary and from areas outside the boundaries that influence sanctuary waters.

For the most part, individual sanctuaries work independently to develop monitoring programs and partnerships to inform their management concerns. These programs typically rely on substantial support from other government, private, and academic institutions at the federal, state, and local levels. The program designs are often only indirectly influenced by sanctuary management responsibilities.

Undertaking ecosystem monitoring requires long-term comprehensive assessments and broad scale integration of data collected in a wide variety of habitats (e.g., coastal interface, subtidal, continental shelf, shelf break, and deep water) and in areas that directly influence them (e.g., watershed, estuaries, coastal currents). Such assessments and integration can only be achieved through coordination with multiple partners focused on a variety of resources and geographic scales. Because the three sanctuaries of Cordell Bank, Gulf of the Farallones, and Monterey Bay have contiguous boundaries, they protect and manage many of the same habitats types and living resources, some of which range throughout the combined area. As such, the sanctuaries should consider each other as primary partners in monitoring efforts to evaluate the status and trends of these shared resources. Coordination among the three sanctuaries to promote, conduct, integrate, and synthesize data from ecosystem monitoring activities is the most effective and efficient

means to improve availability of information for resource conservation and management across the region.

The combined areas of CBNMS, GFNMS and MBNMS also represent a substantial portion of California coastal waters. Regional sanctuary monitoring coordination across this extensive area will help promote sanctuary management concerns as a driver for large-scale monitoring initiatives and partnerships. The data collected from coordinated efforts will be useful at the local and regional scale, with the potential for influencing resource management actions throughout a substantial portion of the West Coast.

ADDRESSING THE ISSUE

Most of the monitoring data that informs sanctuary management are not financed, collected, or analyzed by the sanctuaries. Instead, sanctuaries support and promote these activities indirectly by providing vessel time, staff support, and equipment, and coordinating the interests and information of outside agencies and partners. They also assist in securing outside funding that can be directed toward projects that address sanctuary information needs such as SIMoN.

Indirect support is appropriate to enhance capacities of the sanctuary programs to meet the mandate of resource protection. Such expertise to collect and analyze the variety of information required for management needs is accessible through partnerships with various research institutions. However, effective resource management requires a holistic view, which sanctuaries are uniquely positioned to achieve. To meet their resource management mandate, sanctuaries must synthesize and integrate information from disparate research and monitoring projects. They have the further responsibility of interpreting and applying available scientific knowledge for resource managers and the public. Thus, coordination of ecosystem monitoring efforts requires strategic action on various sanctuary-specific programmatic levels.

Recommended strategies focus on coordinating existing activities, identifying opportunities for additional coordination, and establishing the administrative infrastructure, advisory panels, and oversight mechanisms required to support, direct, and evaluate coordinated monitoring across the three sanctuaries. Because many of the monitoring requirements common to CBNMS, GFNMS, and MBNMS overlap with the interests of CINMS and OCNMS, the strategies recommended in this proposed action plan should serve as a model for expanded coordination of appropriate monitoring activities across all five of the West Coast sanctuaries. The strategies are also consistent with efforts of the System Wide Monitoring Program (SWiM) to improve collection, evaluation, and interpretation of monitoring information throughout the sanctuaries. Thus, these activities promote system and regional integration across the program as well as improving ecosystem conservation and management in the combined area of the three sanctuaries.

STRATEGY XEM-1: Coordinate existing targeted monitoring activities to promote greater efficiency and effectiveness.

Priority activities for initiation of joint ecosystem monitoring within the region should be focused on the coordination of existing sanctuary-specific monitoring programs that assess

similar ecosystems in at least two of the three sanctuaries. This includes coordinating targeted programs that monitor conditions in the coastal interface and the pelagic/offshore systems.

These priorities are based on the need to establish common ecological monitoring efforts throughout the region and the priority issue areas identified in the management plan that could best be addressed through a coordinated approach among the sanctuaries. Some of the priority habitats that have been identified for joint monitoring include: rocky intertidal shores, deep sea benthos and pelagic/open ocean. The coordination channels and activities established to support these targeted efforts could serve as a model for additional monitoring coordination in the future. Other existing or newly emerging monitoring activities, not identified in this action plan, represent potential opportunities for additional coordination. Assessment of such opportunities is addressed in Strategies XEM-2 and XEM-3.

Activity 1.1 Regional science staff should coordinate regarding intertidal monitoring programs.

Coordinate individual sanctuary rocky intertidal monitoring programs and continue to collaborate with other large-scale rocky intertidal monitoring efforts, such as PISCO and MARINE.

Activity 1.2 Beach Watch and Beach COMBERS will continue to collaborate on sharing information on the health of seabirds and trends in beachcast wildlife.

GFNMS Beach Watch staff should evaluate the feasibility of expanding existing citizen science monitoring in the expansion area.

Activity 1.3 Maintain and expand ACCESS integrated sanctuary marine mammal, seabird and sea turtle surveys.

CBNMS and GFNMS science staff should evaluate the feasibility of expanding existing at-sea monitoring to the expansion area.

Activity 1.4 Regional science staff should coordinate regarding benthic habitat surveys.

Jointly develop research cruise plans and standards for sampling and reporting results for benthic habitat survey work. Augment the benthic habitat survey work with new technologies such as ROV and AUV surveys.

STRATEGY XEM-2: *Implement existing regional ecosystem monitoring activities.*

Over the last decade, many federal and state agencies have actively participated in collaborative efforts to develop and implement integrated coastal and ocean observing and data management systems. To further these efforts, the ONMS, and many individual sanctuaries, have been working closely with their partners to build upon and integrate existing site monitoring programs into regional ecosystem monitoring programs. The following activities have been identified as

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pilot programs within the ONMS to test the concept of integrating observation data and making it available to resource managers and the public.

Activity 2.1 Continue the West Coast Observation Project at CBNMS, GFNMS and MBNMS.

The West Coast Observation Project integrates ocean observation data collected at OCNMS, CBNMS, GFNMS and CINMS. The project focuses on data streams collected at numerous new instrument moorings installed at specific locations within each of the four sanctuaries. The project intends to make the monitoring data accessible via the Internet in an IOOS compatible format. The data from this project would be best shared through the Central and Northern California Ocean Observing System (CeNCOOS).

Activity 2.2 Develop and implement an integrated Sanctuary System-Wide Monitoring (SWiM) program for CBNMS, GFNMS and MBNMS by publishing Condition Reports and collaborating with CeNCOOS.

The primary purpose of the SWiM program is to monitor specific ecological parameters of the sanctuary and ensure the timely flow of data and information to those responsible for managing and protecting resources in the ocean and coastal zone, and to those that use, depend on, and study the ecosystems encompassed by the sanctuaries. It also provides a reporting strategy, through Condition Reports, to enable the evaluation of status and trends in protected resources and activities that affect them. These efforts will be integrated with SIMoN, which implements the monitoring, coordinates with partners, and provides GIS, Web and other products that allow for local and regional information sharing, as well as through CeNCOOS.

Activity 2.3 Continue expanding the Sanctuary Integrated Monitoring Network (SIMoN).

SIMoN is the primary mechanism to coordinate data and information among the sites. CB, GF and MBNMS have their monitoring projects summarized with available data and images on the SIMoN website. This information is linked to the National Program monitoring summary. Joint interactive maps, images and “what’s new” items are also available. Project information and new cross site tools will continue to be developed as needed.

Activity 2.4 Look for partnerships to support ecosystem monitoring.

Collaborate with NMFS on the California Current Integrated Ecosystem Assessment and integrate this into SIMoN ecosystem assessments.

Activity 2.5 Look for innovative ways to support ecosystem monitoring.

Evaluate and identify ongoing funding opportunities to support regional and larger scale ongoing monitoring activities.

STRATEGY XEM-3: *Establish a joint internal monitoring coordination team.*

Coordination of monitoring activities among the sanctuaries requires an administrative infrastructure to identify and act on cross-boundary opportunities, collaborate with large-scale initiatives, and interpret the results for resource managers and public audiences across the region.

Activity 3.1 Continue to coordinate research and monitoring across CBNMS, GFNMS and MBNMS.

CBNMS, GFNMS, and MBNMS coordinate on the use of the research vessel FULMAR. In addition, GFNMS and CBNMS coordinate and partner on offshore monitoring which includes the NMA. Finally, monitoring information from all sites is shared through the SIMoN web page and interactive maps.

Activity 3.2 The CBNMS, GFNMS, and MBNMS science staff will continue to work jointly with the site and West Coast Region media staff to develop a research and communications plan

Activity 3.3 Develop annual ecosystem-based research and monitoring operating plans in collaboration with each other to meet site, regional, and national monitoring needs. CBNMS, GFNMS and MBNMS science staff should share research and monitoring information between sites as annual operating plans are developed.

TABLE XEM-1: MEASURING PERFORMANCE OF THE CROSS-CUTTING ECOSYSTEM MONITORING ACTION PLAN

Desired Outcome(s) For This Action Plan:	
Increased collaboration among, capacity of, and productivity of the three sanctuary monitoring programs in order to enhance our understanding of the ecosystem(s) in this region and those natural and human factors affecting them.	
Performance Measures	Explanation
<p>1. Increase the number of cooperative research and monitoring activities.</p> <p>2. Continue to include Cordell Bank and Gulf of the Farallones in SIMoN and expand its infrastructure so that it can be integrated with other coastal and ocean observation systems along the West Coast.</p> <p>3. Design and implement coordinated monitoring programs consistent with the ONMS System Wide Monitoring Framework (SWiM) at each site.</p>	<p>1. Research staff from the three sanctuaries currently engage in limited joint research and monitoring activities. However, to improve our knowledge and understanding about the broader ecosystem in this region, the three sites need to coordinate and systematically plan and implement joint research and monitoring activities with each other and other partners. These new joint research and monitoring activities will be reflected in each sites' AOP.</p> <p>2. SIMoN is rapidly evolving into a system-wide tool for organizing and displaying research and monitoring related information for MBNMS, GFNMS, and CBNMS. In addition, SIMoN has evolved so other regional coastal and ocean observation systems could be integrated within SIMoN.</p> <p>3. The ONMS has been working for several years to develop a System Wide Monitoring (SWiM) Program Framework. The program is underway and ready to be implemented at MBNMS, GFNMS, and CBNMS, particularly through Condition Reports..</p>

KEY PARTNERS

CBNMS, GFNMS, MBNMS, CINMS, OCNMS, WCR), NCCOS, NMFS, NESDIS, National Coastal Data Development Center (NCDDC), National Oceanographic Data Center (NODC), National Data Buoy Center (NDBC), NOAA National Estuarine Research Reserve System (NERRS), advisory councils, NPS, USEPA, USFWS, BOEM, USGS, BML, University of California-Santa Cruz (UCSC), State of California, Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), Multi-Agency Rocky Intertidal Network (MARINe), Southern California Coastal Water Research Project Authority (SCCWRP), Tenera Inc., Kinetic Labs, Inc., SIMoN, Coastal Observation and Seabird Survey Team (COASST), California Cooperative Oceanic Fisheries Investigations (CalCOFI), Monterey Bay Aquarium Research Institute (MBARI), Alliance for California Current Ecosystem Observation (ACCEO), NCDFW, Ocean-US, SWiM, Southeast Area Monitoring and Assessment Program (SEAMAP), Integrated Ocean

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Observing System (IOOS), CeNCOOS, MBNMS RAP, CBNMS RAP, FMSA, Monterey Bay and Channel Islands Sanctuary Foundation, and PRCS.



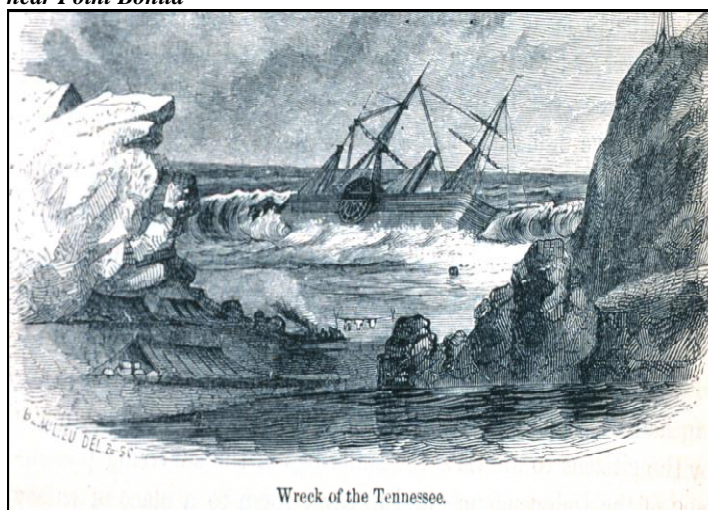
MARITIME HERITAGE CROSS-CUTTING ACTION PLAN

GOALS

The ONMS has developed the Maritime Heritage Program (MHP), to identify, protect and raise awareness of the cultural and historical resources in sanctuaries. The MHP's efforts include conducting paleo-ecological and archaeological studies; inventorying, locating, and monitoring both historic shipwrecks and those that pose an environmental threat to sanctuary marine resources; and characterizing and protecting maritime heritage resources.

This cross-cutting plan provides the framework for a maritime heritage resources program that addresses historic and cultural underwater sites, as well as traditional heritage resources such as Native American and fishing communities, commercial marine transport of passengers and cargo, and recreational activities like diving, surfing, and boating. This maritime cultural landscape of the region involves understanding the broader context of specific places that encompasses human activities. This includes indigenous people of our nation's pre-historic and historic past as well as today's modern cultures and their sacred places; geography; paleontology; archaeology; traditional knowledge and sociocultural studies; oral traditions; commercial and recreational fisheries; recreation activities, maritime heritage resources such as lighthouses, piers, wharves, lifesaving stations, abandoned dog-hole ports and landings and working waterfronts, revealing the many human communities that overlap with marine environments in our national marine sanctuaries and contiguous waters. Although the ONMS only has authority to protect sanctuary cultural and historic resources, the program recognizes that traditional user and ocean-dependent groups are interconnected with the sanctuaries and are an integral part of their history.

Figure MH-1: The passenger-cargo steamer Tennessee runs aground near Point Bonita



ISSUE DESCRIPTION

The NMSA and site regulations mandate the management and protection of sanctuary cultural and historical resources. Cultural resources are defined as any historical or cultural feature, including archaeological sites, historic structures, shipwrecks, and artifacts. *Historical resources* are defined as any resources possessing historical, cultural, archaeological or paleontological significance, including sites, contextual information, structures, districts, and objects significantly associated with or representative of earlier people, cultures, maritime heritage, and human activities and events. Historical resources include “submerged cultural resources,” and also include “historical properties,” as defined in the National Historic Preservation Act (NHPA), as amended, and its implementing regulations, as amended.

The area encompassed by CBNMS, GFNMS, and MBNMS has a long and interesting maritime history. The sea floor preserves remnants of the sites where people lived and of the vessels in which they conducted trade and fought wars. Ships, boats, wharves, lighthouses, lifesaving stations, fort, dog-hole ports, whaling stations, prehistoric sites, and a myriad of other heritage treasures lie covered by water, sand, and time in GFNMS and MBNMS. To date, no submerged cultural or historic resources have been discovered in CBNMS.

The history of California’s north-central coast is predominantly a maritime one. From the days of the early Ohlone, Coast Miwok, and *Kashia* Pomo inhabitants to the exploration and settlement of California to the present, coastal waterways remain a main route of travel, subsistence, and supply. The heritage of the first peoples has been and is today represented not only in the sites of former settlements but also by the traditions and heritage of those people, who have persisted as important members of the coastal community. Their place names, their memories and their traditions remain on these shores and waters whether written on a map or not.

Ocean-based commerce and industries (e.g., fisheries, shipping, military, recreation, tourism, extractive industries, exploration, research, and aesthetics) are important to the maritime history, the modern economy, and the social character of this region. These constantly changing human uses define the maritime cultural landscape of these sanctuaries and help interpret our evolving relationship with the sanctuary resources. Ports such as San Francisco and Monterey, and smaller coastal harbor towns, developed through fishing, shipping, and economic exchange. Today these have become major urban areas, bringing millions of people in proximity to national marine sanctuaries. Many of these people are connected to the sanctuaries through commercial and recreational activities such as surfing, boating, and diving.

Records indicate that 787 vessel and aircraft losses were documented between 1595 and 2013 along California’s north-central coast from Cambria north to Manchester, including the Farallon Islands. To date, 392 in GFNMS, 395 in MBNMS, and none in CBNMS have been documented. Some sites have been located and inventoried by NOAA and the NPS. Although some vessels were later salvaged or refloated, some artifacts associated with wrecking events may still exist. GFNMS and MBNMS have also collaborated with state and federal agencies,

and the private sector to gather resource documentation and to create opportunities to locate and record submerged archaeological resources. GFNMS and MBNMS maintains shipwreck inventories, created from established shipwreck databases, ongoing historical research and field surveys. GFNMS and MBNMS are also faced with the challenge of identifying and monitoring historic and non-historic shipwrecks posing environmental threats to sanctuary marine resources. Lurking in the deep are the hazardous cargoes, abandoned fuel, and unexploded ordnance inside sunken vessels that are slowly deteriorating in a corrosive marine environment.

Submerged Site Inventory and Assessment Initiative

ONMS regulations mandate that archaeological resources are managed consistently with the Federal Archaeological Program. The ONMS's MHP was established to emphasize the need for research, education, outreach, and protection of maritime heritage resources. Issues to be addressed regarding inventorying, assessing, and protecting submerged archaeological are below..

Shipwrecks as Environmental Threats

GFNMS and MBNMS both coordinate with the Damage Assessment Restoration Fund and other relevant agencies. GFNMS and MBNMS will work with CINMS to expand their efforts to identify shipwrecks that may pose environmental threats and will provide pertinent information to NOAA's Hazardous Materials (HAZMAT) division and the NMSP for development of the Sanctuaries Hazardous Incident Emergency Logistics Database System (SHIELDS) and the Resources and Under Sea Threats (RUST) Geographic Information Systems (GIS) database systems.

Site Protection

As submerged shipwreck sites are inventoried in the sanctuaries and become more visible to the public, they are also more at risk from divers wishing to remove artifacts. GFNMS, and MBNMS will consider enhancing visitor usage while mitigating damage to heritage resources by providing the sport and commercial diving communities and visitors to shoreline sites with interpretive information about archaeological sites and their protection. Sanctuary and California state regulations prohibit the un-permitted disturbance of submerged archaeological and historical resources. The ONMS and California State Lands Commission (CSLC) have an archaeological resource recovery permit system in place. Protection and monitoring of these sites will become a more pronounced responsibility in the sanctuaries' heritage resources management program. Partnerships will be established with local law enforcement agencies for site monitoring and compliance of public access to submerged sites.

Traditional User and Ocean-Dependent Groups

There is the potential to cultivate partnerships with local, state, and federal programs (e.g., American Folk Life Center, universities, Department of the Interior) and the identified communities. These partnerships could aid in the design and implementation of studies of living

maritime heritage and folk life to help educate the public about traditional cultures and practices including Native Americans, other ethnic residents, fishermen and economic activities reflecting historic human interaction with the ocean.

Education and Outreach

GFNMS, and MBNMS have partnered with CINMS and OCNMS in the development of the West Coast Shipwreck Database online curriculum. The database serves to inform the public about the historical significance of shipwrecks, including those posing environmental threats to sanctuary marine resources, e.g., the *Jacob Luckenbach* story. The database is being expanded to include living journals assisting families searching for information about shipwrecked vessels their relatives may once have served on as crewmembers or passengers. Family members are encouraged to share with the public their living journals associated with the shipwreck histories for dissemination. CBNMS, GFNMS, and MBNMS will identify partners to explore exhibit development at maritime or regional museums and learning centers that focus on the areas' maritime heritage history; shipwrecks, exploration, fishing, and fisheries; vessel trades, routes and nationalities; and shoreline structures such as lighthouses, lifesaving stations, canneries, dog-hole ports, whaling facilities, surfing, and boating.

STRATEGY XMHR-1: *Continue to build the Maritime Heritage Program.*

The ONMS is placing increasing emphasis on the development of maritime heritage resources programs to identify and protect submerged archaeological sites, and to increase public awareness about the maritime history associated with individual sanctuaries. A well-coordinated program will be required to identify and assess documented shipwrecks, some of which may pose significant environmental hazards; to protect sites from unauthorized disturbance; and to develop heritage partnerships and education programs.

Activity 1.1 Continue to identify potential maritime heritage partners and sources of funding.

Regional MHP staff should look for partners and funding opportunities to expand program into the expansion area.

STRATEGY XMHR-2: *Inventory and assess submerged sites.*

CBNMS, GFNMS, and MBNMS, in conjunction with the West Coast Regional Maritime Heritage Coordinator, will collaborate with state and federal agencies and the private sector to gather resource documentation and to create opportunities to locate and record submerged archaeological resources.

Activity 2.1 Inventory shipwrecks across the region.

Continue to establish external partnerships to inventory potential shipwreck sites with other federal, state, and local agencies as well as avocational archaeologists, commercial divers and fishermen, and recreational divers.

Activity 2.2 Conduct systematic research and surveys of archaeological sites, including the remains of prehistoric, as well as historic sites, representing ship and aircraft losses.

This effort would be focused on geographic regions with a high probability of cultural and historic remains established by conducting remote sensing surveys and/or diver investigations of target sites as part of larger research expeditions across the three sanctuaries. Such surveys would include the development of a research plan, education materials and curriculum, a project website, a site assessment report that include a comparison with previous surveys.

Activity 2.3 Establish a shipwreck reconnaissance and site monitoring program.

Use a model similar to that used at CINMS to record and monitor submerged sites and to document new artifact discoveries and evaluation of human site disturbance. Record site positions in NOAA's National Marine Sanctuary Archeological Site (ARCH) GIS database.

Activity 2.4 Assess and nominate appropriate submerged archaeological sites for inclusion in the National Register of Historic Places.

Regional MHP staff should look to contribute appropriate sites across the sanctuaries.

STRATEGY XMHR-3: *Assess shipwrecks and submerged structures for hazards.*

GFNMS and MBNMS, and possibly CBNMS, are faced with the challenge of identifying and monitoring historic and non-historic shipwrecks that may pose environmental threats to sanctuary marine resources. Information pertaining to shipwrecks as environmental threats is provided to NOAA's Emergency Response Division and the ONMS for the development of the SHIELDS and Remediation of Underwater Legacy Environmental Threats (RULET) database systems. The sanctuaries will develop a plan to address this issue since there are many shipwrecks that pose threats in the near future.

Activity 3.1 As needed, add to the inventory of shipwrecks, inside and outside of sanctuary boundaries, posing environmental threats to sanctuary marine resources.

This inventory is based upon primary and secondary source documentation from established shipwreck databases, interviews with commercial divers and fishermen, and recreational divers who frequently visit submerged shipwrecks. The sanctuaries will also collaborate with other organizations doing similar research. As the sanctuaries compile information regarding sites that may pose environmental threats, this information will be coordinated with NOAA's Emergency Response Division and the ONMS for the development of the SHIELDS and RULET database systems.

Activity 3.2 Monitor shipwreck sites.

Direct efforts to monitor sites that have been located and are considered a threat to sanctuary marine resources. Use protocols for site evaluation based on the monitoring work at such sites as the *Jacob Luckenbach* and the *Montebello*.

Activity 3.3 Coordinate with partners to reduce threats from shipwrecks.

GFNMS and MBNMS will continue to work with ONMS to identify shipwrecks that may pose environmental threats and will provide pertinent information to NOAA's Emergency Response Division and the ONMS for the inclusion in the SHIELDS and RULET GIS database systems. ONMS will work with other trustee agencies to develop a plan to monitor and prevent, reduce, and respond to environmental threats from any such vessels.

Activity 3.4 For historic shipwrecks, ensure compliance under Section 106 of the NHPA and the NMSA.

STRATEGY XMHR-4: *Protect and manage submerged archaeological resources.*

As part of the NEPA compliance process CBNMS, GFNMS and MBNMS are required to submit a review under Section 106 of the National Historic Preservation Act (NHPA) identifying historic and pre-historic archaeological properties and to take into account activities that may have an adverse or no adverse effect to these properties. Issues to be addressed by GFNMS, MBNMS, and possibly CBNMS, regarding the protection of submerged archaeological resources include:

- Permitting
- Site protection through enforcement and education
- Shipwrecks as environmental threats

Activity 4.1 Coordinate stewardship of submerged resources.

Jointly develop a uniform protocol to manage, monitor, and protect submerged sites within the three sanctuaries in partnership with appropriate local law enforcement agencies.

Activity 4.2 Provide training to sanctuary staff and facilitate training for partners.

The training will focus on the importance of submerged archaeological resources and the need and tools to manage and protect them and Section 106 requirements.

Activity 4.3 Identify archaeological and historic resources currently outside sanctuary boundaries that may be of significant historic interest or may pose a threat to sanctuary resources.

STRATEGY XMHR-5: *Conduct public outreach with traditional user and ocean-dependent groups and communities.*

A key aspect of the CBNMS, GFNMS, and MBNMS maritime heritage program will be to educate the public about traditional maritime cultures and practices including Native Americans; exploration; settlement; ethnic groups; whalers; dog-hole ports, historic and present-day fishermen; recreational uses; and traditional shipping, shipbuilding, canneries, and other economic activities reflecting historic human interaction with the ocean. Although sanctuary's maritime heritage protection status is given only to cultural and historical resources, the program recognizes that traditional user and ocean-dependent groups are interconnected with the sanctuaries and are an integral part of their history and cultural maritime landscape of the region. Therefore, this program will also acknowledge those traditional maritime heritage activities and practices consistent with the NMSA's primary goal of resource protection.

Activity 5.1 Identify traditional user and ocean-dependent groups.

Solicit and document the range of traditional user and ocean-dependent groups' ideas, values, etc. Conduct a literature search to gather resource documentation on traditional users and ocean-dependent groups and communities. Use this information to prioritize appropriate aspects of their maritime heritage.

Activity 5.2 Develop collaborative programs and initiatives.

GFNMS will initiate a partnership with the fishing community at Pillar Point Harbor to enhance relationships and jointly develop ways to educate the public on the interconnections with the three sanctuaries.

Activity 5.3 Create an inventory of historic and present maritime heritage communities.

Focus on traditionally associated people to support mapping, traditional place names, and interpretive programs. Assess and nominate appropriate sites for the National Register of Historic Places.

Activity 5.4 Map and document traditional communities and sites.

These communities and sites may include fishing and whaling sites; place names; shipping/commercial marine transport of passengers and cargo; lighthouses and life-saving stations; dog-hole ports; fort, tribes (coastal); and recreational uses such as surfing and diving.

STRATEGY XMHR-6: *Continue to provide maritime heritage-focused education and outreach programs.*

CBNMS, GFNMS and MBNMS's maritime cultural landscape of provides a unifying theme to educate and inform people along the California coast and throughout the country about the human interaction with the ocean. This involves understanding the broader context of specific

places that encompasses human activities that includes indigenous people of our nation's pre-historic and historic past as well as today's modern cultures and their sacred places; geography; paleontology; archaeology; traditional knowledge and sociocultural studies; oral traditions; commercial and recreational fisheries; recreation activities, maritime heritage resources such as lighthouses, piers, wharves, lifesaving stations, abandoned dog-hole ports and landings and working waterfronts, revealing the many human communities that overlap with marine environments in our national marine sanctuaries and contiguous waters. Through websites, museum exhibits, and other tools, the sanctuaries will continue to provide information on:

- Programs by and about traditional cultures and practices including Native Americans, ethnic groups, fishermen, and economic activities
- Shipwrecks, exploration, fishing and fisheries; trade vessels, routes and nationalities
- Shoreline structures such as lighthouses, life-saving stations, fort, canneries, dog-hole ports, and whaling facilities
- Traditional recreational activities such as diving, surfing, and boating
- Stewardship of our cultural and historic maritime resources

Activity 6.1 Improve information sharing and dialogue.

Hold an annual maritime heritage event to highlight specific cultural and historic resources that the sites are mandated to protect, such as archeological sites, shipwrecks, etc., and link to adjacent communities and human uses.

Activity 6.2 Create, expand and populate individual sanctuary websites and/or the West Coast Shipwreck Database.

The websites should include specific information about maritime heritage resources, such as living journals of traditional users and ocean-dependent groups as well as shipwreck survivors, archaeological project updates, potential environmental threats, and maps.

Activity 6.3 Develop and implement education and outreach programs and materials for the MHP.

Incorporate traditional users/ocean-dependent groups and submerged archaeological resources into existing and new education/outreach programs.

Activity 6.4 Collaborate on maritime heritage resource exhibits and signage.

The three sites will incorporate maritime heritage themes and messages as part of the California Statewide Signage, Exhibits, and Facilities plan.

TABLE XMHR-1: MEASURING PERFORMANCE OF THE CROSS-CUTTING MARITIME HERITAGE RESOURCES ACTION PLAN

Desired Outcome(s) For This Action Plan:	
Establish a well-coordinated joint maritime heritage program that identifies and assesses documented shipwrecks and associated environmental hazards; protects sites from unauthorized disturbance; and develops heritage partnerships and education programs.	
Performance Measures	Explanation
By Year 5, the Maritime Heritage program will identify and characterize all historical and cultural resources in these three sanctuaries in a Web database and, when appropriate, develop plans to protect these resources from threats. In the case of ships that pose a threat from oil spills, plans will be developed to mitigate harmful effects on natural resources.	The specific maritime heritage activities identified in this plan build upon existing site efforts and collectively establish a new joint maritime heritage program for this region. The program will allow these sites to be responsive to the NMSA mandate to identify and protect cultural and historic resources. Implementation of these strategies will better streamline and coordinate overall NMSP efforts to protect maritime heritage resources and expand awareness of the importance of these resources to the public.

KEY PARTNERS

CBNMS, GFNMS, MBNMS, CINMS, MAC, NOAA Emergency Response Division , NOAA Office of Response and Restoration, NOAA OLE, NPS, SHPO, California Sea Grant, CSLC, San Mateo County Harbor District – Pillar Point, and Half Moon Bay Fishermen’s Association, FMSA.



APPENDICES

CBNMS DRAFT MANAGEMENT PLAN

- I. Jurisdictional Authorities**
- II. Glossary**
- III. Acronyms**
- IV. National Marine Sanctuaries Act**
- V. Species List**

Appendix I: Jurisdictional Authorities

CBNMS is located entirely beyond the state tidelands and submerged lands (mean high tide to three nautical miles offshore) and is therefore under the jurisdiction of federal statutes with the exception that the CDFW exercises jurisdiction over certain fishing activities in CBNMS waters together with the NOAA, NMFS. The other federal agencies with existing primary responsibilities in the area of Cordell Bank are the USFWS and the BOEM and Bureau of Safety and Environmental Enforcement (BSEE) of the U.S. Department of the Interior, the USCG of the U.S. Department of Homeland Security, and the USEPA. This section will briefly review the responsibilities of these agencies.

FEDERAL AUTHORITIES

NMFS

The NMFS is responsible for enforcing the (MSFCMA, the MMPA, and the ESA. Under the MSFCMA, NMFS approves and enforces fishery management plans (FMP) prepared by regional fishery management councils. NMFS relies heavily on CDFW and USCG for enforcement operations both within and outside the territorial sea. Some of the CBNMS fish populations affected by FMP regulations are Lingcod, rockfish, and Salmon.

The NMFS shares responsibility with the FWS for implementation of the Marine Mammal Protection Act and the Endangered Species Act (see FWS entry below). NMFS is responsible for protecting cetaceans and pinnipeds and their habitats under both laws, as well as sea turtles and fish that are listed as threatened or endangered.

USFWS

Within the waters of CBNMS, the USFWS is responsible for protecting all marine mammal species other than cetaceans, as well as pinnipeds under the MMPA, and for protecting endangered or threatened bird species under the ESA. The Brown Pelican and Short-tailed Albatross are two bird species listed as endangered which forage in CBNMS.

USCG

The USCG, part of the U.S. Department of Homeland Security, has maritime security, safety and stewardship responsibilities, including investigation and law enforcement. It is also one of the five armed forces of the U.S. The scope of USCG jurisdiction includes environmental regulations, fisheries regulations (described under NMFS), pollution prevention and spill response regulations and policies, vessel traffic management, drug interdiction, and other maritime regulations (including vessel construction, design and operation).

Appendix I: Jurisdictional Authorities CBNMS Draft Management Plan

The USCG supports national marine sanctuary management by providing routine surveillance and dedicated law enforcement of the national marine sanctuaries concurrently with other USCG operations.

Beside enforcement of national marine sanctuary regulations, other important roles the USCG fulfills relevant to national marine sanctuary management are: enforcement of Clean Water Act (CWA) regulations to prevent pollution from vessel discharges of oil, hazardous substances, or other pollutants; coordination of Area Contingency Plans, serving as the federal on-scene coordinator during marine spill events; and coordinating search and rescue operations.

For ship traffic entering and exiting San Francisco Bay, the USCG has established a Vessel Traffic Separation Scheme (VTSS) in accordance with the Ports and Waterways Safety Act (PWSA). The VTSS consists of inbound and outbound vessel traffic lanes that are each one nm wide with a separation zone between them that is also one nautical mile wide. The northern traffic lanes extend into CBNMS, and vessels approaching San Francisco Bay from the north and departing in that direction pass through CBNMS.

BOEM and BSEE

The BOEM and BSEE are two agencies that were created after the Bureau of Ocean Energy Management, Regulation and Enforcement (formerly called the Minerals Management Service) was reorganized in 2011.

The BOEM is responsible for managing development of the nation's offshore resources in accordance with the provisions of the Outer Continental Shelf Lands Act (OCSLA). BOEM's functions include offshore leasing, resource evaluation, review and administration of oil and gas exploration and development plans, renewable energy development, National Environmental Policy Act (NEPA) analysis and environmental studies. The BSEE is responsible for safety and environmental oversight of offshore oil and gas operations, including permitting and inspections, of offshore oil and gas operations, in accordance with the OCSLA. BSEE's functions include the development and enforcement of safety and environmental regulations, permitting offshore exploration, development and production, inspections, offshore regulatory programs, oil spill response and training and environmental compliance programs.

The OCSLA establishes federal jurisdiction over all submerged lands under U.S. jurisdiction lying seaward of state coastal waters.

The Energy Policy Act of 2005, Section 388, granted the Secretary of the Interior authority to regulate alternative energy and alternate use on the OCS. Section 388 authority does not apply to areas within National Marine Sanctuaries.

EPA

The EPA has regulatory responsibilities with regard to ocean dumping. Title I of the Marine Protection, Research and Sanctuaries Act prohibits the transportation of any materials from the

United States for the purpose of dumping them into the territorial sea, the contiguous zone, and the ocean beyond without a permit from EPA.

STATE AUTHORITIES

CDFW

The CDFW, under the Fish and Game Code (and Chapter 14 of the Administrative Code), regulates and manages a wide variety of activities affecting the living marine resources generally out to three nautical miles from the California coast and in the EEZ. CDFW manages several fisheries that occur in state and federal waters including Dungeness crab and squid. A number of fisheries that occur in federal waters, including groundfish included in the federal Groundfish Fishery Management Plan A are under the joint jurisdiction of the state and the federal government.

Appendix II: Glossary of Terms

Action plan: A major section of a management plan contain related strategies and activities designed to address a specific issue or function (NOAA, *National Marine Sanctuary Management Plan Handbook*, 3rd edition, 2002).

Activity: Specific actions that will be taken to carry out a strategy (NOAA, *National Marine Sanctuary Management Plan Handbook*, 3rd edition, 2002).

Bathymetry: Water depth measurement information used to produce depth-contoured charts.

Benthic: The region of the ocean consisting of the seabed and the organisms that live on or in it.

Benthic communities: Bottom-dwelling plants and animals.

Biodiversity: The variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Continental shelf: A generally shallow, flat submerged portion of a continent, extending to the point of step descent to the ocean floor.

Critical habitat: The specific areas within the geographical area occupied by a threatened or endangered species on which are found those physical or biological features essential to the conservation of the species, and which may require special management considerations or protection.

Demersal: Fishes and other aquatic organisms that live near the bottom of the water column.

Depleted: A species is termed depleted when it falls below its optimum sustainable population.

Desired outcome: A succinct and concise statement that articulates a desired future for a sanctuary relative to a specific problem statement (NOAA, *National Marine Sanctuary Management Plan Handbook*, 3rd edition, 2002).

Ecology: The science of the relationships between organisms and their environments.

Ecosystem: The sum total of all living and nonliving components of a particular area that interact and exchange materials with each other; sometimes defined as the ecological community of organisms plus the environment with which they interact. Energy flow and nutrient cycling are regulated within a particular ecosystem and are studied as indicators of its overall health.

Endangered species: Any species that is in danger of extinction throughout all or a significant portion of its range.

Epifauna: Animals that live on the ocean bottom, either attached or moving freely over it.

Food chain: A succession of organisms in a community that constitutes a feeding chain in which food energy is transferred from one organism to another as each consumes a lower member and in turn is preyed upon by a higher member.

Indigenous: Living or occurring naturally in a specific area or environment.

Infaunal: Organisms that live buried in sediments, including a variety of polychaetes, burrowing crustaceans, and mollusks.

Infrastructure: Basic installations and facilities, such as roads, power plants, transportation, and communication systems.

Invertebrate: An animal lacking a backbone or spinal column.

Isobath: An imaginary line or one drawn on a map connecting all points of equal depth below the surface of a body of water.

Marine protected area: Any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein. (Executive Order 13158 on Marine Protected Areas). Under this broad definition, a wide variety of sites including fishery management zones, national parks, national marine sanctuaries, national estuarine research reserves, state conservation areas, critical habitats, and state reserves could be considered as marine protected areas.

Marine reserve: A kind of marine protected area generally agreed to have strict regulations regarding the extraction of resources.

Mollusks: Any of various members of the phylum Mollusca, largely marine invertebrates, including the edible shellfish and some 100,000 other species.

Multibeam: A type of sonar that has multiple beams to record water depth.

Organism: Plant or animal.

Pathogens: Any agent, most commonly a micro-organism, capable of causing a disease.

Pelagic: Of, relating to, or living in open seas or oceans rather than waters adjacent to land or inland waters.

Planktonic: Organisms dependent on water movement and currents as their means of transportation, including phytoplankton, zooplankton, and ichthyoplankton.

Program/Issue Statements: A one or two sentence articulation of the specific components of an issue (NOAA, *National Marine Sanctuary Management Plan Handbook*, 3rd edition, 2002).

Salinity: The relative concentration of salts, usually sodium chloride, in a given water sample. It is usually expressed in terms of the number of parts per thousand (ppt) or parts per million (ppm) of chlorine (Cl). As a reference, the salinity of seawater is approximately 35 ppt.

Side-scan sonar: A type of sonar that gathers sound reflections at oblique angles to the sensor.

Socioeconomic: Being both social and economic.

Strategy: The means by which a particular desired outcome can be achieved (NOAA, *National Marine Sanctuary Management Plan Handbook*, 3rd edition, 2002).

Substrate: A surface on which a plant or animal grows or is attached.

Terms of designation: A portion of the regulations for a given sanctuary that spells out its boundaries, regulations, and those activities potentially subject to future regulation.

Threatened Species: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Trawling: To fish using a trawl, a large tapered and flattened or conical net towed along the sea bottom.

Trolling: To fish by running a baited line behind a slowly moving boat.

Trophic: A description related to feeding; it often refers to a feeding level in a food chain.

Trophic level: One of a succession of steps in the movement of energy and matter through a food chain in an ecosystem.

Turbidity: The extent to which there are suspended or stirred up particles or sediments, as in the water column.

Appendix III: Acronyms

ACCEO	Alliance for California Current Ecosystem Observation
ACCESS	Applied California Current Ecosystem Studies
ACP	Area Contingency Plan
ACR	Audubon Canyon Ranch
ACS	American Cetacean Society
AIS	Automated Identification System
AOP	Annual Operating Plan
APPS	U.S. Act to Prevent Pollution from Ships
ARCH	National Marine Sanctuary Archeological Site GIS database
ATOC	Acoustic Thermometry of Ocean Climate
AUV	Autonomous Underwater Vehicle
Beach COMBERS	Beach Coastal Ocean/Marine Bird Education Research Surveys
BML	Bodega Marine Laboratory
BMP	best management practices
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CalCOFI	California Cooperative Oceanic Fisheries Investigations
CAS	California Academy of Sciences
CBNMS	Cordell Bank National Marine Sanctuary
CDFW	California Department of Fish and Wildlife
CeNCOOS	Central and Northern California Ocean Observing System
CFR	Code of Federal Regulations
CIMT	Center for Integrated Marine Technology
CINMS	Channel Islands National Marine Sanctuary
CMAR	Coastal Maritime Archaeology Resources
CMSF	Cordell Marine Sanctuary Foundation
COASST	Coastal Observation And Seabird Survey Team
CODAR	Coastal Ocean Dynamics Applications Radar
COSEE	Centers for Ocean Sciences Education
CSC	Coastal Services Center
CSLC	California State Lands Commission
CSUMB	California State University Monterey Bay
CWA	U.S. Clean Water Act
DARRF	Damage Assessment and Restoration Evolving Fund
DDT	Dichlorodiphenyltrichloroethane
DOC	U.S. Department of Commerce
DOI	U. S. Department of the Interior
EDS	Ecosystem Dynamics Study
EECOM	Environmental Education Council of Marin
EFH	essential fish habitat
EIR	Environmental Impact Report
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FEIS/MP	Final Environmental Impact Statement and Management Plan
FGBNMS	Flower Garden Banks National Marine Sanctuary

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FGC	California Fish and Game Commission
FGDC	Federal Geospatial Data Center
FMP	Fishery Management Plan
FMSA	Farallones Marine Sanctuary Association
FTE	Full Time Equivalent (full time federal employee)
FWCPA	Federal Water Pollution Control Act
GCEL	General Council Enforcement Litigation
GCOS	General Council Ocean Service
GFNMS	Gulf of the Farallones National Marine Sanctuary
GGNRA	Golden Gate National Recreation Area
GIS	geographic information system
GPS	global positioning system
GRNMS	Gray's Reef National Marine Sanctuary
GSA	General Services Administration
HAB	harmful algal bloom
HAZMAT	Hazardous Materials Response Division
HIHWNMS	Hawaiian Islands Humpback Whale National Marine Sanctuary
HMB	Half Moon Bay Regional Office
IACC	Interagency Coordinating Committee
ICES	International Council for Exploration of the Sea
ICS	Incident Command System
IFQ	individual fishing quota
IGERT	Integrative Graduate Education and Research Traineeship Program
IMO	International Maritime Organization
IOOS	Integrated Ocean Observing System
ITQ	individual transferable quota
IUCN	International Union for Conservation of Nature and Natural Resources
JASON	The JASON Project
JMPR	Joint Management Plan Review
JRAP	Joint Research Advisory Panel
LCV	Large Commercial Vessels
LiMPETS	Long-term Monitoring Program and Experiential Training for Students
LRA	List of Recommended Areas
MAC	Maritime Archeological Center
MARE	Marine Activities, Resources, and Education
MARINe	Multi-Agency Rocky Intertidal Network
MARPOL	International Convention for the Prevention of Pollution from Ships
MATE	Marine Advanced Technology Education Center
MBARI	Monterey Bay Aquarium Research Institute
MBNMS	Monterey Bay National Marine Sanctuary
MBSF	Monterey Bay & Channel Islands Sanctuary Foundation
MBTA	Migratory Bird Treaty Act
MERITO	Multicultural Education for Resource Issues Threatening Oceans
MHP	Marine Heritage Program
MLML	Moss Landing Marine Laboratories
MLPA	Marine Life Protection Act
MMPA	Marine Mammal Protection Act
MOA	memorandum of agreement

MOU	memorandum of understanding
MP	Management Plan
MPA	marine protected area
MSD	marine sanitation device
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NANPCA	Nonindigenous Aquatic Nuisance Prevention and Control Act
NAS	Nautical Archaeology Society
NCCOS	The National Centers for Coastal Ocean Science
NDBC	National Data Buoy Center
NEPA	National Environmental Policy Act
NERRS	National Estuarine Research Reserve System
NESDIS	National Environmental Satellite Data Information Service
NGO	non-governmental organization
NGS	National Geographic Society
NHPA	National Historic Preservation Act
NISA	National Invasive Species Act of 1996
NISAC	Non-native Invasive Species Advisory Committee
NM	nautical mile
NMA	Northern Management Area
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NMSF	National Marine Sanctuary Foundation
NOAA	National Oceanic and Atmospheric Administration
NOAA OLE	NOAA Office of Law Enforcement
NODC	National Oceanographic Data Center
NOS	National Ocean Service
NPDES	National Pollutant Discharge Elimination System
NPR	National Public Radio
NPS	National Park Service
NRDA	National Resource Damage Assessment and Restoration
NURP	National Undersea Research Program
NWFSC	North West Fisheries Science Center
NWS	National Weather Service
OCNMS	Olympic Coast National Marine Sanctuary
OCRM	Office of Ocean and Coastal Resource Management
OCS	Outer Continental Shelf
OES	Office of Emergency Services
ONMS	Office of National Marine Sanctuaries
OPA	Oil Spill Prevention Act of 1990
ORR	Office of Response and Restoration
OSPR	Office of Spill Prevention and Response
OSRO	Oil Spill Response Organization
PCFFA	Pacific Coast Federation of Fishermen's Associations
PCLC	Pacific Coast Learning Center
PFMC	Pacific Fishery Management Council
PISCO	Partnership for Interdisciplinary Studies of Coastal Oceans
PRCS	Point Reyes Conservation Science
PRNS	Point Reyes National Seashore

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PRNSA	Point Reyes National Seashore Association
PSA	public service announcement
PSMFC	Pacific States Marine Fisheries Commission
PWSA	Ports and Waterways Safety Act
RAP	Research Advisory Panel
ROV	remotely operated vehicle
RRP	Regional Response Plan
RUST	Resources and Under Sea Threats
SBNMS	Stellwagen Bank National Marine Sanctuary
SCCWRP	Southern California Coastal Water Research Project Authority
SCRP	Submerged Cultural Resources Program
SEAMAP	Southeast Area Monitoring and Assessment Program
SeaWif	Sea-viewing Wide Field of Vision
SERC	Smithsonian Environmental Research Center
SFBNERR	San Francisco Bay National Estuarine Research Reserve
SFSU	San Francisco State University
SHIELDS	Sanctuaries Hazardous Incident Emergency Logistics Database System
SHPO	California State Historic Preservation Office
SIMoN	Sanctuary Integrated Monitoring Network
SRP	Shipwreck Reconnaissance Program
SWiM	System Wide Monitoring Program
SWMEA	Southwest Marine and Aquatic Educator's Association
TBNMS	Thunder Bay National Marine Sanctuary
Team OCEAN	TEAM Ocean Conservation Education Action Network
TMMC	The Marine Mammal Center
UCD	University of California Davis
UCSC	University of California Santa Cruz
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VTS	Vessel Traffic System
VTSS	Vessel Traffic Separation Schemes
WCRO	West Coast Regional Office
WQPP	Water Quality Protection Program

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16 U.S.C. 1431 ET SEQ., as amended by Public Law 106-513

Sec. 301. FINDINGS, PURPOSES, AND POLICIES; ESTABLISHMENT OF SYSTEM

(a) FINDINGS.--The Congress finds that--

(1) this Nation historically has recognized the importance of protecting special areas of its public domain, but these efforts have been directed almost exclusively to land areas above the high-water mark;

(2) certain areas of the marine environment possess conservation, recreational, ecological, historical, scientific, educational, cultural, archeological, or aesthetic qualities which give them special national, and in some instances, international, significance;

(3) while the need to control the effects of particular activities has led to enactment of resource-specific legislation, these laws cannot in all cases provide a coordinated and comprehensive approach to the conservation and management of special areas of the marine environment; and

(4) a Federal program which establishes areas of the marine environment which have special conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, or aesthetic qualities as national marine sanctuaries managed as the National Marine Sanctuary System will--

(A) improve the conservation, understanding, management, and wise and sustainable use of marine resources;

(B) enhance public awareness, understanding, and appreciation of the marine environment; and

(C) maintain for future generations the habitat, and ecological services, of the natural assemblage of living resources that inhabit these areas.

(b) PURPOSES AND POLICIES.--The purposes and policies of this title are--

(1) to identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System;

(2) to provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;

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(3) to maintain the natural biological communities in the national marine sanctuaries, and to protect, and, where appropriate, restore and enhance natural habitats, populations, and ecological processes;

(4) to enhance public awareness, understanding, appreciation, and wise and sustainable use of the marine environment, and the natural, historical, cultural, and archeological resources of the National Marine Sanctuary System;

(5) to support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas;

(6) to facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities;

(7) to develop and implement coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations, international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;

(8) to create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques; and

(9) to cooperate with global programs encouraging conservation of marine resources.

(c) ESTABLISHMENT OF SYSTEM.-There is established the National Marine Sanctuary System, which shall consist of national marine sanctuaries designated by the Secretary in accordance with this title.

Sec. 302. DEFINITIONS

As used in this title, the term--

(1) "management plan" means the plan described in section 304(a)(1)(C)(v);

(2) "Magnuson-Stevens Act" means the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.);

(3) "marine environment" means those areas of coastal and ocean waters, the Great Lakes and their connecting waters, and submerged lands over which the United States exercises jurisdiction, including the exclusive economic zone, consistent with international law;

(4) "Secretary" means the Secretary of Commerce;

(5) "State" means each of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, the Virgin Islands, Guam, and any other commonwealth, territory, or possession of the United States;

(6) "damages" includes--

(A) compensation for--

(i)(I) the cost of replacing, restoring, or acquiring the equivalent of a sanctuary resource; and (II) the value of the lost use of a sanctuary resource pending its restoration or replacement or the acquisition of an equivalent sanctuary resource; or

(ii) the value of a sanctuary resource if the sanctuary resource cannot be restored or replaced or if the equivalent of such resource cannot be acquired;

(B) the cost of damage assessments under section 312(b)(2);

(C) the reasonable cost of monitoring appropriate to the injured, restored, or replaced resources;

(D) the cost of curation and conservation of archeological, historical, and cultural sanctuary resources; and

(E) the cost of enforcement actions undertaken by the Secretary in response to the destruction or loss of, or injury to, a sanctuary resource;

(7) "response costs" means the costs of actions taken or authorized by the Secretary to minimize destruction or loss of, or injury to, sanctuary resources, or to minimize the imminent risks of such destruction, loss, or injury, including costs related to seizure forfeiture, storage, or disposal arising from liability under section 312;

(8) "sanctuary resource" means any living or nonliving resource of a national marine sanctuary that contributes to the conservation, recreational, ecological, historical, educational, cultural, archeological, scientific, or aesthetic value of the sanctuary;

(9) "exclusive economic zone" means the exclusive economic zone as defined in the Magnuson-Stevens Act; and

(10) 'System' means the National Marine Sanctuary System established by section 301.

Sec. 303. SANCTUARY DESIGNATION STANDARDS

(a) STANDARDS.--The Secretary may designate any discrete area of the marine environment as a national marine sanctuary and promulgate regulations implementing the designation if the Secretary determines that--

(1) the designation will fulfill the purposes and policies of this title;

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(2) the area is of special national significance due to-

(A) its conservation, recreational, ecological, historical, scientific, cultural, archeological, educational, or aesthetic qualities;

(B) the communities of living marine resources it harbors; or

(C) its resource or human-use values;

(3) existing State and Federal authorities are inadequate or should be supplemented to ensure coordinated and comprehensive conservation and management of the area, including resource protection, scientific research, and public education;

(4) designation of the area as a national marine sanctuary will facilitate the objectives in subparagraph (3); and

(5) the area is of a size and nature that will permit comprehensive and coordinated conservation and management.

(b) FACTORS AND CONSULTATIONS REQUIRED IN MAKING DETERMINATIONS AND FINDINGS.--

(1) Factors.--For purposes of determining if an area of the marine environment meets the standards set forth in subsection (a), the Secretary shall consider--

(A) the area's natural resource and ecological qualities, including its contribution to biological productivity, maintenance of ecosystem structure, maintenance of ecologically or commercially important or threatened species or species assemblages, maintenance of critical habitat of endangered species, and the biogeographic representation of the site;

(B) the area's historical, cultural, archaeological, or paleontological significance;

(C) the present and potential uses of the area that depend on maintenance of the area's resources, including commercial and recreational fishing, subsistence uses other than commercial and recreational activities, and research and education;

(D) the present and potential activities that may adversely affect the factors identified in subparagraphs (A), (B), (C);

(E) the existing State and Federal regulatory and management authorities applicable to the area and the adequacy of those authorities to fulfill the purposes and policies of this title;

(F) the manageability of the area, including such factors as its size, its ability to be identified as a discrete ecological unit with definable boundaries, its accessibility, and its suitability for monitoring and enforcement activities;

(G) the public benefits to be derived from sanctuary status, with emphasis on the benefits of long-term protection of nationally significant resources, vital habitats, and resources which generate tourism;

(H) the negative impacts produced by management restrictions on income-generating activities such as living and nonliving resources development;

(I) the socioeconomic effects of sanctuary designation;

(J) the area's scientific value and value for monitoring the resources and natural processes that occur there;

(K) the feasibility, where appropriate, of employing innovative management approaches to protect sanctuary resources or to manage compatible uses; and

(L) the value of the area as an addition to the System.

(2) Consultation.--In making determinations and findings, the Secretary shall consult with--

(A) the Committee on Resources of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate;

(B) the Secretaries of State, Defense, Transportation, and the Interior, the Administrator, and the heads of other interested Federal agencies;

(C) the responsible officials or relevant agency heads of the appropriate State and local government entities, including coastal zone management agencies, that will or are likely to be affected by the establishment of the area as a national marine sanctuary;

(D) the appropriate officials of any Regional Fishery Management Council established by section 302 of the Magnuson-Stevens Act (16 U.S.C. 1852) that may be affected by the proposed designation; and

(E) other interested persons.

Sec. 304. PROCEDURES FOR DESIGNATION AND IMPLEMENTATION

(a) SANCTUARY PROPOSAL.--

(1) Notice.--In proposing to designate a national marine sanctuary, the Secretary shall--

(A) issue, in the Federal Register, a notice of the proposal, proposed regulations that may be necessary and reasonable to implement the proposal, and a summary of the management plan;

(B) provide notice of the proposal in newspapers of general circulation or electronic media in the communities that may be affected by the proposal; and

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(C) no later than the day on which the notice required under subparagraph (A) is submitted to Office of the Federal Register, submit a copy of that notice and the sanctuary designation documents prepared pursuant to section 304(a)(2), including an executive summary, to the Committee on Resources of the House of Representatives, the Committee on Commerce, Science, and Transportation of the Senate, and the Governor of each State in which any part of the proposed sanctuary would be located.

(2) Sanctuary Designation Documents.--The Secretary shall prepare and make available to the public sanctuary designation documents on the proposal that include the following:

(A) A environmental impact statement pursuant to the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.).

(B) A resource assessment that documents--

(i) present and potential uses of the area, including commercial and recreational fishing, research and education, minerals and energy development, subsistence uses, and other commercial, governmental, or recreational uses;

(ii) after consultation with the Secretary of the Interior, any commercial, governmental, or recreational resource uses in the areas that are subject to the primary jurisdiction of the Department of the Interior; and

(iii) information prepared in consultation with the Secretary of Defense, the Secretary of Energy, and the Administrator of the Environmental Protection Agency, on any past, present, or proposed future disposal or discharge of materials in the vicinity of the proposed sanctuary. Public disclosure by the Secretary of such information shall be consistent with national security regulations.

(C) A management plan for the proposed national marine sanctuary that includes the following:

(i) The terms of the proposed designation.

(ii) Proposed mechanisms to coordinate existing regulatory and management authorities within the area.

(iii) The proposed goals and objectives, management responsibilities, resource studies, and appropriate strategies for managing sanctuary resources of the proposed sanctuary, including interpretation and education, innovative management strategies, research, monitoring and assessment, resource protection, restoration, enforcement, and surveillance activities.

(iv) An evaluation of the advantages of cooperative State and Federal management if all or part of the proposed sanctuary is within the territorial limits of any State or is superjacent to the subsoil and seabed within the seaward boundary of a State, as that boundary is established under the Submerged Lands Act (43 U.S.C. 1301 et seq.).

(v) An estimate of the annual cost to the Federal Government of the proposed designation, including costs of personnel, equipment and facilities, enforcement, research, and public education.

(vi) The proposed regulations referred to in paragraph (1)(A).

(D) Maps depicting the boundaries of the proposed sanctuary.

(E) The basis for the determinations made under section 303(a) with respect to the area.

(F) An assessment of the considerations under section 303(b)(1).

(3) Public Hearing.--No sooner than thirty days after issuing a notice under this subsection, the Secretary shall hold at least one public hearing in the coastal area or areas that will be most affected by the proposed designation of the area as a national marine sanctuary for the purpose of receiving the views of interested parties.

(4) Terms of Designation.--The terms of designation of a sanctuary shall include the geographic area proposed to be included within the sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or aesthetic value, and the types of activities that will be subject to regulation by the Secretary to protect those characteristics. The terms of designation may be modified only by the same procedures by which the original designation is made.

(5) Fishing Regulations.--The Secretary shall provide the appropriate Regional Fishery Management Council with the opportunity to prepare regulations for fishing within the Exclusive Economic Zone as the Council may deem necessary to implement the proposed designation. Draft regulations prepared by the Council, or a Council determination that regulations are not necessary pursuant to this paragraph, shall be accepted and issued as proposed regulations by the Secretary unless the Secretary finds that the Council's action fails to fulfill the purposes and policies of this title and the goals and objectives of the proposed designation. In preparing the regulations, a Regional Fishery Management Council shall use as guidance the national standards of section 301(a) of the Magnuson-Stevens Act (16 U.S.C. 1851) to the extent that the standards are consistent and compatible with the goals and objectives of the proposed designation. The Secretary shall prepare the fishing regulations, if the Council declines to make a determination with respect to the need for regulations, makes a determination which is rejected by the Secretary, or fails to prepare the regulations in a timely manner. Any amendments to the fishing regulations shall be drafted, approved, and issued in the same manner as the original regulations. The Secretary shall also cooperate with other appropriate fishery management authorities with rights or responsibilities within a proposed sanctuary at the earliest practicable stage in drafting any sanctuary fishing regulations.

(6) Committee Action.--After receiving the documents under subsection (a)(1)(C), the Committee on Resources of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate may each hold hearings on the proposed designation and on the

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matters set forth in the documents. If within the forty-five day period of continuous session of Congress beginning on the date of submission of the documents, either Committee issues a report concerning matters addressed in the documents, the Secretary shall consider this report before publishing a notice to designate the national marine sanctuary.

(b) TAKING EFFECT OF DESIGNATIONS.--

(1) Notice.--In designating a national marine sanctuary, the Secretary shall publish in the Federal Register notice of the designation together with final regulations to implement the designation and any other matters required by law, and submit such notice to the Congress. The Secretary shall advise the public of the availability of the final management plan and the final environmental impact statement with respect to such sanctuary. The Secretary shall issue a notice of designation with respect to a proposed national marine sanctuary site not later than 30 months after the date a notice declaring the site to be an active candidate for sanctuary designation is published in the Federal Register under regulations issued under this Act, or shall publish not later than such date in the Federal Register findings regarding why such notice has not been published. No notice of designation may occur until the expiration of the period for Committee action under subsection (a)(6). The designation (and any of its terms not disapproved under this subsection) and regulations shall take effect and become final after the close of a review period of forty-five days of continuous session of Congress beginning on the day on which such notice is published unless in the case of a natural [sic] marine sanctuary that is located partially or entirely within the seaward boundary of any State, the Governor affected certifies to the Secretary that the designation or any of its terms is unacceptable, in which case the designation or the unacceptable term shall not take effect in the area of the sanctuary lying within the seaward boundary of the State.

(2) Withdrawal of Designation.-- If the Secretary considers that actions taken under paragraph (1) will affect the designation of a national marine sanctuary in a manner that the goals and objectives of the sanctuary or System cannot be fulfilled, the Secretary may withdraw the entire designation. If the Secretary does not withdraw the designation, only those terms of the designation or not certified under paragraph (1) shall take effect.

(3) Procedures.-- In computing the forty-five-day periods of continuous session of Congress pursuant to subsection (a)(6) and paragraph (1) of this subsection--

(A) continuity of session is broken only by an adjournment of Congress sine die; and

(B) the days on which either House of Congress is not in session because of an adjournment of more than three days to a day certain are excluded.

(c) ACCESS AND VALID RIGHTS.--

(1) Nothing in this title shall be construed as terminating or granting to the Secretary the right to terminate any valid lease, permit, license, or right of subsistence use or of access that is in existence on the date of designation of any national marine sanctuary.

(2) The exercise of a lease, permit, license, or right is subject to regulation by the Secretary consistent with the purposes for which the sanctuary is designated.

(d) INTERAGENCY COOPERATION.--

(1) Review of Agency Actions.--

(A) In General.--Federal agency actions internal or external to a national marine sanctuary, including private activities authorized by licenses, leases, or permits, that are likely to destroy, cause the loss of, or injure any sanctuary resource are subject to consultation with the Secretary.

(B) Agency Statements Required.-- Subject to any regulations the Secretary may establish each Federal agency proposing an action described in subparagraph (A) shall provide the Secretary with a written statement describing the action and its potential effects on sanctuary resources at the earliest practicable time, but in no case later than 45 days before the final approval of the action unless such Federal agency and the Secretary agree to a different schedule.

(2) Secretary's Recommended Alternatives.--If the Secretary finds that a Federal agency action is likely to destroy, cause the loss of, or injure a sanctuary resource, the Secretary shall (within 45 days of receipt of complete information on the proposed agency action) recommend reasonable and prudent alternatives, which may include conduct of the action elsewhere, which can be taken by the Federal agency in implementing the agency action that will protect sanctuary resources.

(3) Response to Recommendations.--The agency head who receives the Secretary's recommended alternatives under paragraph (2) shall promptly consult with the Secretary on the alternatives. If the agency head decides not to follow the alternatives, the agency head shall provide the Secretary with a written statement explaining the reasons for that decision.

(4) FAILURE TO FOLLOW ALTERNATIVE.--If the head of a Federal agency takes an action other than an alternative recommended by the Secretary and such action results in the destruction of, loss of, or injury to a sanctuary resource, the head of the agency shall promptly prevent and mitigate further damage and restore or replace the sanctuary resource in a manner approved by the Secretary.

(e) REVIEW OF MANAGEMENT PLANS.--Not more than 5 years after the date of designation of any national marine sanctuary, and thereafter at intervals not exceeding 5 years, the Secretary shall evaluate the substantive progress toward implementing the management plan and goals for the sanctuary, especially the effectiveness of site-specific management techniques and strategies, and shall revise the management plan and regulations as necessary to fulfill the purposes and policies of this title. This review shall include a prioritization of management objectives.

(f) LIMITATION ON DESIGNATION OF NEW SANCTUARIES.--

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(1) FINDING REQUIRED.--The Secretary may not publish in the Federal Register any sanctuary designation notice or regulations proposing to designate a new sanctuary, unless the Secretary has published a finding that--

(A) the addition of a new sanctuary will not have a negative impact on the System; and

(B) sufficient resources were available in the fiscal year in which the finding is made to--

(i) effectively implement sanctuary management plans for each sanctuary in the System; and

(ii) complete site characterization studies and inventory known sanctuary resources, including cultural resources, for each sanctuary in the System within 10 years after the date that the finding is made if the resources available for those activities are maintained at the same level for each fiscal year in that 10 year period.

(2) DEADLINE.--If the Secretary does not submit the findings required by paragraph (1) before February 1, 2004, the Secretary shall submit to the Congress before October 1, 2004, a finding with respect to whether the requirements of subparagraphs (A) and (B) of paragraph 1 have been met by all existing sanctuaries.

(3) LIMITATION ON APPLICATION.--Paragraph (1) does not apply to any sanctuary designation documents for--

(A) a Thunder Bay National Marine Sanctuary; or

(B) a Northwestern Hawaiian Islands National Marine Sanctuary.

(g) NORTHWESTERN HAWAIIAN ISLANDS CORAL REEF RESERVE.--

(1) PRESIDENTIAL DESIGNATION.--The President, after consultation with the Governor of the State of Hawaii, may designate any Northwestern Hawaiian Islands coral reef or coral reef ecosystem as a coral reef reserve to be managed by the Secretary of Commerce.

(2) SECRETARIAL ACTION.--Upon the designation of a reserve under paragraph (1) by the President, the Secretary shall--

(A) take action to initiate the designation of the reserve as a National Marine Sanctuary under sections 303 and 304 of the National Marine Sanctuaries Act (16 U.S.C. 1433);

(B) establish a Northwestern Hawaiian Islands Reserve Advisory Council under section 315 of that Act (16 U.S.C. 1445a), the membership of which shall include at least 1 representative from Native Hawaiian groups; and

(C) until the reserve is designated as a National Marine Sanctuary, manage the reserve in a manner consistent with the purposes and policies of that Act.

(3) PUBLIC COMMENT.--Notwithstanding any other provision of law, no closure areas around the Northwestern Hawaiian Islands shall become permanent without adequate review and comment.

(4) COORDINATION.--The Secretary shall work with other Federal agencies and the Director of the National Science Foundation, to develop a coordinated plan to make vessels and other resources available for conservation or research activities for the reserve.

(5) REVIEW.--If the Secretary has not designated a national marine sanctuary in the Northwestern Hawaiian Islands under sections 303 and 304 of the National Marine Sanctuaries Act (16 U.S.C. 1433, 1434) before October 1, 2005, the Secretary shall conduct a review of the management of the reserve under section 304(e) of that Act (16 U.S.C. 1434(e)).

(6) REPORT.--No later than 6 months after the date of enactment of this Act, the Secretary shall submit a report to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Resources, describing actions taken to implement this subsection, including costs of monitoring, enforcing, and addressing marine debris, and the extent to which the fiscal or other resources necessary to carry out this subsection are reflected in the Budget of the United States Government submitted by the President under section 1104 of title 31, United States Code.

(7) AUTHORIZATION OF APPROPRIATIONS.--There are authorized to be appropriated to the Secretary of Commerce to carry out the provisions of this subsection such sums, not exceeding \$4,000,000 for each of fiscal years 2001, 2002, 2003, 2004, and 2005, as are reported under paragraph (6) to be reflected in the Budget of the United States Government.

Sec. 305. APPLICATION OF REGULATIONS AND INTERNATIONAL NEGOTIATIONS

(a) REGULATIONS.--This title and the regulations issued under section 304 shall be applied in accordance with generally recognized principles of international law, and in accordance with the treaties, conventions, and other agreements to which the United States is a party. No regulation shall apply to or be enforced against a person who is not a citizen, national, or resident alien of the United States, unless in accordance with--

- (1) generally recognized principles of international law;
- (2) an agreement between the United States and the foreign state of which the person is a citizen; or
- (3) an agreement between the United States and the flag state of a foreign vessel, if the person is a crewmember of the vessel.

(b) NEGOTIATIONS.--The Secretary of State, in consultation with the Secretary, shall take appropriate action to enter into negotiations with other governments to make necessary

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arrangements for the protection of any national marine sanctuary and to promote the purposes for which the sanctuary is established.

(c) INTERNATIONAL COOPERATION.--The Secretary, in consultation with the Secretary of State and other appropriate Federal agencies, shall cooperate with other governments and international organizations in the furtherance of the purposes and policies of this title and consistent with applicable regional and multilateral arrangements for the protection and management of special marine areas.

Sec. 306. PROHIBITED ACTIVITIES

It is unlawful for any person to--

(1) destroy, cause the loss of, or injure any sanctuary resource managed under law or regulations for that sanctuary;

(2) possess, sell, offer for sale, purchase, import, export, deliver, carry, transport, or ship by any means any sanctuary resource taken in violation of this section;

(3) interfere with the enforcement of this title by--

(A) refusing to permit any officer authorized to enforce this title to board a vessel, other than a vessel operated by the Department of Defense or United States Coast Guard, subject to such person's control for the purposes of conducting any search or inspection in connection with the enforcement of this title;

(B) resisting, opposing, impeding, intimidating, harassing, bribing, interfering with, or forcibly assaulting any person authorized by the Secretary to implement this title or any such authorized officer in the conduct of any search or inspection performed under this title; or

(C) knowingly and willfully submitting false information to the Secretary or any officer authorized to enforce this title in connection with any search or inspection conducted under this title; or

(4) violate any provision of this title or any regulation or permit issued pursuant to this title.

Sec. 307. ENFORCEMENT

(a) IN GENERAL.--The Secretary shall conduct such enforcement activities as are necessary and reasonable to carry out this title.

(b) POWERS OF AUTHORIZED OFFICERS.--Any person who is authorized to enforce this title may--

(1) board, search, inspect, and seize any vessel suspected of being used to violate this title or any regulation or permit issued under this title and any equipment, stores, and cargo of such vessel;

(2) seize wherever found any sanctuary resource taken or retained in violation of this title or any regulation or permit issued under this title;

(3) seize any evidence of a violation of this title or of any regulation or permit issued under this title;

(4) execute any warrant or other process issued by any court of competent jurisdiction;

(5) exercise any other lawful authority; and

(6) arrest any person, if there is reasonable cause to believe that such a person has committed an act prohibited by section 306(3).

(c) CRIMINAL OFFENSES.--

(1) OFFENSES.--A person is guilty of an offense under this subsection if the person commits any act prohibited by section 306(3).

(2) PUNISHMENT.--Any person that is guilty of an offense under this subsection--

(A) except as provided in subparagraph (B), shall be fined under title 18, United States Code, imprisoned for not more than 6 months, or both; or

(B) in the case of a person who in the commission of such an offense uses a dangerous weapon, engages in conduct that causes bodily injury to any person authorized to enforce this title or any person authorized to implement the provisions of this title, or places any such person in fear of imminent bodily injury, shall be fined under title 18, United States Code, imprisoned for not more than 10 years, or both.

(d) CIVIL PENALTIES.--

(1) Civil penalty.--Any person subject to the jurisdiction of the United States who violates this title or any regulation or permit issued under this title shall be liable to the United States for a civil penalty of not more than \$100,000 for each such violation, to be assessed by the Secretary. Each day of a continuing violation shall constitute a separate violation.

(2) Notice.--No penalty shall be assessed under this subsection until after the person charged has been given notice and an opportunity for a hearing.

(3) In Rem Jurisdiction.--A vessel used in violating this title or any regulation or permit issued under this title shall be liable in rem for any civil penalty assessed for such violation. Such penalty shall constitute a maritime lien on the vessel and may be recovered in an action in rem in the district court of the United States having jurisdiction over the vessel.

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(4) Review of Civil Penalty.--Any person against whom a civil penalty is assessed under this subsection may obtain review in the United States district court for the appropriate district by filing a complaint in such court not later than 30 days after the date of such order.

(5) Collection of Penalties.--If any person fails to pay an assessment of a civil penalty under this section after it has become a final and unappealable order, or after the appropriate court has entered final judgment in favor of the Secretary, the Secretary shall refer the matter to the Attorney General, who shall recover the amount assessed in any appropriate district court of the United States. In such action, the validity and appropriateness of the final order imposing the civil penalty shall not be subject to review.

(6) Compromise or Other Action by Secretary.--The Secretary may compromise, modify, or remit, with or without conditions, any civil penalty which is or may be imposed under this section.

(e) FORFEITURE.--

(1) In General.--Any vessel (including the vessel's equipment, stores, and cargo) and other item used, and any sanctuary resource taken or retained, in any manner, in connection with or as a result of any violation of this title or of any regulation or permit issued under this title shall be subject to forfeiture to the United States pursuant to a civil proceeding under this subsection. The proceeds from forfeiture actions under this subsection shall constitute a separate recovery in addition to any amounts recovered as civil penalties under this section or as civil damages under section 312. None of those proceeds shall be subject to set-off.

(2) Application of the Customs Laws.--The Secretary may exercise the authority of any United States official granted by any relevant customs law relating to the seizure, forfeiture, condemnation, disposition, remission, and mitigation of property in enforcing this title.

(3) Disposal of Sanctuary Resources.--Any sanctuary resource seized pursuant to this title may be disposed of pursuant to an order of the appropriate court or, if perishable, in a manner prescribed by regulations promulgated by the Secretary. Any proceeds from the sale of such sanctuary resource shall for all purposes represent the sanctuary resource so disposed of in any subsequent legal proceedings.

(4) Presumption.--For the purposes of this section there is a rebuttable presumption that all sanctuary resources found on board a vessel that is used or seized in connection with a violation of this title or of any regulation or permit issued under this title were taken or retained in violation of this title or of a regulation or permit issued under this title.

(f) PAYMENT OF STORAGE, CARE, AND OTHER COSTS.--

(1) Expenditures.--

(A) Notwithstanding any other law, amounts received by the United States as civil penalties, forfeitures of property, and costs imposed under paragraph (2) shall be retained by the Secretary in the manner provided for in section 107(f)(1) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

(B) Amounts received under this section for forfeitures and costs imposed under paragraph (2) shall be used to pay the reasonable and necessary costs incurred by the Secretary to provide temporary storage, care, maintenance, and disposal of any sanctuary resource or other property seized in connection with a violation of this title or any regulation or permit issued under this title.

(C) Amounts received under this section as civil penalties and any amounts remaining after the operation of subparagraph (B) shall be used, in order of priority, to--

(i) manage and improve the national marine sanctuary with respect to which the violation occurred that resulted in the penalty or forfeiture;

(ii) pay a reward to any person who furnishes information leading to an assessment of a civil penalty, or to a forfeiture of property, for a violation of this title or any regulation or permit issued under this title; and

(iii) manage and improve any other national marine sanctuary.

(2) **Liability for Costs.**--Any person assessed a civil penalty for a violation of this title or of any regulation or permit issued under this title, and any claimant in a forfeiture action brought for such a violation, shall be liable for the reasonable costs incurred by the Secretary in storage, care, and maintenance of any sanctuary resource or other property seized in connection with the violation.

(g) **SUBPOENAS.**--In the case of any hearing under this section which is determined on the record in accordance with the procedures provided for under section 554 of title 5, United States Code, the Secretary may issue subpoenas for the attendance and testimony of witnesses and the production of relevant papers, books, electronic files, and documents, and may administer oaths.

(h) **USE OF RESOURCES OF STATE AND OTHER FEDERAL AGENCIES.**—The Secretary shall, whenever appropriate, use by agreement the personnel, services, and facilities of State and other Federal departments, agencies, and instrumentalities, on a reimbursable or nonreimbursable basis, to carry out the Secretary's responsibilities under this section.

(i) **COAST GUARD AUTHORITY NOT LIMITED.**--Nothing in this section shall be considered to limit the authority of the Coast Guard to enforce this or any other Federal law under section 89 of title 14, United States Code.

(j) **INJUNCTIVE RELIEF.**--If the Secretary determines that there is an imminent risk of destruction or loss of or injury to a sanctuary resource, or that there has been actual destruction

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or loss of, or injury to, a sanctuary resource which may give rise to liability under section 312, the Attorney General, upon request of the Secretary, shall seek to obtain such relief as may be necessary to abate such risk or actual destruction, loss, or injury, or to restore or replace the sanctuary resource, or both. The district courts of the United States shall have jurisdiction in such a case to order such relief as the public interest and the equities of the case may require.

(k) AREA OF APPLICATION AND ENFORCEABILITY.--The area of application and enforceability of this title includes the territorial sea of the United States, as described in Presidential Proclamation 5928 of December 27, 1988, which is subject to the sovereignty of the United States, and the United States exclusive economic zone, consistent with international law.

(l) NATIONWIDE SERVICE OF PROCESS.- In any action by the United States under this title, process may be served in any district where the defendant is found, resides, transacts business, or has appointed an agent for the service of process.

Sec. 308. REGULATIONS

The Secretary may issue such regulations as may be necessary to carry out this title.

Sec. 309. RESEARCH, MONITORING, AND EDUCATION

(a) IN GENERAL- The Secretary shall conduct, support, or coordinate research, monitoring, evaluation, and education programs consistent with subsections (b) and (c) and the purposes and policies of this title.

(b) RESEARCH AND MONITORING.-

(1) IN GENERAL.- The Secretary may--

(A) support, promote, and coordinate research on, and long-term monitoring of, sanctuary resources and natural processes that occur in national marine sanctuaries, including exploration, mapping, and environmental and socioeconomic assessment;

(B) develop and test methods to enhance degraded habitats or restore damaged, injured, or lost sanctuary resources; and

(C) support, promote, and coordinate research on, and the conservation, curation, and public display of, the cultural, archeological, and historical resources of national marine sanctuaries.

(2) AVAILABILITY OF RESULTS.- The results of research and monitoring conducted, supported, or permitted by the Secretary under this subsection shall be made available to the public.

(c) EDUCATION-

(1) IN GENERAL.- The Secretary may support, promote, and coordinate efforts to enhance public awareness, understanding, and appreciation of national marine sanctuaries and the System. Efforts supported, promoted, or coordinated under this subsection must emphasize the conservation goals and sustainable public uses of national marine sanctuaries and the System.

(2) EDUCATIONAL ACTIVITIES.- Activities under this subsection may include education of the general public, teachers, students, national marine sanctuary users, and ocean and coastal resource managers.

(d) INTERPRETIVE FACILITIES.-

(1) IN GENERAL.- The Secretary may develop interpretive facilities near any national marine sanctuary.

(2) FACILITY REQUIREMENT.- Any facility developed under this subsection must emphasize the conservation goals and sustainable public uses of national marine sanctuaries by providing the public with information about the conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, or aesthetic qualities of the national marine sanctuary.

(e) CONSULTATION AND COORDINATION.- In conducting, supporting, and coordinating research, monitoring, evaluation, and education programs under subsection (a) and developing interpretive facilities under subsection (d), the Secretary may consult or coordinate with Federal, interstate, or regional agencies, States or local governments.

Sec. 310. SPECIAL USE PERMITS

(a) ISSUANCE OF PERMITS.--The Secretary may issue special use permits which authorize the conduct of specific activities in a national marine sanctuary if the Secretary determines such authorization is necessary--

(1) to establish conditions of access to and use of any sanctuary resource; or

(2) to promote public use and understanding of a sanctuary resource.

(b) PUBLIC NOTICE REQUIRED.- The Secretary shall provide appropriate public notice before identifying any category of activity subject to a special use permit under subsection (a).

(c) PERMIT TERMS.--A permit issued under this section--

(1) shall authorize the conduct of an activity only if that activity is compatible with the purposes for which the sanctuary is designated and with protection of sanctuary resources;

(2) shall not authorize the conduct of any activity for a period of more than 5 years unless renewed by the Secretary;

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(3) shall require that activities carried out under the permit be conducted in a manner that does not destroy, cause the loss of, or injure sanctuary resources; and

(4) shall require the permittee to purchase and maintain comprehensive general liability insurance, or post an equivalent bond, against claims arising out of activities conducted under the permit and to agree to hold the United States harmless against such claims.

(d) FEES.--

(1) Assessment and Collection.--The Secretary may assess and collect fees for the conduct of any activity under a permit issued under this section.

(2) Amount.--The amount of a fee under this subsection shall be equal to the sum of--

(A) costs incurred, or expected to be incurred, by the Secretary in issuing the permit;

(B) costs incurred, or expected to be incurred, by the Secretary as a direct result of the conduct of the activity for which the permit is issued, including costs of monitoring the conduct of the activity; and

(C) an amount which represents the fair market value of the use of the sanctuary resource.

(3) Use of Fees.--Amounts collected by the Secretary in the form of fees under this section may be used by the Secretary--

(A) for issuing and administering permits under this section; and

(B) for expenses of managing national marine sanctuaries.

(4) WAIVER OR REDUCTION OF FEES.- The Secretary may accept in-kind contributions in lieu of a fee under paragraph (2)(C), or waive or reduce any fee assessed under this subsection for any activity that does not derive a profit from the access to or use of sanctuary resources.

(e) VIOLATIONS.--Upon violation of a term or condition of a permit issued under this section, the Secretary may--

(1) suspend or revoke the permit without compensation to the permittee and without liability to the United States;

(2) assess a civil penalty in accordance with section 307; or

(3) both.

(f) REPORTS.--Each person issued a permit under this section shall submit an annual report to the Secretary not later than December 31 of each year which describes activities conducted under that permit and revenues derived from such activities during the year.

(g) FISHING.--Nothing in this section shall be considered to require a person to obtain a permit under this section for the conduct of any fishing activities in a national marine sanctuary.

Sec. 311. COOPERATIVE AGREEMENTS, DONATIONS, AND ACQUISITIONS

(a) AGREEMENTS AND GRANTS- The Secretary may enter into cooperative agreements, contracts, or other agreements with, or make grants to, States, local governments, regional agencies, interstate agencies, or other persons to carry out the purposes and policies of this title.

(b) AUTHORIZATION TO SOLICIT DONATIONS.--The Secretary may enter into such agreements with any nonprofit organization authorizing the organization to solicit private donations to carry out the purposes and policies of this title.

(c) DONATIONS.--The Secretary may accept donations of funds, property, and services for use in designating and administering national marine sanctuaries under this title. Donations accepted under this section shall be considered as a gift or bequest to or for the use of the United States.

(d) ACQUISITIONS.--The Secretary may acquire by purchase, lease, or exchange, any land, facilities, or other property necessary and appropriate to carry out the purposes and policies of this title

(e) USE OF RESOURCES OF OTHER GOVERNMENT AGENCIES.- The Secretary may, whenever appropriate, enter into an agreement with a State or other Federal agency to use the personnel, services, or facilities of such agency on a reimbursable or nonreimbursable basis, to assist in carrying out the purposes and policies of this title.

(f) AUTHORITY TO OBTAIN GRANTS.- Notwithstanding any other provision of law that prohibits a Federal agency from receiving assistance, the Secretary may apply for, accept, and use grants from other Federal agencies, States, local governments, regional agencies, interstate agencies, foundations, or other persons, to carry out the purposes and policies of this title.

Sec. 312. DESTRUCTION OR LOSS OF, OR INJURY TO, SANCTUARY RESOURCES

(a) LIABILITY FOR INTEREST.--

(1) Liability to UNITED STATES.--Any person who destroys, causes the loss of, or injures any sanctuary resource is liable to the United States for an amount equal to the sum of--

(A) the amount of response costs and damages resulting from the destruction, loss, or injury; and

(B) interests on that amount calculated in the manner described under section 1005 of the Oil Pollution Act of 1990.

(2) Liability In Rem.--Any vessel used to destroy, cause the loss of, or injure any sanctuary resource shall be liable in rem to the United States for response costs and damages resulting from

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such destruction, loss, or injury. The amount of that liability shall constitute a maritime lien on the vessel and may be recovered in an action in rem in the district court of the United States having jurisdiction over the vessel.

(3) Defenses.--A person is not liable under this subsection if that person establishes that--

(A) the destruction or loss of, or injury to, the sanctuary resource was caused solely by an act of God, an act of war, or an act or omission of a third party, and the person acted with due care;

(B) the destruction, loss, or injury was caused by an activity authorized by Federal or State law;
or

(C) the destruction, loss, or injury was negligible.

(4) Limits to Liability.--Nothing in sections 4281-4289 of the Revised Statutes of the United States or section 3 of the Act of February 13, 1893, shall limit the liability of any person under this title.

(b) RESPONSE ACTIONS AND DAMAGE ASSESSMENT.--

(1) Response Actions.--The Secretary may undertake or authorize all necessary actions to prevent or minimize the destruction or loss of, or injury to, sanctuary resources, or to minimize the imminent risk of such destruction, loss, or injury.

(2) Damage Assessment.--The Secretary shall assess damages to sanctuary resources in accordance with section 302(6).

(c) CIVIL ACTIONS FOR RESPONSE COSTS AND DAMAGES.--

(1) The Attorney General, upon request of the Secretary, may commence a civil action against any person or vessel who may be liable under subsection (a) for response costs and damages. The Secretary, acting as trustee for sanctuary resources for the United States, shall submit a request for such an action to the Attorney General whenever a person may be liable for such costs or damages.

(2) An action under this subsection may be brought in the United States district court for any district in which--

(A) the defendant is located, resides, or is doing business, in the case of an action against a person;

(B) the vessel is located, in the case of an action against a vessel; or

(C) the destruction of, loss of, or injury to a sanctuary resource occurred.

(d) **USE OF RECOVERED AMOUNTS.**--Response costs and damages recovered by the Secretary under this section shall be retained by the Secretary in the manner provided for in section 107(f)(1) of the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. 9607(f)(1)), and used as follows:

(1) **RESPONSE COSTS.**--Amounts recovered by the United States for costs of response actions and damage assessments under this section shall be used, as the Secretary considers appropriate--

(A) to reimburse the Secretary or any other Federal or State agency that conducted those activities; and

(B) after reimbursement of such costs, to restore, replace, or acquire the equivalent of any sanctuary resource.

(2) **OTHER AMOUNTS.**--All other amounts recovered shall be used, in order of priority--

(A) to restore, replace, or acquire the equivalent of the sanctuary resources that were the subject of the action, including for costs of monitoring and the costs of curation and conservation of archeological, historical, and cultural sanctuary resources;

(B) to restore degraded sanctuary resources of the national marine sanctuary that was the subject of the action, giving priority to sanctuary resources and habitats that are comparable to the sanctuary resources that were the subject of the action; and

(C) to restore degraded sanctuary resources of other national marine sanctuaries.

(3) **Federal-State Coordination.**--Amounts recovered under this section with respect to sanctuary resources lying within the jurisdiction of a State shall be used under paragraphs (2)(A) and (B) in accordance with the court decree or settlement agreement and an agreement entered into by the Secretary and the Governor of that State.

(e) **STATUTE OF LIMITATIONS.**--An action for response costs or damages under subsection (c) shall be barred unless the complaint is filed within 3 years after the date on which the Secretary completes a damage assessment and restoration plan for the sanctuary resources to which the action relates.

SEC. 313. AUTHORIZATION OF APPROPRIATIONS

There are authorized to be appropriated to the Secretary--

(1) to carry out this title--

(A) \$32,000,000 for fiscal year 2001;

(B) \$34,000,000 for fiscal year 2002;

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(C) \$36,000,000 for fiscal year 2003;

(D) \$38,000,000 for fiscal year 2004;

(E) \$40,000,000 for fiscal year 2005; and

(2) for construction projects at national marine sanctuaries, \$6,000,000 for each of fiscal years 2001, 2002, 2003, 2004, and 2005.

Sec. 314. U.S.S. MONITOR ARTIFACTS AND MATERIALS

(a) CONGRESSIONAL POLICY.--In recognition of the historical significance of the wreck of the United States ship Monitor to coastal North Carolina and to the area off the coast of North Carolina known as the Graveyard of the Atlantic, the Congress directs that a suitable display of artifacts and materials from the United States ship Monitor be maintained permanently at an appropriate site in coastal North Carolina. [P.L. 102-587 authorized a grant for the acquisition of space in Hatteras Village, NC, for display of artifacts and administration and operations of the Monitor National Marine Sanctuary.

(b) DISCLAIMER.--This section shall not affect the following:

(1) Responsibilities Of Secretary.--The responsibilities of the Secretary to provide for the protection, conservation, and display of artifacts and materials from the United States ship Monitor.

(2) Authority Of Secretary.--The authority of the Secretary to designate the Mariner's Museum, located at Newport News, Virginia, as the principal museum for coordination of activities referred to in paragraph (1).

Sec. 315. ADVISORY COUNCILS

(a) ESTABLISHMENT.--The Secretary may establish one or more advisory councils (in this section referred to as an 'Advisory Council') to advise and make recommendations to the Secretary regarding the designation and management of national marine sanctuaries. The Advisory Councils shall be exempt from the Federal Advisory Committee Act.

(b) MEMBERSHIP.--Members of the Advisory Councils may be appointed from among--

(1) persons employed by Federal or State agencies with expertise in management of natural resources;

(2) members of relevant Regional Fishery Management Councils established under section 302 of the Magnuson-Stevens Act; and

(3) representatives of local user groups, conservation and other public interest organizations, scientific organizations, educational organizations, or others interested in the protection and multiple use management of sanctuary resources.

(c) LIMITS ON MEMBERSHIP.--For sanctuaries designated after the date of enactment of the National Marine Sanctuaries Program Amendments Act of 1992, the membership of Advisory Councils shall be limited to no more than 15 members.

(d) STAFFING AND ASSISTANCE.--The Secretary may make available to an Advisory Council any staff, information, administrative services, or assistance the Secretary determines are reasonably required to enable the Advisory Council to carry out its functions.

(e) PUBLIC PARTICIPATION AND PROCEDURAL MATTERS.--The following guidelines apply with respect to the conduct of business meetings of an Advisory Council:

(1) Each meeting shall be open to the public, and interested persons shall be permitted to present oral or written statements on items on the agenda.

(2) Emergency meetings may be held at the call of the chairman or presiding officer.

(3) Timely notice of each meeting, including the time, place, and agenda of the meeting, shall be published locally and in the Federal Register, except that in the case of a meeting of an Advisory Council established to provide assistance regarding any individual national marine sanctuary the notice is not required to be published in the Federal Register.

(4) Minutes of each meeting shall be kept and contain a summary of the attendees and matters discussed.

Sec. 316. ENHANCING SUPPORT FOR NATIONAL MARINE SANCTUARIES

(a) AUTHORITY.--The Secretary may establish a program consisting of--

(1) the creation, adoption, and publication in the Federal Register by the Secretary of a symbol for the national marine sanctuary program, or for individual national marine sanctuaries or the System;

(2) the solicitation of persons to be designated as official sponsors of the national marine sanctuary program or of individual national marine sanctuaries;

(3) the designation of persons by the Secretary as official sponsors of the national marine sanctuary program or of individual sanctuaries;

(4) the authorization by the Secretary of the manufacture, reproduction, or other use of any symbol published under paragraph (1), including the sale of items bearing such a symbol, by

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official sponsors of the national marine sanctuary program or of individual national marine sanctuaries;

(5) the creation, marketing, and selling of products to promote the national marine sanctuary program, and entering into exclusive or nonexclusive agreements authorizing entities to create, market or sell on the Secretary's behalf;

(6) the solicitation and collection by the Secretary of monetary or in-kind contributions from official sponsors for the manufacture, reproduction or use of the symbols published under paragraph (1);

(7) the retention of any monetary or in-kind contributions collected under paragraphs (5) and (6) by the Secretary; and

(8) the expenditure and use of any monetary and in-kind contributions, without appropriation, by the Secretary to designate and manage national marine sanctuaries.

Monetary and in-kind contributions raised through the sale, marketing, or use of symbols and products related to an individual national marine sanctuary shall be used to support that sanctuary.

(b) **CONTRACT AUTHORITY.**--The Secretary may contract with any person for the creation of symbols or the solicitation of official sponsors under subsection (a).

(c) **RESTRICTIONS.**--The Secretary may restrict the use of the symbols published under subsection (a), and the designation of official sponsors of the national marine sanctuary program or of individual national marine sanctuaries to ensure compatibility with the goals of the national marine sanctuary program.

(d) **PROPERTY OF UNITED STATES.**-- Any symbol which is adopted by the Secretary and published in the Federal Register under subsection (a) is deemed to be the property of the United States.

(e) **PROHIBITED ACTIVITIES.**--It is unlawful for any person--

(1) designated as an official sponsor to influence or seek to influence any decision by the Secretary or any other Federal official related to the designation or management of a national marine sanctuary, except to the extent that a person who is not so designated may do so;

(2) to represent himself or herself to be an official sponsor absent a designation by the Secretary;

(3) to manufacture, reproduce, or otherwise use any symbol adopted by the Secretary under subsection (a)(1), including to sell any item bearing such a symbol, unless authorized by the Secretary under subsection (a)(4) or subsection (f); or

(4) to violate any regulation promulgated by the Secretary under this section.

(f) COLLABORATIONS.--The Secretary may authorize the use of a symbol adopted by the Secretary under subsection (a)(1) by any person engaged in a collaborative effort with the Secretary to carry out the purposes and policies of this title and to benefit a national marine sanctuary or the System.

(g) AUTHORIZATION FOR NON-PROFIT PARTNER ORGANIZATION TO SOLICIT SPONSORS.--

(1) IN GENERAL.--The Secretary may enter into an agreement with a non-profit partner organization authorizing it to assist in the administration of the sponsorship program established under this section. Under an agreement entered into under this paragraph, the Secretary may authorize the non-profit partner organization to solicit persons to be official sponsors of the national marine sanctuary system or of individual national marine sanctuaries, upon such terms as the Secretary deems reasonable and will contribute to the successful administration of the sanctuary system. The Secretary may also authorize the non-profit partner organization to collect the statutory contribution from the sponsor, and, subject to paragraph (2), transfer the contribution to the Secretary.

(2) REIMBURSEMENT FOR ADMINISTRATIVE COSTS.--Under the agreement entered into under paragraph (1), the Secretary may authorize the non-profit partner organization to retain not more than 5 percent of the amount of monetary contributions it receives from official sponsors under the agreement to offset the administrative costs of the organization in soliciting sponsors.

(3) PARTNER ORGANIZATION DEFINED.--In this subsection, the term `partner organization' means an organization that--

(A) draws its membership from individuals, private organizations, corporation, academic institutions, or State and local governments; and

(B) is established to promote the understanding of, education relating to, and the conservation of the resources of a particular sanctuary or 2 or more related sanctuaries.

Sec. 318. DR. NANCY FOSTER SCHOLARSHIP PROGRAM

(a) ESTABLISHMENT.--The Secretary shall establish and administer through the National Ocean Service the Dr. Nancy Foster Scholarship Program. Under the program, the Secretary shall award graduate education scholarships in oceanography, marine biology or maritime archeology, to be known as Dr. Nancy Foster Scholarships.

(b) PURPOSES.--The purposes of the Dr. Nancy Foster Scholarship Program are--

(1) to recognize outstanding scholarship in oceanography, marine biology, or maritime archeology, particularly by women and members of minority groups; and

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(2) to encourage independent graduate level research in oceanography, marine biology, or maritime archeology.

(c) AWARD.--Each Dr. Nancy Foster Scholarship--

(1) shall be used to support graduate studies in oceanography, marine biology, or maritime archeology at a graduate level institution of higher education; and

(2) shall be awarded in accordance with guidelines issued by the Secretary.

(d) DISTRIBUTION OF FUNDS.--The amount of each Dr. Nancy Foster Scholarship shall be provided directly to a recipient selected by the Secretary upon receipt of certification that the recipient will adhere to a specific and detailed plan of study and research approved by a graduate level institution of higher education.

(e) FUNDING.--Of the amount available each fiscal year to carry out this title, the Secretary shall award 1 percent as Dr. Nancy Foster Scholarships.

(f) SCHOLARSHIP REPAYMENT REQUIREMENT.--The Secretary shall require an individual receiving a scholarship under this section to repay the full amount of the scholarship to the Secretary if the Secretary determines that the individual, in obtaining or using the scholarship, engaged in fraudulent conduct or failed to comply with any term or condition of the scholarship.

(g) MARITIME ARCHEOLOGY DEFINED.--In this section the term 'maritime archeology' includes the curation, preservation, and display of maritime artifacts.

Appendix V: Species List

This appendix includes species lists of marine vertebrates (birds, mammals, fish, and reptiles), invertebrates, and algae occurring in CBNMS.

The following lists of species occurring in CBNMS have been compiled from verified species lists collected from research and monitoring cruises conducted within CBNMS or from specimens curated in collections at the California Academy of Sciences or the Smithsonian. Scientific names have been verified through the World Register of Marine Species (WoRMS). The lists include Federal listed status, estimated population size (when known), and geographical distribution (when known). All of the lists include the following headings (except for Federal listed status for invertebrates and algae):

COMMON NAME - The common (English) name of the species.

SCIENTIFIC NAME - The scientific (Latin) name of the species.

FS – The Federal listed status as of January 2014 (as found at <http://www.fws.gov/angered/>). These designations are given if any population or subspecies occurring in the sanctuary is so listed.

- E – Endangered
- T – Threatened
- SC – Species of Concern: may be endangered or threatened; not enough information has been gathered to support listing at this time.
- C – Candidate: to become a proposed species for listing as endangered or threatened.
- D – Delisted; to be monitored for 5 years.

The bird, mammal, and reptile lists also include the following headings:

POPEST – The estimated population size in a given location (LOCA, see below). When numbers are given they represent 1000s of individuals.

LOCA - The geographic location (area) for which the population estimate applies, as follows:

- World – World
- N.Am – North America
- Pacif – Pacific Ocean or Pacific North American Coast
- Calif – California

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VERTEBRATES

BIRDS

The bird species list was compiled from verified observations from the Cordell Bank Ocean Monitoring Program (CBOMP) and the Applied California Current Ecosystem Studies (ACCESS) partnership, as well as from expert observations, per Rich Stallcup, Steve Howell, and Peter Pyle. When no population estimates were available, the terms "Common," "Uncommon," and "Rare" were used as general indicators of the worldwide population size.

Birds				
COMMON NAME	SCIENTIFIC NAME	FED. STATUS	POP. ESTIMATE	LOCATION OF POP. EST
Red-throated Loon	<i>Gavia stellata</i>		25	N.Am
Pacific Loon	<i>Gavia pacifica</i>		50	World
Common Loon	<i>Gavia immer</i>	SC	500	N.Am
Red-necked Grebe	<i>Podiceps grisegena</i>		45	N.Am
Laysan Albatross	<i>Phoebastria immutabilis</i>		2600	World
Black-footed Albatross	<i>Phoebastria nigripes</i>		200	World
Short-tailed Albatross	<i>Phoebastria albatrus</i>	E	1	World
Light-mantled Albatross	<i>Phoebastria palpebrata</i>		50	World
Shy Albatross	<i>Thalassarche cauta</i>		15	World
Northern Fulmar	<i>Fulmarus glacialis</i>		1400	Pacif
Murphy's Petrel	<i>Pterodroma ultima</i>		Uncommon	
Mottled Petrel	<i>Pterodroma inexpectata</i>		Uncommon	
Dark-rumped Petrel	<i>Pterodroma phaeopygia</i>	E	70	World
Pink-footed Shearwater	<i>Puffinus creatopus</i>		Common	
Flesh-footed Shearwater	<i>Puffinus carneipes</i>		Uncommon	
Buller's Shearwater	<i>Puffinus bulleri</i>		Uncommon	
Sooty Shearwater	<i>Puffinus griseus</i>		Common	
Short-tailed Shearwater	<i>Puffinus tenuirostris</i>		Common	
Greater Shearwater	<i>Puffinus gravis</i>		Common	
Manx Shearwater	<i>Puffinus puffinus</i>		1000	World
Black-vented Shearwater	<i>Puffinus opisthomelas</i>		30	World
Cook's Petrel	<i>Pterodroma cookii</i>		1200	World
Mottled Petrel	<i>Pterodroma inexpectata</i>		Uncommon	
Dark-rumped Petrel	<i>Pterodroma phaeopygia</i>	T	Uncommon	
Murphy's Petrel	<i>Pterodroma ultima</i>		Uncommon	
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>		Common	
Fork-tailed Storm-Petrel	<i>Oceanodroma furcata</i>		1	Calif

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Birds				
COMMON NAME	SCIENTIFIC NAME	FED. STATUS	POP. ESTIMATE	LOCATION OF POP. EST
Leach's Storm-Petrel	<i>Oceanodroma leucorhoa</i>		20	Calif
Ashy Storm-Petrel	<i>Oceanodroma homochroa</i>	SC	7.5	Calif
Black Storm-Petrel	<i>Oceanodroma melania</i>		Uncommon	
Least Storm-Petrel	<i>Oceanodroma microsoma</i>		100	World
Brown Pelican	<i>Pelecanus occidentalis</i>	D	150	Pacif
Brandt's Cormorant	<i>Phalacrocorax penicillatus</i>		125	Calif
Double-crested Cormorant	<i>Phalacrocorax auritus</i>		10	Calif
Pelagic Cormorant	<i>Phalacrocorax pelagicus</i>		25	Calif
Magnificent Frigatebird	<i>Fregata magnificens</i>		Common	
Brant	<i>Branta bernicla</i>		50	Pacif
Surf Scoter	<i>Melanitta perspicillata</i>		536	Pacif
Black Scoter	<i>Melanitta nigra</i>		Common	
Red-necked Phalarope	<i>Phalaropus lobatus</i>		2500	N.Am
Red Phalarope	<i>Phalaropus fulicaria</i>		1000	N.Am
South Polar Skua	<i>Catharacta maccormicki</i>		Uncommon	
Pomarine Jaeger	<i>Stercorarius pomarinus</i>		Common	
Parasitic Jaeger	<i>Stercorarius parasiticus</i>		Common	
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>		250	World
Bonaparte's Gull	<i>Larus philadelphia</i>		Uncommon	
Heermann's Gull	<i>Larus heermanni</i>		1500	World
Mew Gull	<i>Larus canus</i>		Uncommon	
California Gull	<i>Larus californicus</i>		Common	
Herring Gull	<i>Larus argentatus</i>		500	N.Am
Thayer's Gull	<i>Larus thayeri</i>		Uncommon	
Western Gull	<i>Larus occidentalis</i>		60	Calif
Glaucous-winged Gull	<i>Larus glaucescens</i>		200	N.Am
Glaucous Gull	<i>Larus hyperboreus</i>		Uncommon	
Sabine's Gull	<i>Xema sabini</i>		Uncommon	
Black-legged Kittiwake	<i>Rissa tridactyla</i>		2600	Pacif
Caspian Tern	<i>Sterna caspia</i>		35	N.Am
Elegant Tern	<i>Sterna elegans</i>		29	World
Common Tern	<i>Sterna hirundo</i>		100	N.Am
Arctic Tern	<i>Sterna paradisaea</i>		Common	
Forster's Tern	<i>Sterna forsteri</i>		400	World
Sooty Tern	<i>Sterna fuscata</i>		2100	World
Common Murre	<i>Uria aalge</i>		800	Calif
Pigeon Guillemot	<i>Cephus columba</i>		30	Calif
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	T	6.5	Calif
Scripps's Murrelet	<i>Synthliboramphus scrippsi</i>	SC	8	World
Ancient Murrelet	<i>Synthliboramphus antiquus</i>		1200	World

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Birds				
COMMON NAME	SCIENTIFIC NAME	FED. STATUS	POP. ESTIMATE	LOCATION OF POP. EST
Cassin's Auklet	<i>Ptychoramphus aleuticus</i>	SC	75	Calif
Rhinoceros Auklet	<i>Cerorhinca monocerata</i>		5	Calif
Horned Puffin	<i>Fratercula corniculata</i>		Common	
Tufted Puffin	<i>Fratercula cirrhata</i>		0.7	Calif

MAMMALS

The mammal species list was compiled from verified observations from the CBOMP and the ACCESS partnership.

Mammals				
COMMON NAME	SCIENTIFIC NAME	FED. STATUS	POP. ESTIMATE	LOCATION OF POP. EST
Blue Whale	<i>Balaenoptera musculus</i>	E	2	Pacif
Fin Whale	<i>Balaenoptera physalus</i>	E	1.2	C,O,W
Minke Whale	<i>Balaenoptera acutorostrata</i>		0.6	Calif
Humpback Whale	<i>Megaptera novaeangliae</i>	E	6	Pacif
Gray Whale	<i>Eschrichtius robustus</i>	D	26	World
Harbor Porpoise	<i>Phocoena phocoena</i>		16.7	Cent-No. Calif
Dall's Porpoise	<i>Phocoenoides dalli</i>		117.5	C,O,W
Pacific White-sided Dolphin	<i>Lagenorhynchus obliquidens</i>		25.8	C,O, W
Northern Right Whale Dolphin	<i>Lissodelphis borealis</i>		13.7	C,O, W
Risso's Dolphin	<i>Grampus griseus</i>		16.5	C,O,W
Killer Whale	<i>Orcinus orca</i>	E ⁶	1	C,O,W
Sperm Whale	<i>Physeter macrocephalus</i>	E	1800	World
Steller Sea Lion	<i>Eumetopius jubatus</i>		0.4	Calif
California Sea Lion	<i>Zalophus californianus</i>		214	C,O,W
Northern Fur Seal	<i>Callorhinus ursinus</i>		4.3	Calif
Northern Elephant Seal	<i>Mirounga angustirostris</i>		84	Calif

⁶ In 2006, the Distinct Population Segment (DPS) of southern killer whales (*Orcinus orca*) was designated as Endangered under the MMPA and ESA. Recent anecdotal information provides information that some of the migratory and feeding killer whales within GFNMS, CBNMS, and MBNMS may be part of this DPS and therefore have been noted as Endangered in the CBNMS species inventory.

Mammals				
COMMON NAME	SCIENTIFIC NAME	FED. STATUS	POP. ESTIMATE	LOCATION OF POP. EST
Harbor Seal	<i>Phoca vitulina</i>		28	Calif
Harbor Porpoise	<i>Phocoena phocoena</i>		24	Calif

FISH

The fish species list was compiled from verified observations from the *Delta* submersible, ROVs and a towed camera sled, as well as collections from NMFS bottom trawl, mid-water trawl, and hook and line surveys.

Fish		
COMMON NAME	SCIENTIFIC NAME	FED. STATUS
Giant Grenadier	<i>Albatrossia pectoralis</i>	
California Slickhead	<i>Alepocephalus tenebrosus</i>	
Whitebait Smelt	<i>Allosmerus elongatus</i>	
American Shad	<i>Alosa sapidissima</i>	
Pacific Sand Lance	<i>Ammodytes hexapterus</i>	
Wolf-eel	<i>Anarrhichthys ocellatus</i>	
Fangtooth	<i>Anoplogaster cornuta</i>	
Sablefish	<i>Anoplopoma fimbria</i>	
Pacific Flatnose	<i>Antimora microlepis</i>	
Brown Cat Shark	<i>Apristurus brunneus</i>	
Longnose Cat Shark	<i>Apristurus kampae</i>	
Pacific Argentine	<i>Argentina sialis</i>	
Coralline Sculpin	<i>Artedius corallinus</i>	
Arrowtooth Flounder	<i>Atheresthes stomias</i>	
Highfin Dragonfish	<i>Bathophilus flemingi</i>	
Snubnose Blacksmelt	<i>Bathylagoides wesethi</i>	
Blackfin Poacher	<i>Bathyagonus nigripinnis</i>	
Pacific Blacksmelt	<i>Bathylagus pacificus</i>	
Deepsea Skate	<i>Bathyraja abyssicola</i>	
Sandpaper Skate	<i>Bathyraja interrupta</i>	
Roughtail Skate	<i>Bathyraja trachura</i>	
Twoline Eelpout	<i>Bothrocara brunneum</i>	
Shortsnout Eelpout	<i>Bothrocara molle</i>	
Red Brotula	<i>Brosmophycis marginata</i>	
Snailfish	<i>Careproctus cypselurus</i>	

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Fish		
COMMON NAME	SCIENTIFIC NAME	FED. STATUS
Blacktail Snailfish	<i>Careproctus melanurus</i>	
Ocean Whitefish	<i>Caulolatilus princeps</i>	
Dogtooth Lampfish	<i>Ceratoscopelus townsendi</i>	
Pacific Viperfish	<i>Chauliodus macouni</i>	
Spotted Cusk-eel	<i>Chilara taylori</i>	
Mosshead Warbonnet	<i>Chirolophis nugator</i>	
Pacific Sanddab	<i>Citharichthys sordidus</i>	
Speckled Sanddab	<i>Citharichthys stigmaeus</i>	
Pacific Herring	<i>Clupea pallasii pallasii</i>	
Shoulderspot Grenadier	<i>Coelorinchus scaphopsis</i>	
Pacific Saury	<i>Cololabis saira</i>	
Pacific Grenadier	<i>Coryphaenoides acrolepis</i>	
Small-Toothed Bristlemouth	<i>Cyclothone microdon</i>	
Shiner Perch	<i>Cymatogaster aggregata</i>	
California Headlightfish	<i>Diaphus theta</i>	
Blackbelly Snailfish	<i>Elassodiscus caudatus</i>	
Deepsea Sole	<i>Embassichthys bathybius</i>	
Northern Anchovy	<i>Engraulis mordax</i>	
Petrale Sole	<i>Eopsetta jordani</i>	
Black Hagfish	<i>Eptatretus deani</i>	
Pacific Hagfish	<i>Eptatretus stoutii</i>	
Pacific Cod	<i>Gadus macrocephalus</i>	
White Croaker	<i>Genyonemus lineatus</i>	
Rex Sole	<i>Glyptocephalus zachirus</i>	
Brown Irish Lord	<i>Hemilepidotus spinosus</i>	
Kelp Greenling	<i>Hexagrammos decagrammus</i>	
Bluntnose Sixgill Shark	<i>Hexanchus griseus</i>	
Flathead Sole	<i>Hippoglossoides elassodon</i>	
Pacific Halibut	<i>Hippoglossus stenolepis</i>	
Spotted Ratfish	<i>Hydrolagus colliei</i>	
Spotfin Surfperch	<i>Hyperprosopon anale</i>	
Surf Smelt	<i>Hypomesus pretiosus</i>	
Diamond Turbot	<i>Hypsopsetta guttulata</i>	
Rainbow Surfperch	<i>Hypsurus caryi</i>	
Threadfin Sculpin	<i>Icelinus filamentosus</i>	
Spotfin Sculpin	<i>Icelinus tenuis</i>	
Medusafish	<i>Icichthys lockingtoni</i>	
Ragfish	<i>Icosteus aenigmaticus</i>	
Pacific Blackdragon	<i>Idiacanthus antrostomus</i>	
Butter Sole	<i>Isopsetta isolepis</i>	
Shortfin Mako	<i>Isurus oxyrinchus</i>	
Longfin Sculpin	<i>Jordania zonope</i>	

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COMMON NAME	SCIENTIFIC NAME	FED. STATUS
Salmon Shark	<i>Lamna ditropis</i>	
Brokenline Lanternfish	<i>Lampanyctus jordani</i>	
Bay Goby	<i>Lepidogobius lepidus</i>	
Rock Sole	<i>Lepidopsetta bilineata</i>	
Staghorn Sculpin	<i>Leptocottus armatus</i>	
Slender Barracudina	<i>Lestidiops ringens</i>	
Northern Smoothtongue	<i>Leuroglossus schmidtii</i>	
California Smoothtongue	<i>Leuroglossus stilbius</i>	
Eared Blacksmelt	<i>Lipolagus ochotensis</i>	
Snakehead Eelpout	<i>Lycenchelys crotalinus</i>	
Blackmouth Eelpout	<i>Lycodapus fierasfer</i>	
Bigfin Eelpout	<i>Lycodes cortezianus</i>	
Black Eelpout	<i>Lycodes diapterus</i>	
Blackbelly Eelpout	<i>Lycodes pacificus</i>	
Bearded Eelpout	<i>Lycinema barbatum</i>	
Slender Sole	<i>Lyopsetta exilis</i>	
Pacific Hake	<i>Merluccius productus</i>	
Pacific Tomcod	<i>Microgadus proximus</i>	
Dover Sole	<i>Microstomus pacificus</i>	
Ocean Sunfish	<i>Mola mola</i>	
Brown Smoothhound	<i>Mustelus henlei</i>	
Pinpoint Lampfish	<i>Nannobranchium regale</i>	
Broadfin Lampfish	<i>Nannobranchium ritteri</i>	
California Grenadier	<i>Nezumia stelgidolepis</i>	
Pygmy Poacher	<i>Odontopyxis trispinosa</i>	
Coho Salmon (Silver Salmon)	<i>Oncorhynchus kisutch</i>	E & T regional
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	E & T regional
Lingcod	<i>Ophiodon elongatus</i>	
Painted Greenling	<i>Oxylebius pictus</i>	
California Halibut	<i>Paralichthys californicus</i>	
Red Snailfish	<i>Paraliparis dactylosus</i>	
Filetail Cat Shark	<i>Parmaturus xaniurus</i>	
English Sole	<i>Parophrys vetulus</i>	
Pacific Pompano	<i>Peprilus simillimus</i>	
Starry Flounder	<i>Platichthys stellatus</i>	
Bluebarred Prickleback	<i>Plectobranthus evides</i>	
Curlfin Sole	<i>Pleuronichthys decurrens</i>	
Hornyhead Turbot	<i>Pleuronichthys verticalis</i>	
Sturgeon Poacher	<i>Podothecus accipenserinus</i>	

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Fish		
COMMON NAME	SCIENTIFIC NAME	FED. STATUS
Plainfin Midshipman	<i>Porichthys notatus</i>	
Blue Shark	<i>Prionace glauca</i>	
Bigeye Lanternfish	<i>Protomyctophum thompsoni</i>	
Sand Sole	<i>Psettichthys melanostictus</i>	
Stout Blacksmelt	<i>Pseudobathylagus milleri</i>	
Slim Sculpin	<i>Radulinus asprellus</i>	
Big Skate	<i>Raja binoculata</i>	
California Skate	<i>Raja inornata</i>	
Longnose Skate	<i>Raja rhina</i>	
Starry Skate	<i>Raja stellulata</i>	
Blackeye Goby	<i>Rhinogobiops nicholsii</i>	
Puget Sound Sculpin	<i>Ruscarius meanyi</i>	
Pacific Sardine	<i>Sardinops sagax</i>	
Pacific Mackerel	<i>Scomber japonicus</i>	
Cabezon	<i>Scorpaenichthys marmoratus</i>	
Rougheye Rockfish	<i>Sebastes aleutianus</i>	
Pacific Ocean Perch	<i>Sebastes alutus</i>	
Brown Rockfish	<i>Sebastes auriculatus</i>	
Aurora Rockfish	<i>Sebastes aurora</i>	
Redbanded Rockfish	<i>Sebastes babcocki</i>	
Gopher Rockfish	<i>Sebastes carnatus</i>	
Copper Rockfish	<i>Sebastes caurinus</i>	
Greenspotted Rockfish	<i>Sebastes chlorostictus</i>	
Starry Rockfish	<i>Sebastes constellatus</i>	
Darkblotched Rockfish	<i>Sebastes crameri</i>	
Splitnose Rockfish	<i>Sebastes diploproa</i>	
Greenstriped Rockfish	<i>Sebastes elongatus</i>	
Swordspine Rockfish	<i>Sebastes ensifer</i>	
Widow Rockfish	<i>Sebastes entomelas</i>	
Pink Rockfish	<i>Sebastes eos</i>	
Yellowtail Rockfish	<i>Sebastes flavidus</i>	
Chilipepper	<i>Sebastes goodei</i>	
Rosethorn Rockfish	<i>Sebastes helvomaculatus</i>	
Squarespot Rockfish	<i>Sebastes hopkinsi</i>	
Shortbelly Rockfish	<i>Sebastes jordani</i>	
Cowcod	<i>Sebastes levis</i>	
Quillback Rockfish	<i>Sebastes maliger</i>	
Black Rockfish	<i>Sebastes melanops</i>	
Blackgill Rockfish	<i>Sebastes melanostomus</i>	
Vermilion Rockfish	<i>Sebastes miniatus</i>	
Blue Rockfish	<i>Sebastes mystinus</i>	
China Rockfish	<i>Sebastes nebulosus</i>	
Tiger Rockfish	<i>Sebastes nigrocinctus</i>	

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Fish		
COMMON NAME	SCIENTIFIC NAME	FED. STATUS
Speckled Rockfish	<i>Sebastes ovalis</i>	
Bocaccio	<i>Sebastes paucispinis</i>	
Canary Rockfish	<i>Sebastes pinniger</i>	
Redstripe Rockfish	<i>Sebastes proriger</i>	
Rosy Rockfish	<i>Sebastes rosaceus</i>	
Greenblotched Rockfish	<i>Sebastes rosenblatti</i>	
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	
Flag Rockfish	<i>Sebastes rubrivinctus</i>	
Bank Rockfish	<i>Sebastes rufus</i>	
Stripetail Rockfish	<i>Sebastes saxicola</i>	
Halfbanded Rockfish	<i>Sebastes semicinctus</i>	
Olive Rockfish	<i>Sebastes serranoides</i>	
Pygmy Rockfish	<i>Sebastes wilsoni</i>	
Sharpchin Rockfish	<i>Sebastes zacentrus</i>	
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	
Longspine Thornyhead	<i>Sebastolobus altivelis</i>	
Spiny Dogfish	<i>Squalus acanthias</i>	
Northern Lampfish	<i>Stenobrachius leucopsarus</i>	
California Lanternfish	<i>Symbolophorus californiensis</i>	
California Tonguefish	<i>Symphurus atricaudus</i>	
Longfin Dragonfish	<i>Tactostoma macropus</i>	
Threadfin Slickhead	<i>Talismania bifurcata</i>	
Blue Lanternfish	<i>Tarletonbeania crenularis</i>	
Eulachon	<i>Thaleichthys pacificus</i>	
Albacore	<i>Thunnus alalunga</i>	
Pacific Electric Ray	<i>Torpedo californica</i>	
King-of-the-Salmon	<i>Trachipterus altivelis</i>	
Jack Mackerel	<i>Trachurus symmetricus</i>	
Blacktip Poacher	<i>Xeneretmus latifrons</i>	
Smootheye Poacher	<i>Xeneretmus leiops</i>	
Bluespotted Poacher	<i>Xeneretmus triacanthus</i>	
Pink Surfperch	<i>Zalembius rosaceus</i>	
Shortspine Combfish	<i>Zaniolepis frenata</i>	
Longspine Combfish	<i>Zaniolepis latipinnis</i>	

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REPTILES

No population estimate was available, so the term "Rare" was used as a general indicator of the worldwide population size.

Reptiles				
COMMON NAME	SCIENTIFIC NAME	FED. STATUS	POP. ESTIMATE	LOCATION OF POP. EST
Leatherback Turtle	<i>Dermochelys coriacea</i>	E	Rare	World

INVERTEBRATES

The invertebrate species list was compiled from verified observations from the *Delta* submersible, ROVs and a towed camera sled, collections from Cordell Expeditions, NOAA divers, ACCESS, and specimens curated in collections at the California Academy of Sciences or the Smithsonian. None of the species have federal status under the Endangered Species Act, and population estimates are not available.

Invertebrates	
COMMON NAME	SCIENTIFIC NAME
	Kingdom Monera
bacterial mat	<i>Beggiatoa spp.</i>
	Kingdom Animalia
	Porifera
red volcano sponge	<i>Acarnus erithacus</i>
sponge	<i>Antho lithophoenix</i>
glass sponge	<i>Aphrocallistes vastus</i>
predatory sponge	<i>Asbestopluma</i>
sponge	<i>Clathria microjoanna</i>
sponge	<i>Clathria spongigartina</i>
sponge	<i>Endectyon hyle</i>
sponge	<i>Forcepia (Forcepia) elvini</i>
sponge	<i>Geodia agassizi</i>
sponge	<i>Geodia gibberosa</i>
sponge	<i>Geodia mesotriaena</i>
sponge	<i>Guitarra abbotti</i>
bread crumb sponge	<i>Halichondria panicea</i>
sponge	<i>Haliclona textapatina</i>
sponge	<i>Hymeniacidon sinapium</i>

Invertebrates	
COMMON NAME	SCIENTIFIC NAME
sponge	<i>Iophon lamella</i>
sponge	<i>Iophon nigricans</i>
sponge	<i>Leucandra heathi</i>
sponge	<i>Leucandra losangelensis</i>
sponge	<i>Lissodendoryx firma</i>
sponge	<i>Lissodendoryx kyma</i>
sponge	<i>Mycale adhaerens</i>
sponge	<i>Mycale lingua</i>
sponge	<i>Mycale psila</i>
sponge	<i>Mycale toporoki</i>
sponge	<i>Myxilla incrustans</i>
sponge	<i>Myxilla parasitica</i>
sponge	<i>Neopetrosia problematica</i>
sponge	<i>Neopetrosia zumi</i>
sponge	<i>Penares cortius</i>
sponge	<i>Poecillastra rickettsi</i>
aggregate vase sponge	<i>Polymastia pachymastia</i>
sponge	<i>Sidonops bicolor</i>
gray moon sponge	<i>Spheciospongia confoederata</i>
white sponge	<i>Stelletta clarella</i>
sponge	<i>Stelletta estrella</i>
sponge	<i>Tedania gurjanovae</i>
sponge	<i>Tethya californiana</i>
sponge	<i>Xestospongia diprosopia</i>
sponge	<i>Xestospongia edapha</i>
	Cnidaria
anemone	<i>Actinauge verrilli</i>
siphonophore	<i>Agalma elegans</i>
pink helmet	<i>Aglantha digitale</i>
thecate hydroids	<i>Aglaophenia latirostris</i>
jellyfish	<i>Aglaura hemistoma</i>
siphonophore	<i>Amphicaryon ernesti</i>
mushroom coral	<i>Anthomastus ritteri</i>
anemone	<i>Anthopleura artemisia</i>
sea pen	<i>Anthoptilum grandiflorum</i>
moon jelly	<i>Aurelia aurita</i>
orange cup coral	<i>Balanophyllia elegans</i>
cup coral	<i>Caryophyllia alaskensis</i>
cup coral	<i>Caryophyllia arnoldi</i>
siphonophore	<i>Chelophyes appendiculata</i>
Purple-striped jelly	<i>Chrysaora colorata</i>
Pacific sea nettle	<i>Chrysaora fuscescens</i>

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Invertebrates	
COMMON NAME	SCIENTIFIC NAME
Northern Sea nettle	<i>Chrysaora melanaster</i>
siphonophore	<i>Chuniphyes multidentata</i>
thecate hydroids	<i>Clytia gregaria</i>
silky medusa	<i>Colobonema sericeum</i>
strawberry anemone	<i>Corynactis californica</i>
lion's mane	<i>Cyanea capillata</i>
cup coral	<i>Desmophyllum dianthus</i>
siphonophore	<i>Diphyes bojani</i>
siphonophore	<i>Diphyes dispar</i>
siphonophore	<i>Dromalia alexandri</i>
thecate hydroids	<i>Earleria cellularia</i>
orange zoanthid	<i>Epizoanthus scotinus</i>
siphonophore	<i>Eudoxoides mitra</i>
thecate hydroids	<i>Eutonina indicans</i>
orange hydroid	<i>Garveia annulata</i>
sea pen	<i>Halipteris californica</i>
cup coral	<i>Javania californica</i>
cup coral	<i>Labyrinthocyathus quaylei</i>
tentacle shedding anemone	<i>Liponema brevicornis</i>
jellyfish	<i>Liriope tetraphylla</i>
white plumed anemone	<i>Metridium farcimen</i>
clonal plumose anemone	<i>Metridium senile</i>
siphonophore	<i>Muggiaea atlantica</i>
siphonophore	<i>Nanomia bijuga</i>
coral	<i>Oculina profunda</i>
anemone	<i>Paractinostola faeculenta</i>
cup coral	<i>Paracyathus stearnsii</i>
primnoid coral	<i>Parastenella</i>
purple-striped jelly	<i>Pelagia colorata</i>
Crown jellyfish	<i>Periphylla periphylla</i>
primnoid coral	<i>Plumarella longispina</i>
sea pen	<i>Ptilosarcus gurneyi</i>
siphonophore	<i>Sphaeronectes gracilis</i>
lace coral	<i>Stylanthea porphyra</i>
California hydrocoral	<i>Stylaster californicus</i>
lace coral	<i>Stylaster venustus</i>
sea pen	<i>Stylatula gracilis</i>
siphonophore	<i>Sulculeolaria biloba</i>
red gorgonian coral	<i>Swiftia kofoidi</i>
jellyfish	<i>Tetraplatia volitans</i>
anemone	<i>Urticina lofotensis</i>
fish-eating anemone	<i>Urticina piscivora</i>

Invertebrates	
COMMON NAME	SCIENTIFIC NAME
by-the-wind sailor	<i>Verella verella</i>
siphonophore	<i>Vogtia pentacantha</i>
	Annelida
polychaete worm	<i>Arctonoe fragilis</i>
polychaete worm	<i>Arctonoe vittata</i>
polychaete worm	<i>Bispira volutacornis</i>
polychaete worm	<i>Eudistylia polymorpha</i>
polychaete worm	<i>Eulalia bilineata</i>
polychaete worm	<i>Eunice multipectinata</i>
polychaete worm	<i>Eunice vittata</i>
polychaete worm	<i>Eunoe barbata</i>
polychaete worm	<i>Eunoe senta</i>
polychaete worm	<i>Euphrosine arctia</i>
polychaete worm	<i>Euphrosine dumosa</i>
polychaete worm	<i>Ficopomatus enigmaticus</i>
polychaete worm	<i>Genetyllis castanea</i>
polychaete worm	<i>Glycera tessellata</i>
polychaete worm	<i>Halosydna brevisetosa</i>
polychaete worm	<i>Harmothoe extenuata</i>
polychaete worm	<i>Harmothoe fragilis</i>
polychaete worm	<i>Harmothoe hirsuta</i>
polychaete worm	<i>Lepidasthenia longicirrata</i>
polychaete worm	<i>Lepidonotus caelorus</i>
polychaete worm	<i>Lepidonotus spiculus</i>
polychaete worm	<i>Lepidonotus squamatus</i>
polychaete worm	<i>Lumbrineris inflata</i>
polychaete worm	<i>Lumbrineris japonica</i>
polychaete worm	<i>Lumbrineris latreilli</i>
polychaete worm	<i>Nereiphylla castanea</i>
polychaete worm	<i>Nereis eakini</i>
polychaete worm	<i>Nereis pelagica</i>
polychaete worm	<i>Pholoides asperus</i>
polychaete worm	<i>Phyllochaetopterus prolifica</i>
polychaete worm	<i>Platynereis magalhaensis</i>
polychaete worm	<i>Polydora alloporis</i>
polychaete worm	<i>Rhynchonerella angelini</i>
polychaete worm	<i>Serpula columbiana</i>
polychaete worm	<i>Serpula vermicularis</i>
polychaete worm	<i>Sige bifoliata</i>
polychaete worm	<i>Syllis armillaris</i>
polychaete worm	<i>Tomopteris cavalli</i>
polychaete worm	<i>Tomopteris pacifica</i>

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Invertebrates	
COMMON NAME	SCIENTIFIC NAME
polychaete worm	<i>Tomopteris septentrionalis</i>
polychaete worm	<i>Trypanosyllis aeolis</i>
polychaete worm	<i>Trypanosyllis intermedia</i>
polychaete worm	<i>Vanadis longissima</i>
	Mollusca
squid	<i>Abraliopsis felis</i>
divaricate nutclam	<i>Acila castrensis</i>
corded white limpet	<i>Acmaea funiculata</i>
whitecap limpet	<i>Acmaea mitra</i>
harp baby-bubble	<i>Acteocina harpa</i>
gastropod	<i>Alvania almo</i>
gastropod	<i>Alvania compacta</i>
gastropod	<i>Alvania dinora</i>
Santa Rosa alvania	<i>Alvania purpurea</i>
gastropod	<i>Alvania rosana</i>
two-tone amphissa	<i>Amphissa bicolor</i>
wrinkled amphissa	<i>Amphissa columbiana</i>
variegate amphissa	<i>Amphissa versicolor</i>
lyre scissurelle	<i>Anatoma lyra</i>
Pacific sea-lemon	<i>Anisodoris nobilis</i>
Peruvian jingle	<i>Anomia peruviana</i>
	<i>Argopecten irradians</i>
bivalve	<i>concentricus</i>
nudibranch	<i>Armina cordellensis</i>
acute barleynail	<i>Barleeia acuta</i>
gastropod	<i>Bathybembix bairdii</i>
magister armhook squid	<i>Berryteuthis magister</i>
gastropod	<i>Bittiolium alternatum</i>
ribbed trophon	<i>Boreotrophon multicostatus</i>
turban whelk	<i>Buccinum viridum</i>
modest cadlina	<i>Cadlina modesta</i>
California caecum	<i>Caecum californicum</i>
many-named caecum	<i>Caecum crebricinctum</i>
western caecum	<i>Caecum occidentale</i>
purple-ring topsnail	<i>Calliostoma annulatum</i>
channeled topsnail	<i>Calliostoma canaliculatum</i>
blue topsnail	<i>Calliostoma ligatum</i>
granulose topsnail	<i>Calliostoma supragranosum</i>
chiton	<i>Callistochiton palmulatus</i>
gastropod	<i>Cancellaria cooperii</i>
gastropod	<i>Carinaria japonica</i>
three-tooth cavoline	<i>Cavolinia tridentata</i>
foliate thornmouth	<i>Ceratostoma foliatum</i>

Invertebrates	
COMMON NAME	SCIENTIFIC NAME
secret jewelbox	<i>Chama arcana</i>
California venus	<i>Chione californiensis</i>
squid	<i>Chiroteuthis calyx</i>
squid	<i>Chiroteuthis veranyi</i>
spiny scallop	<i>Chlamys hastata</i>
reddish scallop	<i>Chlamys rubida</i>
gastropod	<i>Clathromangelia interfossa</i>
pyramid clio	<i>Clio pyramidata</i>
sea angle	<i>Clione limacina</i>
yellow limpet	<i>Collisella ochracea</i>
oblique whelk	<i>Colus aphelus</i>
gastropod	<i>Colus trophius</i>
Atlantic corolla	<i>Corolla calceola</i>
spectacular corolla	<i>Corolla spectabilis</i>
hood puncturella	<i>Cranopsis cucullata</i>
giant rock-scallop	<i>Crassadoma gigantea</i>
cross-sculpture crenella	<i>Crenella decussata</i>
pacific half-slippersnail	<i>Crepipatella lingulata</i>
bumpy cyclocardia	<i>Cyclocardia bailyi</i>
stout cyclocardia	<i>Cyclocardia ventricosa</i>
Santa Barbara glass-scallop	<i>Cyclopecten barborensis</i>
gastropod	<i>Cymakra aspera</i>
gastropod	<i>Cymakra gracilior</i>
bivalve	<i>Delectopecten tillamookensis</i>
Vancouver scallop	<i>Delectopecten vancouverensis</i>
gastropod	<i>Desmopterus papilio</i>
California paperbubble	<i>Diaphana californica</i>
ringed doris	<i>Diaulula sandiegensis</i>
neat-rib keyhole limpet	<i>Diodora arnoldi</i>
rough keyhole limpet	<i>Diodora aspera</i>
orb diplodon	<i>Diplodonta orbella</i>
gastropod	<i>Dolichupis ritteri</i>
Humbolt squid	<i>Dosidicus gigas</i>
gastropod	<i>Epitonium indianorum</i>
gastropod	<i>Epitonium tinctum</i>
appleseed erato	<i>Erato vitellina</i>
gastropod	<i>Euspira lewisii</i>
Spanish shawl	<i>Flabellina iodinea</i>
painted spindle	<i>Fusinus luteopictus</i>
Oregon triton	<i>Fusitriton oregonensis</i>
squid	<i>Galiteuthis phyllura</i>
California sunsetclam	<i>Gari californica</i>

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COMMON NAME	SCIENTIFIC NAME
gritty doris	<i>Geitodoris heathi</i>
triangular marginella	<i>Gibberula subtrigona</i>
Ford venus	<i>Globivenus fordii</i>
california bittersweet	<i>Glycymeris subobsoleta</i>
gastropod	<i>Glyphostoma canfieldi</i>
squid	<i>Gonatopsis borealis</i>
clawed armhook squid	<i>Gonatus onyx</i>
pear marginella	<i>Granulina margaritula</i>
Chenu mussel	<i>Gregariella chenui</i>
pinto abalone	<i>Haliotis kamtschatkana</i>
chiton	<i>Hanleyella oldroydi</i>
hermissenda	<i>Hermisenda crassicornis</i>
pigeon erato	<i>Hespererato columbella</i>
Arctic hiatella	<i>Hiatella arctica</i>
squid	<i>Histioteuthis hoylei</i>
berry dwarf-turban	<i>Homalopoma baculum</i>
gastropod	<i>Homalopoma berryi</i>
gastropod	<i>Homalopoma lacunatum</i>
dark dwarf-turban	<i>Homalopoma luridum</i>
gastropod	<i>Homalopoma mimicum</i>
few-rib dwarf-turban	<i>Homalopoma paucicostatum</i>
rayed dwarf-turban	<i>Homalopoma radiatum</i>
Kennerley venus	<i>Humilaria kennerleyi</i>
gastropod	<i>Iothia lindbergi</i>
lamellar venus	<i>Irusella lamellifera</i>
suborbicular kellyclam	<i>Kellia suborbicularis</i>
gastropod	<i>Kurtziella beta</i>
San Diego lamellaria	<i>Lamellaria diegoensis</i>
San Diego scallop	<i>Leopecten diegensis</i>
chiton	<i>Lepidochitona flectens</i>
chiton	<i>Lepidozona radians</i>
chiton	<i>Lepidozona retiporosa</i>
chiton	<i>Lepidozona scabricostata</i>
chiton	<i>Lepidozona willetti</i>
chiton	<i>Leptochiton alveolus</i>
chiton	<i>Leptochiton belknapi</i>
chiton	<i>Leptochiton rugatus</i>
helcid pteropod	<i>Limacina helicina</i>
Hemphill fileclam	<i>Limaria hemphilli</i>
sharp-rib lirularia	<i>Lirularia acuticostata</i>
few-spot lirularia	<i>Lirularia parcipicta</i>
feather datemussel	<i>Lithophaga plumula</i>
california market squid	<i>Loligo opalescens</i>
bivalve	<i>Lucinoma annulata</i>

Invertebrates	
COMMON NAME	SCIENTIFIC NAME
Farallon cyclostreme	<i>Macrarena farallonensis</i>
california macromphaline	<i>Macromphalina californica</i>
pacific rosy margarite	<i>Margarites rhodia</i>
salmon margarite	<i>Margarites salmoneus</i>
gastropod	<i>Megatebennus bimaculatus</i>
auburn eulima	<i>Melanella rutila</i>
gastropod	<i>Melanella thersites</i>
gastropod	<i>Metaxia convexa</i>
short baby-bubble	<i>Microglyphis brevicula</i>
tiny pouchclam	<i>Milneria minima</i>
elongate carditid	<i>Miodontiscus prolongatus</i>
half-pitted miter	<i>Mitra idae</i>
variegated dovesnail	<i>Mitrella tuberosa</i>
gastropod	<i>Mitromorpha gracilior</i>
fat horsemussel	<i>Modiolus capax</i>
California horsemussel	<i>Modiolus carpenteri</i>
bag horsemussel	<i>Modiolus sacculifer</i>
nudibranch	<i>Montereina nobilis</i>
chiton	<i>Mopalia egretta</i>
chiton	<i>Mopalia imporcata</i>
robust clubhook squid	<i>Moroteuthis robusta</i>
California mussel	<i>Mytilus zonarius</i>
smooth western nassa	<i>Nassarius insculptus</i>
gastropod	<i>Nassarius mendicus</i>
hundred-line cockle	<i>Nemocardium centifilosum</i>
gastropod	<i>Neptunea amianta</i>
purple rocksnail	<i>Ocinebrina atropurpurea</i>
gastropod	<i>Ocinebrina interfossa</i>
lurid rocksnail	<i>Ocinebrina lurida</i>
squid	<i>Octopoteuthis deletron</i>
North Pacific bigeye octopus	<i>Octopus californicus</i>
North Pacific giant octopus	<i>Octopus dofleini</i>
smoothskin octopus	<i>Octopus leioderma</i>
East Pacific red octopus	<i>Octopus rubescens</i>
beatic dwarf olive	<i>Olivella baetica</i>
red flying squid	<i>Ommastrephes bartramii</i>
boreal clubhook squid	<i>Onychoteuthis borealijaponicus</i>
octopus	<i>Opisthoteuthis californiana</i>
sharp-rib cyclostreme	<i>Parviturbo acuticostatus</i>
California pedicularia	<i>Pedicularia californica</i>

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Invertebrates	
COMMON NAME	SCIENTIFIC NAME
Monterey wormsnail	<i>Petalococonchus montereyensis</i>
California petricolid	<i>Petricola californiensis</i>
chiton	<i>Placiphorella atlantica</i>
gastropod	<i>Pleurobranchaea californica</i>
alaska jingle	<i>Pododesmus macrochisma</i>
red turban	<i>Pomaulax gibberosus</i>
Pacific jewelbox	<i>Pseudochama exogyra</i>
deep jewelbox	<i>Pseudochama granti</i>
frill-wing murex	<i>Pteropurpura macroptera</i>
hood puncturella	<i>Puncturella cucullata</i>
dot-rib puncturella	<i>Puncturella punctocostata</i>
gastropod	<i>Rictaxis punctocaelatus</i>
gastropod	<i>Rissoina hannai</i>
gastropod	<i>Rissoina newcombei</i>
North Pacific bobtail squid	<i>Rossia pacifica</i>
elegant emarginula	<i>Scelidotoma bella</i>
gastropod	<i>Seila montereyensis</i>
rose-painted semele	<i>Semele rubropicta</i>
sharp-rib semele	<i>Semele venusta</i>
scaled wormsnail	<i>Serpulorbis squamiger</i>
rim scissurelle	<i>Sinezona rimuloides</i>
lovely pacific solarelle	<i>Solariella peramabilis</i>
black tegula	<i>Tegula funebris</i>
lined chiton	<i>Tonicella lineata</i>
fat gaper	<i>Tresus capax</i>
San Pedro triphora	<i>Triphora pedroana</i>
rosy tritonia	<i>Tritonia diomedea</i>
california trivium	<i>Trivia californiana</i>
gastropod	<i>Trivia ritteri</i>
gastropod	<i>Trophonopsis stuarti</i>
vampire squid	<i>Vampyroteuthis infernalis</i>
granular lamellaria	<i>Velutina granulata</i>
smooth lamellaria	<i>Velutina velutina</i>
shield false limpet	<i>Williamia peltoides</i>
	Arthropoda
spiny lithode crab	<i>Acantholithodes hispidus</i>
copepod	<i>Acartia danae</i>
copepod	<i>Acartia hudsonica</i>
copepod	<i>Acartia longiremis</i>
copepod	<i>Acartia tonsa</i>
copepod	<i>Aetideus bradyi</i>
copepod	<i>Aetideus divergens</i>

Invertebrates	
COMMON NAME	SCIENTIFIC NAME
Mysid shrimp	<i>Alienacanthomysis macropsis</i>
twistclaw pistol shrimp	<i>Alpheus clamator</i>
copepod	<i>Arietellus plumifer</i>
copepod	<i>Arietellus setosus</i>
barnacles	<i>Armatobalanus nefrens</i>
copepod	<i>Augaptilus glacialis</i>
barnacles	<i>Balanus nubilus</i>
Burkenroad blunt-tail shrimp	<i>Bentheogennema burkenroadi</i>
spiny mole crab	<i>Blepharipoda occidentalis</i>
amphipod	<i>Brachyscelus crusculum</i>
copepod	<i>Bradyidius similis</i>
copepod	<i>Calanus marshallae</i>
copepod	<i>Calanus pacificus</i>
copepod	<i>Caligus clemensi</i>
copepod	<i>Caligus macarovi</i>
copepod	<i>Calocalanus pavo</i>
copepod	<i>Calocalanus pavoninus</i>
copepod	<i>Calocalanus styliremis</i>
Pacific rock crab	<i>Cancer antennarius</i>
Dungeness crab	<i>Cancer magister</i>
pygmy rock crab	<i>Cancer oregonensis</i>
red rock crab	<i>Cancer productus</i>
copepod	<i>Candacia bipinnata</i>
copepod	<i>Candacia columbiae</i>
green crab	<i>Carcinus maenas</i>
copepod	<i>Centropages abdominalis</i>
copepod	<i>Centropages bradyi</i>
grooved Tanner crab	<i>Chionoecetes tanneri</i>
longhorn decorator crab	<i>Chorilia longipes</i>
copepod	<i>Clausocalanus arcuicornis</i>
copepod	<i>Clausocalanus furcatus</i>
copepod	<i>Clausocalanus lividus</i>
copepod	<i>Clausocalanus parapergens</i>
ostracod	<i>Conchoecetta acuminata</i>
ostracod	<i>Conchoecia macrocheira</i>
ostracod	<i>Conchoecia magna</i>
ostracod	<i>Conchoecilla daphnoides</i>
copepod	<i>Corycaeus anglicus</i>
copepod	<i>Corycaeus flaccus</i>
bay shrimp	<i>Crangon nigromaculata</i>
copepod	<i>Ctenocalanus vanus</i>
ostracod	<i>Discoconchoecia elegans</i>

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Invertebrates	
COMMON NAME	SCIENTIFIC NAME
amphipod	<i>Elasmopus antennatus</i>
Pacific sand crab	<i>Emerita analoga</i>
copepod	<i>Epilabidocera amphitrites</i>
striped eualid	<i>Eualus lineatus</i>
copepod	<i>Eucalanus bungii</i>
copepod	<i>Eucalanus californicus</i>
copepod	<i>Eucalanus hyalinus</i>
copepod	<i>Euchaeta elongata</i>
copepod	<i>Euchaeta media</i>
copepod	<i>Euchirella curticauda</i>
copepod	<i>Euchirella grandicornis</i>
copepod	<i>Euchirella pseudopulchra</i>
copepod	<i>Euchirella rostrata</i>
krill	<i>Euphausia pacifica</i>
krill	<i>Euphausia recurva</i>
grooved mussel crab	<i>Fabia subquadrata</i>
copepod	<i>Gaetanus minor</i>
copepod	<i>Gaetanus pungens</i>
copepod	<i>Haloptilus longicornis</i>
furry crab	<i>Hapalogaster cavicauda</i>
purple shore crab	<i>Hemigrapsus nudus</i>
barred shrimp	<i>Heptacarpus pugettensis</i>
slender coastal shrimp	<i>Heptacarpus tenuissimus</i>
copepod	<i>Heterorhabdus papilliger</i>
copepod	<i>Heterorhabdus tanneri</i>
copepod	<i>Heterostylites longicornis</i>
Mysid shrimp	<i>Holmesiella anomala</i>
amphipod	<i>Hyperia medusarum</i>
amphipod	<i>Hyperoche mediterranea</i>
amphipod	<i>Hyperoche medusarum</i>
Mysid shrimp	<i>Inusitatomysis insolita</i>
isopod	<i>Janiralata occidentalis</i>
isopod	<i>Joeropsis dubia</i>
isopod	<i>Joeropsis dubia dubia</i>
tanaid	<i>Leptochelia savignyi</i>
amphipod	<i>Leucothoe spinicarpa</i>
scarlet king crab	<i>Lithodes couesi</i>
brown box crab	<i>Lopholithodes foraminatus</i>
blackclaw crestleg crab	<i>Lophopanopeus bellus</i>
copepod	<i>Lophothrix frontalis</i>
moss crab	<i>Loxorhynchus crispatus</i>
sheep crab	<i>Loxorhynchus grandis</i>
copepod	<i>Lucicutia flavicornis</i>
copepod	<i>Lucicutia longicornis</i>

Invertebrates	
COMMON NAME	SCIENTIFIC NAME
amphipod	<i>Lycaea pulex</i>
copepod	<i>Mecynocera tenuis</i>
barnacle	<i>Megabalanus californicus</i>
copepod	<i>Mesocalanus tenuicornis</i>
copepod	<i>Metridia pacifica</i>
ostracod	<i>Mikroconchoecia acuticosta</i>
squat lobster	<i>Munida quadrispina</i>
isopod	<i>Munna spinifrons</i>
isopod	<i>Munna stephensi</i>
krill	<i>Nematobranchion flexipes</i>
krill	<i>Nematoscelis difficilis</i>
copepod	<i>Neocalanus cristatus</i>
copepod	<i>Neocalanus plumchrus</i>
krill	<i>Nyctiphanes simplex</i>
copepod	<i>Oithona atlantica</i>
copepod	<i>Oithona similis</i>
amphipod	<i>Opisa tridentata</i>
graceful decorator crab	<i>Oregonia gracilis</i>
ostracod	<i>Orthoconchoecia striola</i>
amphipod	<i>Oxycephalus clausi</i>
left handed hermit crab	<i>Paguristes ulreyi</i>
knobbyhand hermit	<i>Pagurus confragosus</i>
sidestriped shrimp	<i>Pandalopsis dispar</i>
dock shrimp	<i>Pandalus danae</i>
humpy shrimp	<i>Pandalus goniurus</i>
coonstriped shrimp	<i>Pandalus hypsinotus</i>
ocean shrimp	<i>Pandalus jordani</i>
spot shrimp	<i>Pandalus platyceros</i>
roughpatch shrimp	<i>Pandalus stenolepis</i>
yellowleg pandalid	<i>Pandalus tridens</i>
copepod	<i>Paracalanus indicus</i>
copepod	<i>Paracalanus parvus</i>
California king crab	<i>Paralithodes californiensis</i>
Spiny king crab	<i>Paralithodes rathbuni</i>
amphipod	<i>Paraphronima crassipes</i>
amphipod	<i>Paraphronima gracilis</i>
copepod	<i>Pareucalanus parki</i>
Pacific glass shrimp	<i>Pasiphaea pacifica</i>
crimson pasiphaeid	<i>Pasiphaea tarda</i>
amphipod	<i>Phronima sedentaria</i>
amphipod	<i>Phronimopsis spinifera</i>
armed box crab	<i>Platymera gaudichaudii</i>
copepod	<i>Pleuromamma borealis</i>

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Invertebrates	
COMMON NAME	SCIENTIFIC NAME
copepod	<i>Pleuromamma quadrungulata</i>
copepod	<i>Pleuromamma robusta</i>
copepod	<i>Pleuromamma scutullata</i>
copepod	<i>Pleuromamma xiphias</i>
pelagic red crab	<i>Pleuroncodes planipes</i>
amphipod	<i>Primno abyssalis</i>
amphipod	<i>Primno brevidens</i>
copepod	<i>Pseudocalanus mimus</i>
copepod	<i>Pseudocalanus minutus</i>
copepod	<i>Pseudocalanus moultoni</i>
graceful kelp crab	<i>Pugettia gracilis</i>
cryptic kelp crab	<i>Pugettia richii</i>
copepod	<i>Racovitzanus antarcticus</i>
copepod	<i>Rhincalanus nasutus</i>
copepod	<i>Sapphirina nigromaculata</i>
amphipod	<i>Scina nana</i>
copepod	<i>Scolecithricella minor</i>
copepod	<i>Scolecithricella ovata</i>
copepod	<i>Scolecithrix bradyi</i>
copepod	<i>Scolecithrix danae</i>
copepod	<i>Scottocalanus persecans</i>
sharpnose crab	<i>Scyra acutifrons</i>
prawn	<i>Sergestes similis</i>
barnacle	<i>Solidobalanus engbergi</i>
offshore blade shrimp	<i>Spirontocaris sica</i>
amphipod	<i>Streetsia challengerii</i>
Grady's cave amphipod	<i>Stygobromus gradyi</i>
krill	<i>Stylocheiron abbreviatum</i>
krill	<i>Stylocheiron longicorne</i>
littoral pistol shrimp	<i>Synalpheus lockingtoni</i>
krill	<i>Tessarabrachion oculatum</i>
amphipod	<i>Themisto pacifica</i>
krill	<i>Thysanoessa gregaria</i>
krill	<i>Thysanoessa inspinata</i>
krill	<i>Thysanoessa spinifera</i>
copepod	<i>Tortanus discaudatus</i>
copepod	<i>Triconia conifera</i>
amphipod	<i>Tryphana malmi</i>
copepod	<i>Undeuchaeta intermedia</i>
copepod	<i>Undeuchaeta plumosa</i>
isopod	<i>Uromunna ubiquita</i>
amphipod	<i>Vibilia armata</i>
Amphipod	<i>Vibilia australis</i>
Amphipod	<i>Vibilia stebbingi</i>

ALGAE

The algae species list was compiled from collections from Cordell Expedition SCUBA divers. None of the species are listed as threatened or endangered under the Endangered Species Act.

Algae
<i>SCIENTIFIC NAME</i>
<u>Chlorophyta</u>
<i>Derbesia marina</i>
<i>Ostreobium quekettii</i>
<i>Ulvella viridis</i>
<u>Rhodophyta</u>
<i>Acrochaetium sp.</i>
<i>Antithamnion defectum</i>
<i>Antithamnion kyllinii</i>
<i>Antithamnionella spirographidis</i>
<i>Asterocolax gardneri</i>
<i>Botryocladia sp.</i>
<i>Callithamnion biseriatum</i>
<i>Callophyllis heanophylla</i>
<i>Callophyllis rhynchocarpa</i>
<i>Corallinaceae sp.</i>
<i>Delesseriaceae sp.</i>
<i>Erythrocladia irregularis</i>
<i>Fosliella sp.</i>
<i>Leptofauchea pacifica</i>
<i>Maripelta rotata</i>
<i>Meiodiscus concrescens</i>
<i>Membranoptera platyphylla</i>
<i>Minium parvum</i>
<i>Opuntiella californica</i>
<i>Platysiphonia decumbens</i>
<i>Pleonosporium squarrulosum</i>
<i>Polyneura latissima</i>
<i>Porphyropsis coccinea</i>
<i>Pterothamnion heteromorphum</i>
<i>Pugetia fragilissima</i>
<i>Rhodymenia hancockii</i>
<i>Rhodymeniales sp.</i>
<i>Rubrointrusa membranacea</i>
<i>Weeksia sp.</i>

