RESOURCE PROTECTION ACTION PLAN

Overview

This programmatic action plan prescribes a framework for identifying and addressing current and future Sanctuary resource protection issues. It also documents issues the Sanctuary is currently tracking, and describes the tools CINMS staff will apply to address such issues. With an ecosystem-based approach to management, including a research program that informs resource protection, CINMS examines and evaluates existing and potential resource management issues that may affect the Sanctuary. This approach requires that CINMS staff accurately identify, research, and assess the significance of new issues and threats, and provide for ongoing tracking of such issues. With timely and proper issue assessment and analysis, appropriate actions can be taken by the Sanctuary to reduce the potential for negative impacts on CINMS resources and qualities, and to maintain the public's appropriate use and enjoyment of the Sanctuary.

Description of the Issues

In addition to the wide range of issues discussed in other action plans, this action plan focuses on current and emerging resource protection issues. "Emerging" resource protection issues for CINMS may include: a) issues that have already arisen in the Sanctuary and/or surrounding region that have to date had relatively small impacts, but could grow to have large impacts in the future, and b) issues that have arisen in other coastal and marine areas but have not yet appeared in the Sanctuary. Sanctuary staff will also use the framework herein to address resource protection issues that are currently unknown or unforeseen, but which may emerge in the future due to technological advances, changes in operations, growing population sizes, or other factors.

CINMS staff attention and responsiveness to current and emerging resource protection issues has increased over time, especially over the last ten years. Such improvements have resulted from increases in staffing levels, improved monitoring of and knowledge about the ecosystems, greater public awareness of the Sanctuary, and the 1998 formation of the Sanctuary Advisory Council. CINMS strives to learn about, track, analyze, and respond to current and emerging resource protection issues. Ultimately, improved responsiveness to new issues will help head off potential negative consequences to Sanctuary resources.

There are a number of known issues that, while not yet impacting the Sanctuary, could emerge as significant concerns for CINMS. Other known issues may be affecting Sanctuary resources or qualities, but require additional research or monitoring before such impacts can be known. Monitoring programs outlined in Strategy CS.3 provide information about the status of resources and the effects of current and emerging issues. In other cases, the Sanctuary develops new partnerships and programs in response to emerging issues. The Sanctuary Advisory Council and Research Activities Panel are two groups that bring issues to the attention of CINMS staff and help evaluate the level of threats once emerging issues are identified. Below is a partial list of several issues the Sanctuary is currently aware of, each of which may emerge more fully in the future. However, there are many other issues, either partly known or wholly unforeseen which are not listed here.

Aquaculture

Aquaculture is generally described as the raising of fish or shellfish subject to some controls in ponds, pens, tanks or other containers (Leet *et al*. 2001). The primary goal of many hatchery programs is to either a) create a positive economic or conservation effect through enhancing the numbers of a

commercially valuable species or b) rejuvenate a species considered rare, threatened or endangered. Aquaculture regulations within state waters are promulgated by the California Fish and Game Commission.

Aquaculture containment facilities may be located within or separate from natural marine and aquatic environments. Hatcheries are a particular type of aquaculture facility typically used to rear marine organisms for subsequent intentional release into the environment. The California Department of Fish and Game's Ocean Resources Enhancement and Hatchery Program facilities in Carlsbad rear white seabass and California halibut and are researching the potential for rearing giant sea bass, all of which occur naturally within the Sanctuary (Leet *et al*. 2001).

Since aquaculture operations have the potential to impact resources and qualities beyond their immediate environs, including by releasing hatchery-raised organisms into the area, operations adjacent to and within the Sanctuary region may impact Sanctuary resources and qualities. For example, aquaculture operations may disturb the seabed or introduce disease pathogens, chemicals (such as algicides and antibiotics) and/or introduced species (Kay and Alder 1999).

Aquaculture facilities do not presently occur within the CINMS boundary, and would likely be precluded from operating under Sanctuary regulations, but several facilities occur within the study area. 85% of mussel aquaculture production and 91% of abalone aquaculture production in the State of California occurs along the mainland adjacent to the study area ([California] Resources Agency of California 1997). In 1998, California aquaculture facilities produced 256,000 pounds of mussels (down from a high of 471,000 in 1997), and 162,000 pounds of abalone (Leet *et al*. 2001). The Ecomar company collects naturally settled mussels and other invertebrates from several oil and gas structures in the study area. Potential future developments in regional aquaculture may include in-situ ocean-based abalone aquaculture facilities as well as oyster aquaculture. In addition, in 2003, the Hubbs-SeaWorld Research Institute announced plans to pursue permitting approvals for installation of a finfish and shellfish aquaculture facility at Platform Grace, an offshore oil platform adjacent to the eastern boundary of CINMS. However, the Research Institute's lease with platform owner Venoco has since expired and not been renewed.

In 2007, the Advisory Council's Conservation Working Group developed a comprehensive report on open ocean aquaculture that included recommendations for CINMS staff should aquaculture projects be proposed near CINMS (Conservation Working Group 2007). The Sanctuary Advisory Council adopted the report in July 2007, and it is available online at http://channelislands.noaa.gov/sac/pdf/7-27-07.pdf. Sanctuary staff will utilize strategies RP.1 and RP.2 to track and respond to aquaculture issues, and to address the Sanctuary Advisory Council aquaculture recommendations. Four major areas of potential impact to Sanctuary resources, and uses associated with them, are identified and explored in the report: 1) food web impacts from raising predator species; 2) biological pollution from the escape of farmed fish and the spread of parasites and disease; 3) discharges of fish farm emissions that could degrade CINMS water quality and harm biological communities; and 4) degradation of marine habitat: attraction, underwater noise and entanglements. The report's technical information and ten recommendations (see text box) will provide CINMS staff with importance guidance should open ocean aquaculture be proposed within or near the Sanctuary.

Open Ocean Aquaculture in the Santa Barbara Channel: An emerging challenge for the Channel Islands National Marine Sanctuary (adopted by the Sanctuary Advisory Council, 2007*)

Abridged List of Report Recommendations:

1. Support ecologically, economically and socially sustainable use of wild fish inputs for proposed fish farm operations, and advance disclosure of feed sources and impact analysis on feed production. In addition, support research and sound management of California coastal pelagic species.

2. Oppose proposed farming of non-indigenous or genetically modified (GM) aquatic plant and animal species (including specimens of non-local genetic stock) in the Santa Barbara Channel.

3. To protect wild stocks from the spread of parasites and pathogens associated with commercial fish farming, evaluate open ocean aquaculture facility proposals with specific, science based criteria for the maximization of the health of farmed fish, and the minimization of potential for the facilities to act as pathogen and parasite incubators.

4. Should support current and potential future aquaculture approaches that minimize water quality degradation from untreated discharges often associated with fish farming. Require that during environmental review, fish farm applicants 1) demonstrate that fish farm discharges won't impair CINMS water quality, and 2) analyze and disclose potential cumulative impacts to CINMS-area resources from fish farm proliferation and other factors.

5. Best available technologies and deliberate siting of aquaculture facilities should be required to minimize entanglement, migration disruption, attraction, and habitat abandonment.

6. Be resolved that any future aquaculture facilities in the Santa Barbara Channel region be sited deliberately, based on specific, science-based criteria, and robust data demonstrating that the chosen location is optimal for avoiding or minimizing adverse effects on Channel and Sanctuary resources and uses, rather than sited opportunistically based solely on the existence of useful infrastructure.

7. Actively participate in federal policy development and rulemaking on aquaculture, and leverage existing research and policy recommendations to influence these federal processes to ensure protection of natural resources, existing uses, and goals of the local Sanctuary management and the National Marine Sanctuary Program.

8. Adopt the Sanctuary regulatory updates comprising Proposed Actions 3, 4, and 12 of the Draft Management Plan/Draft Environmental Impact Statement.

9. Acknowledge California's current leadership in marine fin fish aquaculture management, support and leverage the State's existing standards for aquaculture siting, operations, and reclamation, and, in the absence of a federal framework, generally encourage extension of the state's standards and policies as established by the Sustainable Oceans Act into the federal waters of the EEZ.

10. Participate, consult and comment directly in the permitting processes for any future Santa Barbara Channel region aquaculture facility proposals. Concurrently, the Sanctuary Advisory Council should uphold its general mandate by reviewing application materials for future fin fish aquaculture proposals and formally advising CINMS staff.

* Full report available at http://channelislands.noaa.gov/sac/pdf/7-27-07.pdf

Artificial Reefs

The NMSP artificial reef policy statement[44] defines artificial reef development as:

> …the act of deliberately placing any material or matter in an area of the marine environment where that structure does not exist under natural circumstances for the purpose of protecting, regenerating, concentrating or increasing populations of living marine resources, or for enhanced recreational, commercial, or educational use of the area.

CINMS regulations preclude installation of an artificial reef without a Sanctuary permit issued by the NMSP. Sanctuary permits are only issued if the permit application/proposed activity meets the CINMS permit issuance criteria provided at 15 CFR 922.74, and the criteria contained in the NMSP's artificial reef policy statement permitting guidelines.[45] In summary, CINMS permit regulations indicate that in order to be issued a permit, among other things, the NMSP must find that the otherwise prohibited activity is appropriate research, will further the educational value of the Sanctuary, will further salvage or recovery operations, or will assist in managing the Sanctuary.

There has been interest in converting decommissioned oil and gas platforms in the Santa Barbara Channel to artificial reefs, through the MMS "rigs-to-reefs" program. Should any oil and gas platforms in the Channel be decommissioned, proponents of rigs-to-reefs suggest using all or part of these platforms for artificial reefs instead of removing them. There are currently no proposals to place artificial reefs in the Sanctuary as part of the "rigs-to-reefs" program or otherwise. As part of a future EIS process for Sanctuary boundary evaluation (see Strategy BE.1), which will include assessing areas in which there are currently oil and gas platforms, NOAA will consider the issue of decommissioning oil and gas platforms and potential artificial reef proposals associated with them.

Energy Development

The Santa Barbara Channel has been a center of energy development since oil was first successfully developed in Summerland in the late 1800s, and today there is interest in using the area to develop and facilitate the use of other energy sources. Contemporary oil and gas exploration, development, and production are described in The Human Setting section of this management plan, and in the Affected Environment section of the FEIS, while Sanctuary activities aimed at addressing oil and hazardous spills are described in the Emergency Response & Enforcement Action Plan. CINMS uses the strategies in this action plan to identify, assess, and address any energy development issues as they arise, including working with the relevant permitting authorities to review and address any energy development project that has the potential to destroy, injure, or cause the loss of Sanctuary resources or qualities.

In addition to conventional oil and gas activities, in recent years the Santa Barbara Channel has been under consideration as a site for liquefied natural gas (LNG) terminals. The U.S. Coast Guard, Maritime Administration, and the California State Lands Commission are the federal and state agencies with principal authority for permitting LNG terminals in the region. In 2007, the permitting agencies announced the preparation of a Draft EIS/EIR for the review of a Clearwater Port Deepwater Port application for a deepwater port license to construct and operate a natural gas deepwater port off Platform Grace within three nmi of the Sanctuary's northern boundary. NOAA has followed the Clearwater Port Deepwater Port application since 2006 and has submitted several sets of comments on the proposed

[44] The NMSP artificial reef policy statement and permitting guidelines document is available online at: http://sanctuaries.noaa.gov/management/pdfs/arpolicy_071205.pdf.
[45] *Ibid*.

action. NOS' specific concerns regarding the potential impacts to CINMS resources and qualities can be summarized as follows:

1. Potential for collisions between marine mammals and LNG tankers, construction, and support vessels;
2. Impacts of sound on Sanctuary resources during construction and operation; and
3. Other project characteristics that might affect CINMS resources including light impacts, the proposed LNG vessels route, and discharges from LNG vessels.

Another LNG terminal proposed approximately twelve miles outside of the Sanctuary's southeastern border was denied the necessary state permits in 2007.

Several potentially viable sources of ocean-derived alternative energy are under exploration around the world, including: waves, tides, currents, and salinity and temperature differentials. Off the California coast there have been recent proposals for wind and wave energy. While no ocean-derived alternative energy projects have been proposed within CINMS, and it is unlikely that developing all of these potential energy sources would be viable in the Santa Barbara Channel region, ocean-derived alternative energy projects have been proposed in other national marine sanctuaries. The U.S. Energy Policy Act of 2005 (42 U.S.C. 15801 *et seq.*) grants the Minerals Management Service new responsibilities over federal offshore renewable energy and related-uses of the outer continental shelf.

Climate Change

Climate change is an issue of growing concern on global and local scales that has significant implications for marine resources. CINMS and the NMSP have adopted the meaning of climate change used by the Intergovernmental Panel on Climate Change (2007): "Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity." In 2007, the NMSP issued this climate change policy:[46]

> The NMSP is mandated by section 301 of the National Marine Sanctuaries Act (NMSA), to protect biological communities and natural habitats within sanctuaries, promote scientific research, enhance public awareness, and cooperate with global programs. The NMSP, therefore, will strive to address, to the best of our ability, and in cooperation with NOAA and other partners, the potential effects of global climate change on sanctuary resources.

The NMSP is working with NOAA's Climate Program Office (CPO) to assess the extent of climate change impacts on national marine sanctuary resources and how NOAA and the NMSP might help mitigate these impacts. CINMS and the NMSP are also examining ways in which to "green" operations (see Strategy OP.8 about greening CINMS facilities and operations). In addition to taking measures to reduce potential climate change impacts of its operations, using the activities outlined in this action plan and in the Conservation Science Action Plan (*e.g.*, Strategy CS.3 activity (5) that focuses on developing a carbon budget for the Sanctuary), CINMS staff will cooperate with and utilize the resources of the NMSP, NOAA, and other partners to identify, assess, and respond to issues associated with climate change in the Sanctuary.

[46] The NMSP climate change policy is part of a broader NMSP climate change policy statement that is available online at: http://sanctuaries.noaa.gov/management/pdfs/nmsp_climatepolicy.pdf.

Ocean Acidification

As with all Sanctuary resource protection issues, the Sanctuary Superintendent looks to the Sanctuary Advisory Council for advice and insight regarding potential climate change impacts on the Sanctuary and means of addressing them. The Sanctuary Advisory Council's ocean acidification report, prepared by the Conservation and Commercial Fishing working groups, is one such source of insight. This report provides an overview of scientific research on ocean acidification, examines the effects of rising atmospheric carbon dioxide levels on ocean chemistry, compiles information on known impacts of lowered pH on certain marine organisms, and discusses the potential ecosystem impacts of changing water chemistry in general and the implications of such changes for CINMS resources. Finally, the report offers a set of recommendations for CINMS staff, resource managers and stakeholders to: improve scientific understanding of ocean acidification in the Channel Islands region; form partnerships to better leverage existing research, management and pollution control assets; and, identify actions that CINMS managers and stakeholders can take to help reduce ocean acidification threats to CINMS resources and qualities. The Sanctuary will use the activities outlined in this and other action plans to consider these recommendations and how best to address them.

Eelgrass

Eelgrass (*Zostera* spp.), is a flowering marine plant that provides a highly productive and complex microhabitat supporting a wide variety of marine species. Eelgrass beds are known to be ecologically important for primary production, nutrient cycling, and substrate stabilization. Eelgrass has been found at ten locations within the Sanctuary in small beds at Anacapa, Santa Cruz and Santa Rosa islands, occurring at depths of 3 to 15 meters. Eelgrass is a NMFS-designated Essential Fish Habitat.

Eelgrass habitats can be vulnerable to oil spills, threatened by habitat disturbances from development (*e.g.*, changes in sediment runoff and water clarity, piers, moorings), and damaged or destroyed by cumulative impacts from boat anchors.

Since 2001 CINMS has supported the Santa Barbara ChannelKeeper in its successful efforts to transplant and restore historical eelgrass bed sites at Anacapa Island (Frenchy's Cove) and Santa Cruz Island (Little Scorpion Cove). CINMS will continue to work with ChannelKeeper and the Channel Islands National Park to track the status of existing and transplanted eelgrass beds, and to understand when this important habitat type is further threatened or in need of management intervention. For example, in 2008 a CINMS permit issuance to the Channel Islands National Park resulted in installation of sub-surface buoy floats on mooring chains at Santa Cruz Island, which significantly reduced the potential for scouring of adjacent eelgrass plants.

Human-induced Acoustic Impacts

Introduced sound in the ocean in the ocean comes from a variety of anthropogenic sources, and may have potential negative impacts on individual animals, and in turn upon local populations, species and ecosystems. CINMS is working with partners from the NMSP, NOAA Fisheries, and academia to gain a better understanding of the Sanctuary's ambient acoustic environment, and of potential noise impacts on Sanctuary resources. This work has been greatly informed through the work of the Sanctuary Advisory Council and its Conservation Working Group. In 2007, the NMSP issued a policy statement (available online at http://sanctuaries.noaa.gov/management/pdfs/nmsp_acousticspolicy.pdf) indicating that it will use the tools and authorities at its disposal to prevent and/or mitigate human-induced acoustic impacts on sanctuary resources.

In September 2004 the Sanctuary Advisory Council unanimously adopted a set of recommendations put forth by their Conservation Working Group advising the CINMS on how to begin addressing potential marine life impacts from anthropogenic noise sources such as large vessel traffic. Leading up to this

action, the Advisory Council took an educational approach to understanding this complex issue, and the Conservation Working Group developed a comprehensive report on the subject (Conservation Working Group 2004, available at: http://www.channelislands.noaa.gov/sac/pdf/7-12-04.pdf). The Advisory Council advised that progressive steps be taken with regard to promoting greater scientific understanding of the issue and investigating policy-based options for mitigating noise impacts. The recommendations call for increased research on noise sources and associated effects on marine life, investigation of partnership development between CINMS and other agencies and industries, and consideration of policy options for mitigating threats from noise sources such as large vessel traffic.

As documented in the Sanctuary Advisory Council's report on anthropogenic noise (Conservation Working Group 2004), researchers have found that sound that is short in duration but sufficiently loud, such as underwater explosions, pinging from tactical naval sonar, and air gun blasts from seismic surveying, can cause harmful to fatal physical damage to the organs and hearing tissues of certain marine life— particularly marine mammals and fishes— which suffer such exposure (Todd *et al.* 1996; Evans and England 2001; McCauley *et al.* 2003). Cumulative exposure to less intense sound over a longer duration, such as vessel traffic noise next to busy harbors, ports, or shipping lanes, can also cause temporary or permanent damage to hearing tissue in marine animals, as well as obscure, or mask,[47] biologically vital or important sound from predators, prey, mates or other members of an individual's species (Richardson *et al.* 1995). Other effects of noise may include altering migration patterns or abandoning important habitats, along with negative affects on energy and physiology of the animals (Ketten 1998; Scheifele 2000). According to the NRC (2003), masking is "One of the most pervasive and significant effects of a general increase in background noise on most vertebrates, including marine mammals…." Fish and invertebrates may experience noise impacts such as damage to eggs, reduced reproduction rates, and physiological or morphological damage (Lagardère 1982; Myrberg 1990; Hastings 1991).

CINMS has been working with several partners on this issue. In 2005 CINMS began initial discussions with the NOAA Fisheries' Office of Protected Resources Ocean Acoustics Program aimed at developing a partnership-based inquiry into many of the Advisory Council's recommendations. NOAA Fisheries implements regulations that prohibit take and harassment of marine mammals, along with take of other protected species. Activities that exceed a certain noise threshold are subject to rigorous review under the NOAA Fisheries permit authority, which includes mitigation measures when deemed necessary. CINMS consults with NOAA Fisheries during permitting processes on the application and enforcement of regulations to prevent undue harm to marine mammals in the Sanctuary. Another important role NOAA Fisheries has played is in sponsoring international symposia on ship quieting technology. Because the Stellwagen Bank National Marine Sanctuary staff have been actively working to improve the understanding of acoustics and acoustic impacts within their sanctuary, CINMS maintains an active dialogue and information sharing with them on this issue.

In 2006, CINMS formed a partnership with Dr. John Hildebrand at Scripps Institute of Oceanography. Dr. Hildebrand and his lab are monitoring shipping traffic, shipping noise, and marine mammal vocalizations in the Santa Barbara Channel (as well as in the Stellwagen Bank National Marine Sanctuary). They are also studying marine mammal behavior in response to ship noise, and CINMS has assisted with vessel and staff support. Dr. Hildebrand's work is a step toward addressing Sanctuary Advisory Council acoustic sources and impacts recommendations 1 (initiate Sanctuary-wide noise monitoring) and 3 (study anthropogenic noise impacts on Sanctuary ecology). The Sanctuary's

[47] Masking is "the reduction in an animal's ability to detect relevant sounds in the presence of other sounds" (National Research Council 2003).

partnerships are also a step towards addressing Sanctuary Advisory Council acoustic policy and partnerships recommendation 2 (develop partnerships).

CINMS will continue to work with partners to address the Sanctuary Advisory Council acoustic recommendations through the activities outlined in Strategy RP.2 to respond to acoustic issues, Strategy CS.3 to conduct acoustic research and monitoring, and Strategy CS.8 on vessel tracking.

Introduced Species

The Sanctuary defines introduced species as: (1) any species (including but not limited to any of its biological matter capable of propagation) that is non-native to the ecosystems of the Sanctuary; or (2) any organism into which altered genetic matter, or genetic matter from another species, has been transferred in order that the host organism acquires the genetic traits of the transferred genes. Introduced species can have several types of impacts on native coastal marine species (for addition details, including references, see Vol. II, FEIS, Section 3.5.5):

- Replacement of a functionally similar native species through competition;
- Reduction in abundance or elimination of an entire population of a native species, which can affect native species richness;
- Inhibition of normal growth or increased mortality of the host and associated species;
- Increased intra- or interspecies competition with native species;
- Creation or alteration of original substrate and habitat;
- Hybridization with native species;
- Other genetic effects;
- Transfer of new parasites and diseases; and
- Direct or indirect toxicity (*e.g.*, toxic diatoms).

According to the International Maritime Organization (IMO 2000), the introduction of introduced species into new environments has been identified as one of the four greatest threats to the world's oceans, along with land-based sources of marine pollution, overexploitation of living marine resources, and physical alteration/destruction of marine habitat. Introduced species have negatively impacted over 45 percent of listed threatened or endangered species in the United States; the establishment of introduced species is second to habitat loss as the major threat to native species diversity (Government Accounting Office 2002; Kimball 2001; Wilcove *et al*. 1998). The California Department of Fish and Game (CDFG) asserts "invasive species are the number two threat to rare, threatened or endangered species nationwide, second only to habitat destruction," (Leet *et al*. 2001). At least 500 non-native species have invaded marine and estuarine habitats within the U.S. (deRivera *et al.* 2005). A 2005 report on non-native species monitoring in west coast national marine sanctuaries and National Estuarine Research Reserves, and adjacent areas, identified 16 non-native sessile invertebrate species in Ventura County marinas that were originally introduced elsewhere on the west coast through vectors including shipping (hull-fouling), fisheries (accidental introduction via oysters), and ballast water (deRivera *et al.* 2005).

Commercial and recreational vessel traffic is a vector for the spread of introduced species. Ballast water, vessel hulls, rudders, propellers, seawater piping systems, intake screens, ballast pumps and sea chests are capable of inadvertently transporting species. Once introduced species have become established in a vessel they may be transported from the affected port to other international and domestic ports or simply by drifting as planktonic larvae in ocean currents. Introduced species are also transported by dredging/drilling equipment, dry docks, buoys, seaplanes, canals, marine debris, and recreational equipment (Carlton 2001). Animals purposely transported for research, restoration, education and

aquarium activities also have potential for illegal release, whether intentional or accidental. For more information on the impacts of introduced species, see the FEIS (Vol. II, Section 3.5.5).

Introduced species issues for CINMS include determining: a) the extent of introduced species invasions, b) sources of species introduction and relative risks, and c) the role of public and industry outreach and education in preventing or detecting species introduction. Working with key partners, such as the CDFG, Department of Boating and Waterways, and other agencies and experts, CINMS would like to play a role in strengthening efforts to control the release of introduced species in the Channel Islands region. There is a regulatory prohibition on introduced species release within CINMS included as part of this management plan review (see FEIS, Vol. II, Section 2.1.13). This prohibition is designed to help reduce the risk from introduced species, including their seeds, eggs, spores, and other biological material capable of propagating as introduced species may threaten the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agriculture, aquaculture, or recreational activities dependent on such waters.

Several biological monitoring programs currently underway in CINMS track introduced species as part of their regular monitoring efforts. In addition, there is currently a five-year project at Moss Landing Marine Lab underway to catalog invasive species in California.

Limited Spatial Data on Sanctuary Resources and Use

Following designation in 1980, the Sanctuary was managed for many years without the benefit of having access to a comprehensive database of information about the species, habitats, physical features, and human use patterns present within CINMS. In recent years, however, CINMS has developed a growing database of information about many of these resources and human activities. Aided by expertise on staff, state of the art geographic information system (GIS) databases, data-sharing partnerships and data collection programs, CINMS now manages extensive databases of information about physical and biological resources of the Sanctuary, as well as human use patterns. Much of this data is still limited in some ways, however, and requires additional analysis before it can be readily used to help address resource management problems. CINMS staff have acknowledged important work must continue with regard to gathering and analyzing spatial data, and recognize this information will form the basis for future considerations of zoning and other management decisions within the Sanctuary.

Marine Bioprospecting

Biodiversity prospecting, or bioprospecting, is the activity of seeking a useful application, process, or product in nature. Removal of marine life or plants from the Sanctuary has the potential to alter the balance and function of local ecosystems. In addition, collection methods could injure or destroy habitat features.

Although marine bioprospecting has not occurred within the Sanctuary, the Minerals Management Service and UCSB engaged in a limited collaborative research project sampling some marine organisms that form the biofouling community on oil and gas platforms adjacent to the Sanctuary. The grant funding this project was entitled, "*Advancing Marine Biotechnology: Use of OCS Oil Platforms as Sustainable Sources of Marine Natural Products*." The purpose of the MMS-UCSB research was to collect samples of organisms, and then to isolate compounds with anti-cancer and anti-inflammatory potential for further research, and lab synthesis. Due to the limited extent of marine bioprospecting in this area, the implications from this activity are not fully understood, but CINMS will continue to monitor this activity as it occurs.

Marine Mammal Strikes

Heavy vessel traffic creates the possibility of collision with large marine mammals. Although all types of vessels can strike marine mammals, size and speed are the most important variables in assessing the potential for a fatal collision. In a study of historical, world wide strikes between motorized ships and large whales, Laist *et al.* (2001) found most documented lethal or severe ship strikes occurred with vessels over 264 feet in length. Eighty-nine percent of lethal or severe ship strikes were caused by ferries traveling over 12 knots, cargo ships over 14 knots or cruise ships over 29 knots (Laist *et al.* 2001).

The majority of in-transit cargo vessels travel through the Santa Barbara Channel at speeds greater than 14 knots. The Santa Rosa and San Miguel escarpment is heavily populated by blue, fin and humpback whales during the late summer and fall months, making it another area where the potential for a collision with a ship is high. In addition, gray whales cross the shipping lanes during their southern migration.

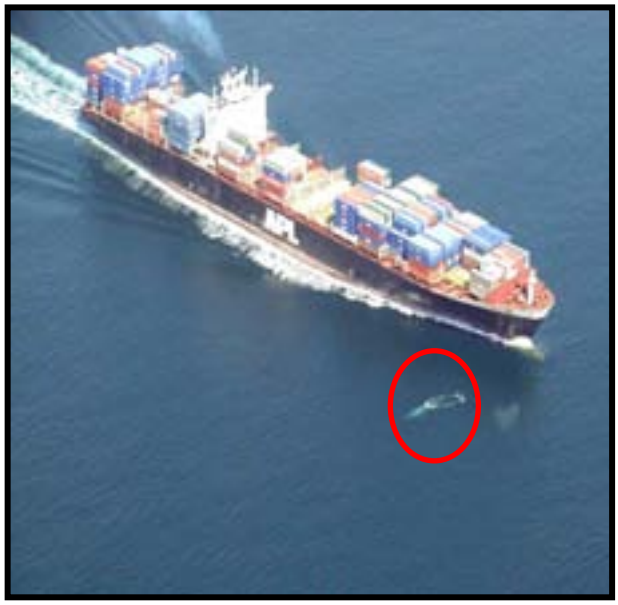

Figure 49. *The Santa Barbara Channel is an important route for both shipping traffic and migrating whales, as demonstrated by this container ship and blue whale (circled) in the southbound shipping lane near Anacapa Island. (U.S. Govt./NOAA)*

NOAA Fisheries data shows ten suspected incidents of vessel collisions with whales were reported between January 1983 and May 1998 within or in close proximity to the Santa Barbara Channel (U.S. Department of Commerce, NOAA, NMFS, Southwest Region, Protected Species Management Division, California Marine Mammal Stranding Network Database).[48] Involved in these collisions were three whale species including: gray (4), fin (3), blue (1) and unidentified (2). The collisions resulted from various vessels types including: three Navy vessels, three freighters, and one whale-watching vessel. The remaining three incidents were stranded whales bearing propeller lacerations assumed to have been a consequence of collisions with unidentified vessels.

However, in the fall of 2007 there were five confirmed blue whale fatalities in the Southern California Bight, several of them bearing evidence of ship strikes. Previously, the greatest number of blue whale fatalities in one year off of California was three (in both 1988 and 2002 respectively), and these fatalities were separated by hundreds of miles (Marin to San Diego County in 2002) and several months. Five fatalities between the months of September and November 2007, across a space focused on the Northern Channel Islands are anomalous (see Figure 50 below), warranting additional research. Experts examined four of the five whales from the fall 2007 fatalities. Of the four whales examined, including an adult female and nearly full term infant combination, at least three were struck by ships and ship strikes are indicated as the proximal cause of death of at least two of them. While ship strikes may have been the proximal cause, strandings may also result from other variables and contributing factors such as domoic acid, mid-frequency acoustic testing, ambient noise sources, infectious disease, an unusually shallow

[48] While in most cases it is almost impossible to determine the actual location of a collision, these incidents are thought to have occurred within or in close proximity to the Santa Barbara Channel.

and/or dispersed aggregation of krill or simply increased local density of whales. In 2004, NOAA Fisheries determined that the Potential Biological Removal (PBR) of this species as 1.4 whales per year in U. S. waters based on their current, endangered population status.[49] The PBR is the maximum number of animals, not including natural mortalities, that can be removed from a stock while allowing the stock to reach or maintain its optimum sustainable population. NOAA Fisheries designated the 2007 incidents as an Unusual Mortality Event (UME). A UME is defined under the Marine Mammal Protection Act as "a stranding[50] that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response."

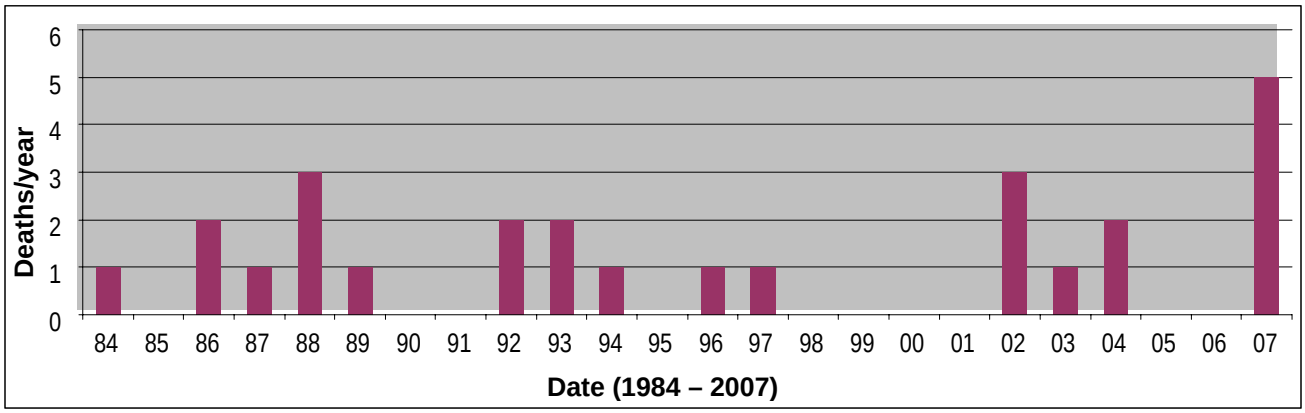

Figure 50. *Number of blue whale fatalities offshore from California (1984 – 2007).*

The Sanctuary Advisory Council expressed a strong interest in understanding the 2007 blue whale ship strikes, and helping to find solutions to the problem. In 2008, CINMS, NOAA Fisheries, and the U.S. Coast Guard, with input from the Sanctuary Advisory Council, developed the *Prevention and Emergency Response Plan for Reducing Ship Strikes on Blue Whales and Other Large Cetaceans in the Channel Islands National Marine Sanctuary and Santa Barbara Channel*. The plan is designed for use by NOAA and the U.S. Coast Guard to guide actions aimed at reducing ship strike risks, and responding to whale strandings. The plan outlines a series of agency actions to: track large cetaceans in the Santa Barbara Channel; implement precautionary actions to reduce the threat of ship strikes; and respond to stranded whales. Detailed throughout the plan are agency resources and contacts for the Santa Barbara Channel region. The agency actions are outlined under three scenarios: the presence of large, ESA-listed cetaceans in the Channel; high risk conditions in which aggregations of such species are observed within or adjacent to the Santa Barbara Channel shipping lanes; and in the event of a stranded whale. As of 2008, the prevention and response plan calls for the U.S. Coast Guard issuance of a Local Notice to Mariners containing a NOAA recommendation that ships 300 GRT or more travel at speeds not in excess of ten knots during high risk conditions. CINMS's role in implementing the plan includes, but is not limited to: serving as an overall liaison between the U.S. Coast Guard, NOAA Fisheries, and other involved organizations; collecting (via vessel and aircraft) and disseminating whale location data; analyzing large ship traffic and speed in the Channel; leading efforts to develop education and outreach to

[49] NMFS Blue Whale Stock Assessment (2004) is available at http://www.nmfs.noaa.gov/pr/pdfs/sars/po2004whbl-en.pdf.

[50] Stranding refers to a marine mammal that is: a) dead, and is on a beach, shore, or is in the water within the Exclusive Economic Zone (EEZ) of the United States; or b) alive, and is on a beach or shore and is unable to return to the water, or is in the water of the EEZ of the United States where the water is so shallow that the specimen is unable to return to its habitat under its own power (source: NOAA Fisheries http://www.nmfs.noaa.gov/pr/glossary.htm#s).

the shipping industry; and developing an ecosystem-based whale research and monitoring plan. The prevention and response plan will be revised as needed in future years.

There has also been direct evidence of vessel strikes with sea turtles. Stranding records show evidence of vessel strikes with leatherback and green sea turtles primarily (USDOC 2003).

Motorized Personal Watercraft

Concerns about impacts from the use of motorized personal watercraft (MPWC) were raised during the public scoping process. In 2000, a National Park Service ban on use of MPWCs at units of the NPS went into effect (36 CFR 3.9(a)) due to potential resource impacts, conflicts with other visitors' uses and enjoyment, and safety concerns (65 FR 15077), and as such applies to waters of the Channel Islands National Park (which extend 1 nmi from island shores). According to sightings from the Sanctuary's aerial monitoring program, the activity has occurred only rarely within CINMS. However, in recent years the Channel Islands National Park has observed a slight increase in use of motorized personal watercraft within the Park, and Park staff issue several dozen warnings per year for violation of the NPS ban (Fitzgerald 2005). Although MPWC use has not been a popular activity within the Sanctuary, more is known today about the threat such craft pose to marine resources. MPWCs operate in a manner unique among recreational vehicles and pose a threat to wildlife. A Sanctuary prohibition mirroring the National Park Service ban of MPWC use will assist in enforcement of this banned activity within 1 nmi from island shores. For more information on this issue, see FEIS section 3.5.8.2 on Motorized Personal Watercraft.

Termination of the Sea Otter Translocation Program

Unless otherwise noted, the following information is derived from USFWS (2005).

In 1982 the USFWS developed a recovery plan for the southern sea otter (herein referred to as otter), which was listed as threatened under the federal Endangered Species Act in 1977. The recovery plan was designed to move otters to multiple areas in their historic habitat, minimizing potential impacts to the population in the event of a natural or manmade disaster in any given area, while minimizing conflicts between translocated animals and shellfish fisheries. In 1987, in an environmental impact statement the USFWS identified San Nicolas Island as their preferred translocation site, and through 1990 released 140 otters there. Many of the released otters left the island for southern or central California, some died, and many were never accounted for. In 2004, 32 otters (excluding dependent pups) were counted at the island.

The recovery plan also included establishment of a management zone from which the USFWS removed otters, using non-lethal means, between 1987 and 1993. Removed otters were relocated to either San Nicolas Island or central California. Between 1993 and 1997 few otters were observed in the management zone. However, due to natural range expansion, large numbers of otters moved into the management zone in 1998. At that time the USFWS determined that the translocation program did not appear to be meeting recovery objectives.

In 2001, the USFWS issued a policy statement in which it indicated that otter containment was inconsistent with the Endangered Species Act requirement to avoid jeopardizing the species, and announced that it would cease removing otters from the management zone pending an environmental review process and final evaluation of the translocation program. In 2005, the USFWS issued a supplemental environmental impact statement (SEIS), supplementing the 1987 statement, in which it proposed terminating the translocation program and not removing otters from the translocation or management zones at the time the decision is made to terminate the program.

If the USFWS ultimately decides to terminate the translocation program, it anticipates that:

> …sea otters may expand their range naturally throughout the entire Southern California Bight. Should sea otters expand their range, we would expect macroinvertebrates, like abalone and sea urchins, to be restricted to habitat that provides refuge from sea otter predation. Macroalgal assemblages would also likely change. The exact nature and magnitude of ecological change is unknown; however, the change would likely result in an ecological community more closely resembling that which occurred naturally prior to the extirpation of sea otters from this area of their historic range during the fur trade. (USFWS 2005: 216)

Otter range expansion has potential implications for recovery of white abalone (federally listed as endangered under the ESA) and black abalone (a candidate for listing under the ESA), along with implications for commercial and recreational shellfish fisheries, and ecotourism. Otter may prey on white and black abalone, but the USFWS anticipates that the overall effects of predation will be minor and not to occur at the species level. The USFWS has concluded that commercial and recreational shellfish fisheries would likely be eliminated in or precluded from areas permanently re-occupied by otters, although widespread fishery changes across the SCB would take place gradually over many decades. Another potential fishery implication that could take place gradually over the next several decades is potential habitat improvements for recreationally important finfish.

Sea otters are not expected to have an effect on the Sanctuary within ten years. While they have not yet re-colonized areas within the Sanctuary, they would likely eventually reestablish their range within Sanctuary boundaries. NOAA anticipates that eventual reestablishment of sea otters at the Channel Islands will result in biological and socioeconomic changes in the Sanctuary. Consequently, in the event that any socioeconomic or biological changes take place in the Sanctuary due to sea otter natural range expansion during the next five to ten years, application of strategies RP.1 and RP.2 of this action plan can help CINMS identify and if and where appropriate address such changes. If no effects of sea otter natural range expansion occur over the next ten years, it is possible that as changes do begin to occur the Sanctuary may be in the midst of another management review cycle and therefore be poised to identify and address any changes (if appropriate) as part of the management plan review.

Wildlife Disturbance Caused By Artificial Lighting

Since 1999, the Sanctuary has tracked the potential impacts of lights on seabirds and other Sanctuary resources and users from the squid fishing industry and other light sources. The Sanctuary has worked with the fishing industry, resource management agencies and wildlife researchers to minimize impacts from light, including light shields, wattage reduction, and zoning sensitive seabird areas where fishing activity is prohibited. The Sanctuary will continue to work with the above named parties and support additional research and monitoring on the effect of light on wildlife and users. The California Fish and Game Commission is responsible for the regulation of squid fishing.

Addressing the Issues – Strategies From This Action Plan

There are three strategies designated for this Resource Protection Action Plan:

- RP.1 – Identifying & Assessing Current and Emerging Issues;
- RP.2 – Responding to Identified Issues; and
- RP.3 – General Marine Zoning

STRATEGY RP.1 – IDENTIFYING & ASSESSING CURRENT AND EMERGING ISSUES

- *Objective:* To identify, understand and prioritize current and emerging issues that may pose a threat to Sanctuary resources or qualities.
- *Implementation:* Resource Protection, Research and Monitoring, Education and Outreach, Maritime Heritage, and Community and Management Planning staff

Background

To provide long-term ecosystem-based protection to the Sanctuary, while allowing public use compatible with the Sanctuary's primary purpose of resource protection, CINMS staff must keep abreast of new activities and changing natural processes within and around the Sanctuary. It is essential that CINMS staff gain a quick and accurate understanding of new issues, and assess the priority for research or response based on sound criteria. Such criteria should be generally based on the degree of threat potentially posed to CINMS resources, consider the urgency of possible impacts, and also be based on the Sanctuary's appropriate capabilities, resources and jurisdictional authority. This strategy provides a framework and process for identifying current or emerging issues, assessing priorities, and tracking those issues over time.

Activities (3)

(1) Develop Comprehensive List of Issues. Drawing on existing knowledge and on information gathered during the course of CINMS Conservation Science activities, and with input from the Sanctuary Advisory Council, continue to revise and evaluate the list of current and emerging resource protection issues, including those above. This list should be evaluated in conjunction with the Advisory Council's annual work plan and should be revised as new potential issues are identified.

Status: Complete in year one, maintain annually thereafter
Partners: Internal task, with input from Sanctuary Advisory Council and others

(2) Periodically Assess and Prioritize Current and Emerging Issues List. Assessment of the issues list should be based on clearly defined criteria for determining issue importance, such as:

- Intensity, duration, and geographic extent of potential threat to CINMS resources or qualities;
- Whether the issue falls within the Sanctuary's mandate;
- Whether the Sanctuary has the jurisdiction and/or authority to address the issue;
- Rate at which the issue or potential threat is growing or emerging; and
- Degree of public or Advisory Council interest in Sanctuary involvement in issue

Issue prioritization should also be based on input from the Advisory Council and its working groups, from scientific experts, and based on staff assessments. An effort is made to learn from the latest available information and research and to invite experts for informational presentations to the Advisory Council. This assessment should be repeated at least annually.

Status: Complete by year one, maintain thereafter
Partners: Internal, with input from Sanctuary Advisory Council and its working groups

(3) Track Emerging Issues. Track issues that have the potential to emerge and become priorities for action. This requires the input of agencies, researchers, and the Research Activities Panel. CINMS staff will seek and review input from researchers on the extent of emerging issues.

Status: Implement improved tracking by year two and maintain thereafter
Partners: Internal

STRATEGY RP.2 – RESPONDING TO IDENTIFIED ISSUES

- *Objective:* To provide necessary protection to Sanctuary resources by responding in a timely and effective manner to current and emerging issues posing potential threats to Sanctuary resources.
- *Implementation:* Resource Protection, Research and Monitoring, Education and Outreach, Maritime Heritage, and Community and Management Planning staff

Background

The Sanctuary is affected by a complex and dynamic state of affairs, including significant population growth in counties adjacent to the Sanctuary, rapid technological changes affecting the nature and extent of commercial and recreational maritime activities, and improvements in monitoring and detection capabilities within the ocean environment. As new resource protection issues and challenges emerge, or knowledge about existing issues alerts us to new concerns, CINMS staff must be ready to respond appropriately in accordance with the Sanctuary's mandate to provide long-term resource protection. This strategy calls for CINMS staff to consult with other agencies and the Sanctuary Advisory Council on new issues and take appropriate action to address current and emerging issues of concern.

Activities (2)

(1) Consult with the Sanctuary Advisory Council. Staff will inform and be informed by the Sanctuary Advisory Council about current and emerging issues, arrange for presentations by experts, and seek the Council's advice on management actions.

Status: Occurring since 1998, to continue at bi-monthly meetings across years 1-5
Partners: Sanctuary Advisory Council

(2) Respond to Issues. Based on research and prioritization of issues (see Strategy RP.1) and, where appropriate, consultation with the Sanctuary Advisory Council, staff will respond to current and emerging issues in a number of ways, including but not limited to:

- Consultation with local, state, or federal agencies with a leading or shared authority for addressing the issue;
- Commenting on local or regional private sector or government projects;
- Formation of a working group, via the Advisory Council, to develop options for addressing the issue;
- Applying existing CINMS programs (*e.g.*, education, outreach, research, or monitoring) to address the issue;
- Proposing new CINMS regulations; and/or
- Formation of an action plan, particularly for large, complex, long-term issues with multiple interested parties, to be developed by staff or a multi-stakeholder working group. (The framework for determining when to develop new action plans, described in the Action Plans – Background section of this document, would be utilized.) New action plans for resource protection issues may include increased research activities to study a given resource protection issue. Research activities can be focused on issues through partnerships with scientific experts (see Strategy CS.3).

Status: Occurring since designation; process improvements implemented in year 1 and maintained thereafter
Partners: Internal, various partner agencies, Sanctuary Advisory Council

STRATEGY RP.3 – GENERAL MARINE ZONING

- *Objective:* To consider the use of marine zoning as a tool to protect and enhance biodiversity and manage various uses of the Sanctuary.
- *Implementation:* Resource Protection staff

Background

Zoning represents an important management tool used in the Sanctuary since 1980 to separate competing human uses or address human uses incompatible with resource protection. CINMS zoned areas include: a one nmi buffer area around the islands prohibiting most large vessels; a fly-over zone within one nmi and 1000 foot altitude around the island shores to prevent aircraft from disturbing marine mammals and seabirds; and approximately 240 square nautical miles of marine reserves and marine conservation areas in which consumptive uses are prohibited or restricted (Figure 51). Other government agencies have established and manage marine zones wholly or partially within the Sanctuary, too, such as the voluntary vessel traffic separation scheme running along the Santa Barbara Channel administered by the USCG. The Channel Islands National Park (CINP) has zoned certain sea caves off limits to protect seabirds during nesting seasons, certain beaches are closed to protect marine mammal haul outs, and motorized personal watercraft are banned throughout the park due to noise impacts on wildlife along with air and water quality impacts. Where such zoning occurs or is proposed within the Sanctuary, CINMS has worked closely with appropriate agencies to collaborate or partner in improving resource protection and public access.

This strategy calls for CINMS to first improve its baseline of spatial data on physical and biological resources of the Sanctuary, as well as human use patterns. Working from this baseline, CINMS will be in a better position to work with partners on assessing management problems from a spatial standpoint, and will be able to consider adaptively managing existing zones and the utility of additional marine zoning within the Sanctuary.

Activities (2)

(1) Analyze Spatial Data. CINMS, in consultation with the Advisory Council and agency partners, will analyze spatial data collected on the distribution of marine resources and human activities. This analysis will provide a clearer understanding of the geographic extent of sensitive resources and human activities, and will provide the baseline information necessary for consideration of zoning as a tool to help address specific management issues.

Status: Complete by year four
Partners: Sanctuary Advisory Council, federal and state agency resource management partners

(2) Evaluate Utility of Zoning Strategies for the Sanctuary. The Sanctuary (working with the Advisory Council) will evaluate resource management needs and consider the utility of other types of marine zones. If appropriate, a zoning plan will be proposed, to include goals, objectives, implementation strategies, monitoring programs, enforcement plans and performance indicators.

Status: Complete evaluation by year five
Partners: Potential partners include: the Sanctuary Advisory Council, Channel Islands National Park U.S. Fish and Wildlife Service, U.S. Coast Guard, California Department of Fish and Game, Pacific Fishery Management Council and other appropriate local, state and federal agencies

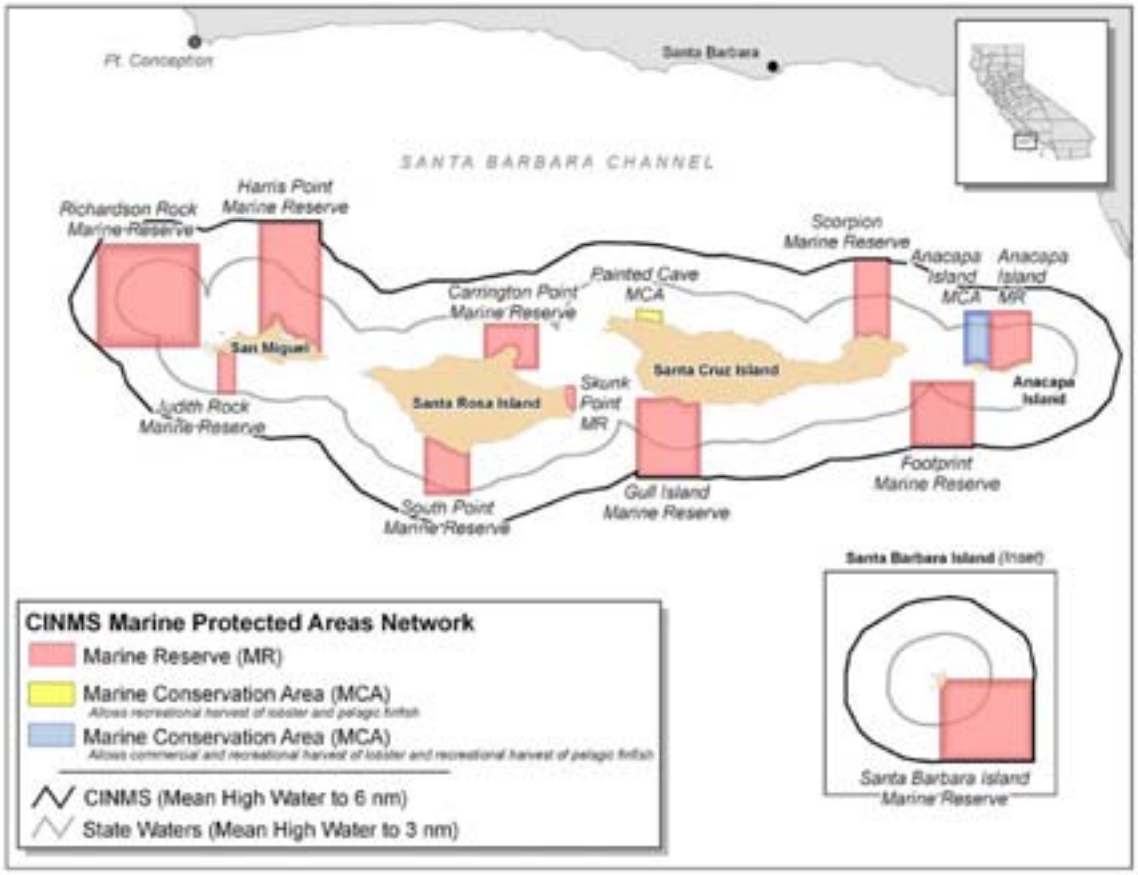

Figure 51. *Marine reserves and conservation areas within CINMS (2008).*

Table 12. Estimated Costs for the Resource Protection Action Plan

Strategy	Estimated Annual Cost (in thousands)*					Total Estimated 5 Year Cost
	YR 1	YR 2	YR 3	YR 4	YR 5	
RP.1: Identifying & Assessing Current and Emerging Issues	-	-	-	-	-	-
RP.2: Responding to Identified Issues**	unknown	unknown	unknown	unknown	unknown	unknown
RP.3: General Marine Zoning	-	-	$10	$10	-	$20
Estimated Total Annual Cost	**-**	**-**	**$10**	**$10**	**-**	**$20**

* Other than base budget funding requirements (salaries, overhead, etc.), which are not included in this table, future programmatic costs of RP.1 and RP.2 are largely unknown given the unpredictable nature of resource protection issues.
** The costs associated with properly responding to resource protection issues may vary significantly on an issue-by-issue basis.

Addressing the Issues – Strategies From Other Action Plans

In addition to the strategies identified in this Resource Protection Action Plan, there are strategies from other action plans either directly or indirectly addressing resource protection issues:

- AU.2 – Community Involvement/Volunteer & Intern Program Development;
- AU.3 – Team OCEAN;
- AU.4 – Developing Outreach Technology;
- AU.6 – Developing Education & Outreach Tools & Products;
- CS.1 – Sanctuary Aerial Monitoring and Spatial Analysis Program;
- CS.3 – Supporting Monitoring and Site Characterization Programs;
- CS.4 – Collaborative Marine Research Project;
- CS.5 – Research Interpretation;
- WQ.2 – Water Quality Protection Planning;
- EE.1 – Emergency Response Planning & Implementation;
- OP.1 – Sanctuary Advisory Council Operations;
- OP.2 – Permitting and Activity Tracking;
- OP.3 – Relationships With Other Authorities; and
- OP.8 – Greening Facilities & Operations

Addressing the Issues – Regulations

Many of the Sanctuary's regulations are or may, in part, be related to some of the current and emerging issues mentioned in this action plan. These include regulations that in summary prohibit:

- Exploring for, developing, or producing hydrocarbons, with an exception for grandfathered leases (executed prior to March 30, 1981), and an exception for laying pipeline;
- Discharging or depositing material or other matter, with exceptions related to fishing, vessels, military vessels, and lawful hydrocarbon activities;
- Disturbing protected species, with several exceptions;
- Operating certain types and classes of vessels within one nmi of island shores;
- Altering Sanctuary submerged lands, including by constructing structures, with exceptions for laying hydrocarbon pipeline, other lawful hydrocarbon activities, anchoring vessels, and fishing activities;
- Within a marine reserve, marine park, or marine conservation area, harvesting, removing, taking, injuring, destroying, possessing, collecting, moving, or causing the loss of any Sanctuary resource, including but not limited to living or dead organisms or historical resources, or attempting any of these activities; and
- Within a marine reserve, or marine conservation area, possessing fishing gear, unless, among other exceptions, such gear is stowed and not available for immediate use.

The full suite of Sanctuary regulations is available at 15 CFR 922.70-922.74.