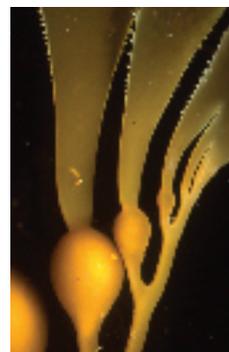




Channel Islands National Marine Sanctuary



Final Management Plan/ Final Environmental Impact Statement

**Volume I of II:
Final Management Plan**



January 2009

**U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
National Marine Sanctuary Program**

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Channel Islands National Marine Sanctuary
113 Harbor Way
Santa Barbara, CA 93109

January 2, 2009

Dear Interested Party:

The National Oceanic and Atmospheric Administration (NOAA), Office of National Marine Sanctuaries announces completion of the revised final management plan for the Channel Islands National Marine Sanctuary. The sanctuary is located off Santa Barbara and Ventura counties in southern California and was designated in 1980. The sanctuary extends seaward approximately six nautical miles (nmi) from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock. The sanctuary protects rich, diverse, and productive marine ecosystems and submerged cultural resources within an approximately 1,470 square statute mile area (1,110 square nmi). The area is particularly noted for its kelp forests, rocky shores, submerged Chumash cultural artifacts, over 140 shipwrecks and aircraft wrecks, and diverse species of marine mammals, seabirds, invertebrates and fish.

The final management plan identifies priority management issues and actions proposed to address them. For example, the plan includes actions to expand research, education, outreach, and enforcement programs, create and enhance partnerships, improve wildlife protections, develop a water quality program, and reduce pollution impacts from vessels. The new plan represents a major revision of the sanctuary's original 1983 management plan.

The final management plan is accompanied by a final environmental impact statement (FEIS; released November 25, 2008), which analyzes a range of alternatives for modified and new Sanctuary regulations, provides environmental and socioeconomic impact analyses of those regulatory alternatives, and provides responses to public comments previously submitted on the draft management plan and draft environmental impact statement. These two documents are bundled together in two volumes: the final management plan is Volume I, and the FEIS is Volume II. Of the alternatives analyzed in the FEIS, NOAA has decided to implement the proposed action alternative. A final rule, published in the Federal Register, presents the new Sanctuary regulations. Changes to sanctuary regulations focus on key issues including ecosystem protection, wildlife disturbance, vessel traffic, water quality, and introduced species.

For more information on the management plan review, new Sanctuary regulations, and to download copies of the final management plan, FEIS, and Final Rule, please visit the "Management Plan" section of our web site: <http://channelislands.noaa.gov/>.

Sincerely,

Christopher T. Mobley, Superintendent
Channel Islands National Marine Sanctuary



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ABOUT THIS DOCUMENT

This document is the management plan for the Channel Islands National Marine Sanctuary (CINMS). This plan will serve as the primary management document of the Sanctuary for approximately the next five years.

Comments or questions on this management plan should be directed to:

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From 1999 through 2008, the Sanctuary Advisory Council was instrumental in the development of the management plan and Environmental Impact Statement. NOAA acknowledges and thanks Advisory Council representatives for their individual and collective contributions to this process.

Staff of the Channel Islands National Marine Sanctuary (CINMS) and the National Marine Sanctuary Program (NMSP) are acknowledged for their contribution in the development of the management plan.

The following individuals are acknowledged for providing assistance in preparation of the Environmental Impact Statement: Michelle Bates, Thomas Collinson, Leray De Wit, Jacqueline Eldridge, Brandon Elliott, Angela Emery, Dr. John M. Engle, Alice Green, Dr. Michael Henry, Peter Howorth, Geri Ige, Amy Jacobsen, Kathleen Kefauver, Mick Kronman, Dr. Bob Leeworthy, Luanne Lum, Christina McGinnis, Dr. Michael McGinnis, Diane Randall, Dr. Mark Rigby, Shirley Warren, and Michelle Wilson.

EXECUTIVE SUMMARY

Overview

Designated in 1980, the Channel Islands National Marine Sanctuary (CINMS or Sanctuary) consists of an area of approximately 1110 square nautical miles (nmi)¹ of coastal and ocean waters, and the submerged lands thereunder, off the southern coast of California. The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six nmi from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (the Islands).

Located offshore from Santa Barbara and Ventura Counties in southern California, the Sanctuary's primary objective is to conserve, protect, and enhance the biodiversity, ecological integrity, and cultural legacy of marine resources surrounding the Channel Islands for current and future generations. The significance of this objective is underscored by the Sanctuary's rich and diverse range of marine life and habitats, unique and productive oceanographic processes and ecosystems, and culturally significant resources.

This management plan is Volume I of a two-volume set. It contains information about the Sanctuary's environment and resources, staffing and administration, regulations and boundary, operational and programmatic costs, priority management issues and the actions proposed to address them, and performance measures. This management plan represents a major revision of the original 1983 management plan under which the Sanctuary previously operated.

The Final Environmental Impact Statement (FEIS) is Volume II of the set. It has been developed in compliance with the National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4370 *et seq.*) and Council on Environmental Quality (CEQ) regulations (40 CFR parts 1500-1508), contains detailed information on the greater Sanctuary region, presents a range of alternatives for modified and new Sanctuary regulations, and provides environmental and socioeconomic impact analyses of those alternatives.

The Management Plan

History of the Management Plan Review Process

Although the first national marine sanctuary was designated in 1975, the initiation of the CINMS management plan review in 1998 marked the first formal management plan review of any sanctuary in the National Marine Sanctuary System. CINMS began this process with an internal review of the

¹ From 1980 to 2007, the area of CINMS was described as approximately 1252.5 square nautical miles. However, in 2007 NOAA re-calculated the original CINMS area as approximately 1113 square nautical miles (72 FR 29208). Also in 2007, NOAA designated the federal portion of the Channel Islands MPA network, consisting of eight marine reserves and one marine conservation area within the CINMS (72 FR 29208). The marine reserves are distributed throughout the CINMS and extend slightly beyond the current boundaries of the CINMS in four locations, increasing the overall size of the Sanctuary by approximately 15 square nautical miles. This change allows the boundary of four of the marine reserves to be defined by straight lines projecting outside the original CINMS boundary, allowing for better enforcement of the marine reserves. Adjusting for technical corrections and using updated technologies, NOAA has re-calculated the CINMS area as approximately 1470 square statute miles (1110 square nmi). This change does not constitute a change in the geographic area of the Sanctuary, but rather an improvement in the estimate of its size.

effectiveness of site programs and policies relative to the 1983 management plan's goals and objectives and the purposes and policies of the National Marine Sanctuaries Act (NMSA). Also in 1998, CINMS formed a Sanctuary Advisory Council (Advisory Council) as a forum through which Sanctuary constituents could provide advice to the Sanctuary Superintendent, including advice on the management plan review.

In the summer of 1999, Sanctuary staff held several public scoping meetings across San Luis Obispo, Santa Barbara, Ventura and Los Angeles counties (one meeting was also held in Washington, D.C.). During these meetings, numerous individuals raised a wide range of local, regional and national resource management issues. After reviewing and synthesizing these comments, CINMS and NMSP staff, working closely with the Advisory Council, identified a set of priority resource management issues to be addressed in the new management plan.

Developing the Management Plan

In 2000, CINMS and NMSP headquarters staff began to draft the revised management plan. At the same time, Tetra Tech, Inc. was contracted to begin drafting the draft environmental impact statement (DEIS). Over the next few years, several revisions were made to the draft management plan with periodic input from the Advisory Council. In 2006, NOAA released the draft management plan and DEIS for public review and comment, followed by a Supplemental DEIS (SDEIS) in 2008. NOAA received over 700 comments from agencies, organizations, and individuals during the comment periods. NOAA has addressed all substantive public and agency comments, and where appropriate has revised the management plan and EIS according to responses to comments. Public and agency comments received during the 2006 and 2008 public comment periods, and NOAA's responses to these comments, are provided in Vol. II, Appendix B.

In addition to revising the management plan and EIS per responses to comments, Sanctuary staff have made minor revisions to update outdated information, and to correct minor typographical, technical, and formatting errors. Vol. I, Appendix C and Vol. II, Appendix B contain information about changes made to the management plan and EIS, respectively, between Draft and Final versions.

The foundation of this management plan is the action plans, which detail the management actions (non-regulatory "strategies" and regulations) the Sanctuary will take to address the priority issues and meet the purposes and policies of the NMSA.²

Purpose of This Document

Based on purposes and policies set forward by the NMSA, all thirteen national marine sanctuaries engage in management plan review in order to:

- Evaluate substantive progress toward implementing the management plan and goals, especially the effectiveness of site-specific management techniques and strategies;
- Determine necessary revisions to the management plan; and,
- Prioritize management objectives.

In addition, CINMS recognizes significant advances in science and technology, innovations in marine resource management techniques, and challenging new resource management issues have emerged and, as such, have rendered the original 1983 management plan obsolete. Thus, the management plan revision process is also a vehicle for the Sanctuary to integrate new tools and practices into site management.

² The NMSA can be found online at:

<http://www.sanctuaries.nos.noaa.gov/natprogram/nplegislation/nplegislation.html>.

With this in mind, the purpose of this management plan is twofold: 1) to inform Sanctuary constituents, including the general public, about the Sanctuary and the management actions CINMS has planned for the next five years, and 2) to guide site management toward achievement of the Sanctuary's goals with the best means available.

Organization of this Document

The management plan is organized into four principal sections.

- **Section I** is an introduction presenting background information on the national marine sanctuaries and the management plan review process.
- **Section II** provides context by describing the Sanctuary setting. This section is divided into four sub-sections: II-A) The Physical Setting; II-B) The Biological Setting; II-C) The Human Setting; and II-D) The Operational Setting.
- **Section III** contains the action plans, which detail the management actions the Sanctuary will take to address priority issues and meet the purposes and policies of the NMSA.
- **Section IV** contains a number of appendices, which provide supporting information on various aspects of this management plan.

A summarized list of the management strategies (binned by action plan) found in this management plan is presented on the following page. A more detailed version of this list, which presents information on the status, funding source, level of partnership coordination, and levels of implementation for each strategy can be found in Appendix A1: Action Plan Summary Table.



Figure 1. California brown pelican (Shane Anderson)

Management Strategies By Action Plan

Public Awareness and Understanding Action Plan

- | | |
|---|---|
| AU.1 – Education Program Development | AU.6 – Developing Education & Outreach Tools & Products |
| AU.2 – Community Involvement/Volunteer & Intern Program Development | AU.7 – Visitor Center Support & Development |
| AU.3 – Team OCEAN | AU.8 – MPA Network Education |
| AU.4 – Developing Outreach Technology | AU.9 – Multicultural Education |
| AU.5 – Greater Southern California Outreach | |

Conservation Science Action Plan

- | | |
|---|--|
| CS.1 – Sanctuary Aerial Monitoring and Spatial Analysis Program | CS.5 – Research Interpretation |
| CS.2 – Comprehensive Data Management | CS.6 – Biological Monitoring of MPA Network |
| CS.3 – Support Monitoring and Site Characterization Programs | CS.7 – Socioeconomic Monitoring of MPA Network |
| CS.4 – Collaborative Marine Research Project | CS.8 – Automated Identification System (AIS) Vessel Tracking |

Boundary Evaluation Action Plan

- BE.1 – Final Determination on Boundary Issue

Water Quality Action Plan

- WQ.1 – Offshore Water Quality Monitoring
WQ.2 – Water Quality Protection Planning

Emergency Response & Enforcement Action Plan

- EE.1 – Emergency Response Planning & Implementation
EE.2 – Expanding Enforcement Efforts

Maritime Heritage Action Plan

- | | |
|--|---|
| MH.1 – The Shipwreck Reconnaissance Program | MH.4 – Implementing a Coordinated MHR Protection Outreach Effort |
| MH.2 – MHR Volunteer Program | MH.5 – Upgrading the Maritime Heritage Website |
| MH.3 – Partnering With the Santa Barbara Maritime Museum | MH.6 – Supporting Public Education of Chumash Native American Maritime Heritage |

Resource Protection Action Plan

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

Operations Action Plan

- | | |
|--|---|
| OP.1 – Sanctuary Advisory Council Operations | OP.5 – Administrative Initiatives |
| OP.2 – Permitting and Activity Tracking | OP.6 – Human Resources |
| OP.3 – Relationships With Other Authorities | OP.7 – Office Space Expansion |
| OP.4 – Vehicle, Boat & Aircraft Operations | OP.8 – Greening Facilities & Operations |

Performance Evaluation Action Plan

- EV.1 – Measuring Sanctuary Performance Over Time

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SECTION I: INTRODUCTION



Figure 2. Breaching humpback whales may be seen at the Channel Islands during their seasonal migrations through the Santa Barbara Channel. (David O. James)

This section provides background on the National Marine Sanctuary Program, the Channel Islands National Marine Sanctuary, and the management plan review process. It describes the organic act establishing the National Marine Sanctuary Program and the administrative hierarchy within which the program resides. Next, it details the history, goals, and accomplishments of the Channel Islands National Marine Sanctuary. Finally, this section introduces the fundamental steps of the management plan review process and explains how this process has been carried out at the Channel Islands concluding with development of this revised management plan.

Overview of the National Marine Sanctuary Program

The National Marine Sanctuary Program (NMSP)³ serves as the trustee for a system of 14 marine protected areas,⁴ encompassing more than 150,000 square miles of marine and Great Lakes waters from Washington State to the Florida Keys, and from Lake Huron to American Samoa. The system includes: 13 national marine sanctuaries and the Papahānaumokuākea Marine National Monument in the northwestern Hawaiian Islands (see Figure 3). The NMSP is part of the National Oceanic and

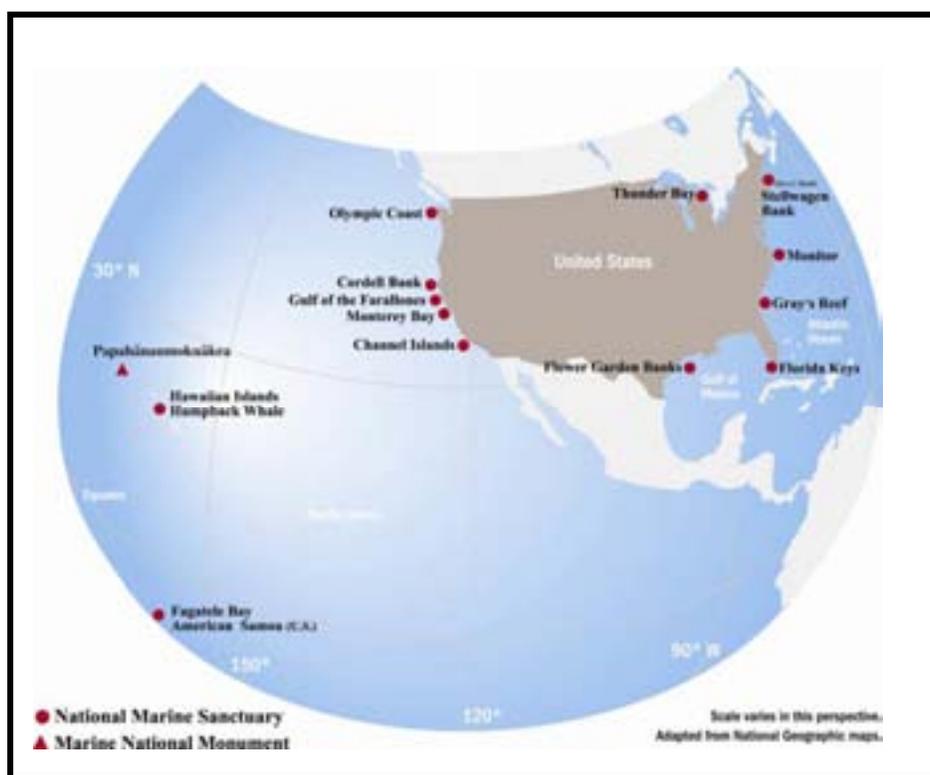


Figure 3. *The National Marine Sanctuary System*

³ The National Marine Sanctuary Program was recently elevated to an “Office” level within NOAA’s National Ocean Service (NOS). Therefore, the official name of the operating unit within NOAA that implements the National Marine Sanctuaries Act is now the National Ocean Service Office of National Marine Sanctuaries. However, to minimize confusion that might be created by using different operating unit names between the draft and final environmental impact statements, we have chosen to use National Marine Sanctuary Program and its associated acronym NMSP in this document.

⁴ Ex. Ord. No. 13158, May 26, 2000, 65 F.R. 34909 sec. 2. (a) defines a “marine protected area” as, “...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.”

Atmospheric Administration (NOAA), which manages sanctuaries by working cooperatively with the public to protect sanctuaries while facilitating compatible recreation and commercial activities. Within NOAA, the NMSP is administered by the NOAA Ocean Service, Office of National Marine Sanctuaries. The mission of the NMSP is to identify, protect, conserve, and enhance the natural and historical/cultural resources, values, and qualities of the National Marine Sanctuary System for this and future generations throughout the nation. Toward this mission, the NMSP works to achieve seven program-wide goals:

1. Identify, designate, and manage sanctuaries to maintain the natural biological communities in sanctuaries and to protect and, where appropriate, restore and enhance natural habitats, populations, and ecological processes, through innovative, coordinated, and community-based measures and techniques.
2. Build and strengthen the nation-wide system of marine sanctuaries, maintain and enhance the role of the NMSP's system in larger marine protected area networks, and help provide both national and international leadership for marine protected area management and marine resource stewardship.
3. Enhance nation-wide public awareness, understanding, and appreciation of marine and Great Lakes ecosystems and maritime heritage resources through outreach, education, and interpretation efforts.
4. Investigate and enhance the understanding of ecosystem processes through continued scientific research, monitoring, and characterization to support ecosystem-based management in sanctuaries and throughout U.S. waters.
5. Facilitate human use in sanctuaries to the extent such uses are compatible with the primary mandate of resource protection, through innovative public participation and interagency cooperative arrangements.
6. Work with the international community to strengthen global protection of marine resources, investigate and employ appropriate new management approaches, and disseminate NMSP experience and techniques.
7. Build, maintain, and enhance operational capability and infrastructure that efficiently and effectively support the attainment of the NMSP's mission and goals.

The national marine sanctuaries embrace part of our collective riches as a nation. Within their protected waters, giant humpback whales breed and calve their young, coral colonies flourish, and shipwrecks tell stories of our maritime history. Sanctuary habitats include beautiful rocky reefs, lush kelp forests, whale migration corridors, spectacular deep-sea canyons, and underwater archaeological sites. Our nation's sanctuaries can provide a safe habitat for species close to extinction or protect historically significant shipwrecks. Ranging in size from one-quarter square mile in American Samoa's Fagatele Bay to the more than 5,300 square miles of Monterey Bay, California, to the more than 139,000 square miles of Papahānaumokuākea Marine National Monument in Hawaii, each protected area administered by the NMSP is a unique place needing special protection. Together, these areas protect over 150,000 square miles of coastal, open ocean and Great Lake waters and habitats. Natural classrooms, cherished recreational spots, and valuable commercial industries – marine sanctuaries represent many things to many people.

The National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) conducts research and gathers data about the global oceans, atmosphere, space, and sun, and applies this knowledge to science and service that touch the lives of all Americans (www.noaa.gov). In doing so, NOAA warns of dangerous weather, charts our seas and skies, guides our use and protection of ocean and coastal resources, and conducts research to improve our understanding and stewardship of the environment that sustains us all.

A Commerce Department agency, NOAA provides these services through five major organizations: the National Weather Service, the National Ocean Service, the National Marine Fisheries Service, the National Environmental Satellite, Data and Information Service, and NOAA Research; and numerous special program units. In addition, NOAA research and operational activities are supported by the nation's seventh uniformed service, the NOAA Corps, a commissioned officer corps of men and women who operate NOAA ships and aircraft, and serve in scientific and administrative posts.

The NMSP provides oversight and coordination among the thirteen sanctuaries by setting priorities for addressing resource management issues and directing program and policy development. The NMSP also has responsibility for ensuring the management plan prepared for each sanctuary is consistent with the NMSA and provides a general budget to estimate expenditures for program development, operating costs and staffing.

On an annual basis, the NMSP reviews and adjusts funding priorities and requirements to reflect resource management needs at each of the thirteen sanctuaries. The NMSP also monitors the effectiveness of the management plan, makes recommendations to promulgate regulatory changes where necessary and monitors intra- and inter-agency agreements.

The National Marine Sanctuaries Act

The National Marine Sanctuaries Act (16 U.S.C. 1431 *et seq.*) is the organic legislation governing the NMSP.⁵ The NMSA authorizes the Secretary of Commerce to designate as national marine sanctuaries areas of the marine environment or Great Lakes with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational, or aesthetic qualities. In addition, the NMSA established the

NMSP as the federal program charged with managing national marine sanctuaries. The primary objective of the NMSA is to protect marine resources. The NMSA also directs the NMSP to facilitate all public and private uses of those resources compatible with the primary objective of resource protection.

The purposes and policies of the NMSA are as follows (this is the complete list of purposes and policies taken verbatim from 16 U.S.C. 1431 (b)):

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;

⁵ See <http://www.sanctuaries.nos.noaa.gov/natprogram/nplegislation/nplegislation.html>.

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.

NOAA Ocean Service

As the nation's principal advocate for coastal and ocean stewardship, the NOAA Ocean Service, or NOS (www.nos.noaa.gov), develops the national foundation for coastal and ocean science, management, response, restoration, and navigation. NOS maintains a leadership role in coastal stewardship by bridging the gap between science, management, and public policy in the areas of healthy coasts, navigation, coastal and ocean science, and coastal hazards. Ten program offices are located within NOS:

- *The Office of National Marine Sanctuaries*
- *Center for Operational Oceanographic Products and Services (CO-OPS)*
- *National Centers for Coastal Ocean Science (NCCOS)*
- *Coastal Services Center (CSC)*
- *Office of Coast Survey (OCS)*
- *Office of Ocean and Coastal Resource Management, (OCRM)*
- *Office of Response and Restoration (OR&R)*
- *National Geodetic Survey (NGS)*
- *International Program Office (IPO)*
- *Management and Budget Office (MBO)*

The NMSA and Ecosystem-Based Management

NOAA has a unique mandate from Congress to be a lead federal agency in protecting, managing, and restoring marine resources. To meet this mandate, our scientists, specialists, and external partners contribute world-class expertise in oceanography, marine ecology, marine archeology, fisheries management, conservation biology, natural resource management, and risk assessment. To achieve balance among ecological, environmental, and social influences, we have adopted an ecosystem approach to management. We recognize the transition to an ecosystem approach must be incremental and collaborative. In pursuing this approach, we strive to integrate the concerns, priorities, and expertise of all citizens and sectors in the management of coastal and marine resources.

According to NOAA (2005), “An ecosystem approach to management is management that is adaptive, specified geographically, takes into account ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse social objectives.”

Marine ecosystem-based management relies on the best available scientific information from both the natural and social sciences. It requires an understanding of oceanographic processes, habitat distribution and health, ecological services, and specific information on the abundance and distribution of marine life. In addition, ecosystem-based management requires adapting and learning from new culturally based and socioeconomic information (Agardy 1999). Given ecosystems span diverse geographic, administrative, political and economic boundaries, the need for strong partnerships among resource agencies, non-governmental interests, members of the public and scientific community, user groups and conservationists is essential.

These ideas are supported by the NMSA, which states the NMSP is to “maintain the natural biological communities, and to protect, and, where appropriate, restore and enhance natural habitats populations, and ecological processes” (16 U.S.C. 1431(b)(3)) and “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 the marine environment” (16 U.S.C. 1431(a)(3)).

As such, the 13 national marine sanctuaries subscribe to a broad and comprehensive management approach in keeping with the NMSA’s primary objective of resource protection. This approach is unique in that it differs from the various national and local agencies and laws directed at managing single or limited numbers of species or specific human activities within the ocean. As such, for CINMS, ecosystem-based management serves as a framework for addressing long term protection of a wide range of living and non-living marine resources, while allowing multiple uses of the Sanctuary compatible with resource protection.

Overview of the Channel Islands National Marine Sanctuary

Background

Designated in 1980, the Channel Islands National Marine Sanctuary consists of an area of approximately 1110 square nautical miles (nmi) of coastal and ocean waters, and the submerged lands thereunder, off the southern coast of California. The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six nmi from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (the Islands) (see Figure 4). In 2007, NOAA completed the Channel Islands marine protected area (MPA) network, consisting of a total of ten marine reserves (no-take zones) and two marine conservation areas (limited take zones) within the CINMS, which was initiated by a unique, community-based process. NOAA and the California Department of Fish and Game cooperatively enforce the Channel Islands MPA network through a combination of federal and state regulations.⁶ The MPAs are distributed throughout the CINMS. Four of the marine reserves extend slightly beyond the original boundaries of the CINMS, increasing the overall size of the Sanctuary by

⁶ The state regulations took effect on April 9, 2003.

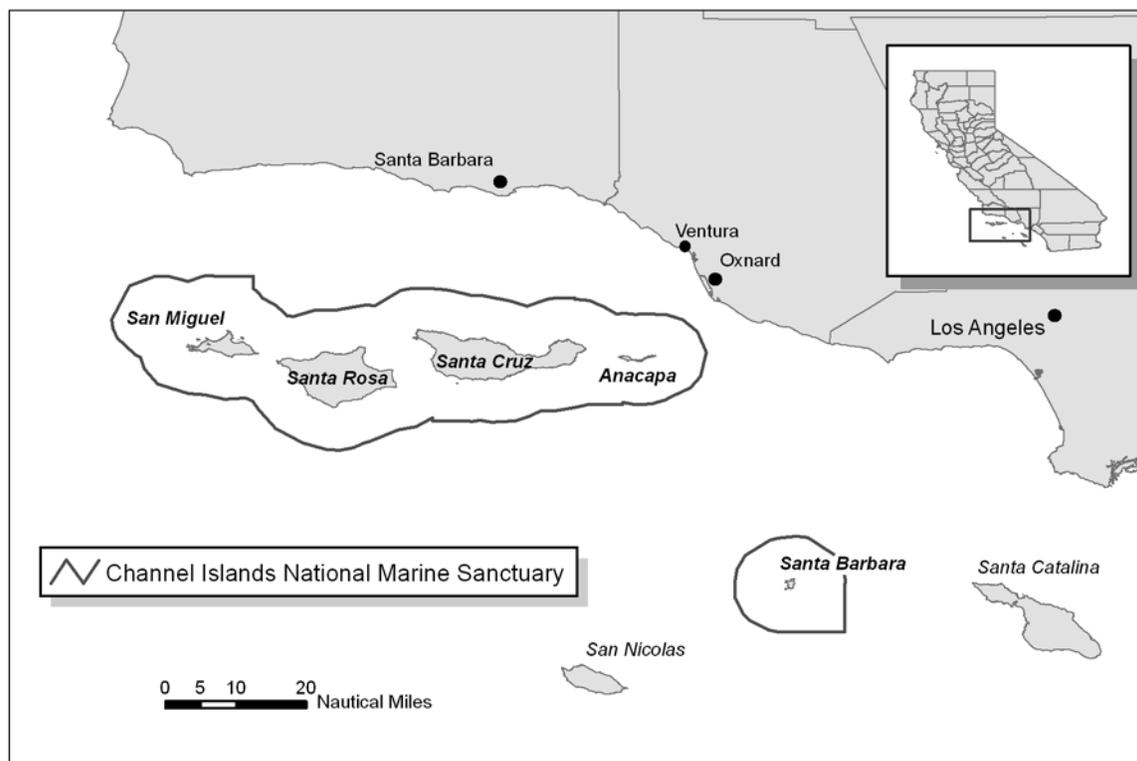


Figure 4. *The Channel Islands National Marine Sanctuary*

approximately 15 square nautical miles to approximately 1110 square nautical miles.⁷ This approximately 15 square nautical mile increase allows the boundaries of these four marine reserves to be defined by straight lines projecting outside the original CINMS boundary, allowing for better enforcement. For a map depicting the MPA network please see Figure 35 on p. 90.

San Miguel, Santa Rosa, Santa Cruz and Anacapa islands are parallel to the east-west trend of the California coast and vary in distance from 12 to 29 nautical miles offshore. Santa Barbara Island lies about 40 nautical miles south of Point Mugu, California.

The Sanctuary supports a rich and diverse range of marine life and habitats, unique and productive oceanographic processes and ecosystems, and culturally significant resources such as submerged Chumash cultural artifacts and hundreds of shipwrecks. The physical, biological, and cultural characteristics of the Sanctuary together provide outstanding opportunities for scientific research, education, recreation, and commerce. Examples of these include commercial and recreational fisheries, marine wildlife viewing, sailing, boating, kayaking and other recreational activities, and maritime shipping. A description of the Sanctuary setting is discussed in Section II of this document.

⁷ From 1980 to 2007, the area of CINMS was described as approximately 1252.5 square nautical miles. However, in 2007 NOAA re-calculated the original CINMS area as approximately 1113 square nautical miles (72 FR 29208) and increased the overall size of the Sanctuary by approximately 15 square nautical miles due to the boundary of four of the marine reserves projecting outside the original CINMS boundary. Adjusting for technical corrections and using updated technologies, NOAA has re-calculated the CINMS area as approximately 1470 square statute miles (1110 square nmi). This change does not constitute a change in the geographic area of the Sanctuary, but rather an improvement in the estimate of its size.

Sanctuary Goals

The management plan review process necessarily includes a review of Sanctuary goals. The original 1983 CINMS management plan contained a series of goals and related objectives. At the onset of the current management plan review, NMSP and CINMS staff reviewed the Sanctuary's original goals, and discussed these goals and Sanctuary performance since they were established, with the Sanctuary Advisory Council.

The Sanctuary's original 1983 goals were stated as follows:

- Resource Protection - The goal assigned highest priority for management is to enhance protection of the marine environment and resources of the Channel Islands National Marine Sanctuary.
- Research - Research activities within the program are directed to resolving management concerns and increasing the understanding of the Sanctuary environment and significant resources.
- Interpretation - Interpretative programs aim to enhance public awareness and understanding of the significance of the Sanctuary and the need to protect its resources.
- Visitor Use - The Sanctuary goal for visitor management is to encourage commercial and recreational use of the Sanctuary that is compatible with protection of its significant resources.

In general, the Sanctuary has made progress towards accomplishing the broad goal areas of the original plan: resource protection, research, interpretation, and visitor use. Through enforcement of regulations and collaboration with other agencies and constituents CINMS has enhanced protection of Sanctuary resources. The Sanctuary has made strides towards directing research efforts to resolving management concerns and increasing understanding of the Sanctuary environment and resources, including through use of the Sanctuary's research vessels. The Sanctuary has developed interpretative programs that enhance public awareness and understanding of the significance of the Sanctuary and the need to protect its resources. The Sanctuary has encouraged commercial and recreational use of the Sanctuary that is compatible with protection of its significant resources, such as placing trained naturalists on board commercial whale watching vessels.

Since Sanctuary designation in 1980, Congress has reauthorized and revised the language of the NMSA, the guiding legislation for the NMSP, several times. The NMSP has determined that the most direct manner of stating the Sanctuary's current goals is to reflect the current guidance from the NMSA.

While the above original Sanctuary goals are still in line with the direction provided by the NMSA, they are missing several important concepts and nuances covered by the current NMSA. The revised set of CINMS goals, derived from the findings, and purposes and policies of the NMSA,⁸ directly reflect the overarching mission of the NMSP and are as follows:

1. Protect the natural habitats, ecological services and biological communities of all living resources inhabiting the Channel Islands National Marine Sanctuary, and the Sanctuary's cultural and archaeological resources, for future generations;
2. Enhance public awareness, understanding, and appreciation of the marine environment and the natural, historical, cultural and archaeological resources of the Channel Islands National Marine Sanctuary;
3. Support, promote, and coordinate scientific research on, and long-term monitoring of, Channel Islands National Marine Sanctuary resources.

⁸ The CINMS goals do not reflect NMSA purpose and policy (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. This is appropriate as a purpose of the broader NMSP, but not as a goal for an individual national marine sanctuary.

4. Where appropriate, restore and enhance natural habitats, populations and ecological processes within the Channel Islands National Marine Sanctuary;
5. Provide comprehensive and coordinated conservation and management of the Channel Islands National Marine Sanctuary, as well as the activities affecting it, in a manner complementing existing regulatory authorities;
6. Create models of and incentives for ways to conserve and manage national marine sanctuaries, including the application of innovative management techniques;
7. Facilitate to the extent compatible with the primary objective of resource protection, public and private uses of Sanctuary resources not prohibited pursuant to other authorities, and enhance such uses where they are wise and sustainable;
8. Cooperate with national and international programs encouraging conservation of marine resources; and
9. Develop and implement coordinated plans for the protection and management of the Channel Islands National Marine Sanctuary, 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 the Sanctuary's health and resilience.

These goals are carried out by CINMS in its ecosystem-based approach to management, using the best available natural and social science information.

Accomplishments

Relative to these goals, CINMS has had many major accomplishments since Sanctuary designation in 1980. The following bullets highlight some of these achievements by thematic area.

Education and Outreach

- Promotion of community involvement in Sanctuary management through the formation of the Sanctuary Advisory Council and several working groups;
- Assistance in development of the Santa Barbara Sea Center and the Outdoor Santa Barbara Visitor Center;
- Development of "Los Marineros," an acclaimed 5th grade marine education program that reached numerous classes and thousands of students per year throughout Santa Barbara County between 1987 and 2005;
- Development and rapid growth of the Multicultural Education for Resource Issues Threatening Oceans (MERITO) Program in the Channel Islands region that reaches thousands of teachers and students by integrating watershed and ocean science into public education and extended learning programs;
- Ongoing educational outreach efforts reaching more than 80,000 people per year through the distribution of publications and other products (such as the Alolkoy newsletter, Sanctuary brochures, special reports, posters, educational resource directories), as well as active participation in public programs, lectures, and events;
- Production of a state-of-the-art, content-rich web site enabling public access to a wealth of information about the Sanctuary (such as marine life, research projects, management issues, public meetings, maps and weather) and receives over 10,000 visits per month;
- Expanding regional awareness and understanding of the Sanctuary through opening of an office in Ventura County

Conservation Science

- Convening with partners the first ever comprehensive symposium on the performance of the Channel Islands marine protected area network in 2008

- Holding CINMS marine protected area (MPA) network monitoring workshop with over 100 experts and stakeholders and development of Draft Ecological and Socioeconomic Monitoring Recommendations;
- Increasing knowledge of CINMS and the surrounding environment by providing the scientific community with appropriate opportunities to use Sanctuary research vessels and aircraft;
- Development of a state-of-the-art Geographic Information System, allowing visual characterization of Sanctuary features to improve management decision making and enhance educational opportunities;
- Hosting of the Sustainable Seas Expeditions in 1999 and 2000 to conduct unique surveys (1-person submersible dives to 2000 feet) within and near the Sanctuary, including geologic and fish assessments, sidescan sonar, and characterization of the Santa Barbara Channel eddy;
- Ongoing vessel and staff support for long-term environmental monitoring programs, such as the University of California Santa Barbara's Plumes and Blooms oceanographic study (monitoring ocean color variation in the Santa Barbara Channel through water sampling and satellite data comparison) and Bight '98 and Bight '03 (regional marine monitoring surveys of marine life and water quality along the Southern California Coast);
- Collection of tens of thousands of data points on marine mammals and vessel use within CINMS through the Sanctuary's aerial monitoring program;
- Procurement of state-of-the-art research vessel *Shearwater*

Resource Threat Reduction

- Development of an MPA network in state and federal waters of the Sanctuary through a fair and open community-based process that brought together key stakeholders and the best available scientific and socioeconomic data;
- Establishment of a permanent prohibition on new oil and gas development within 6 miles of the Channel Islands since 1980;
- Reduction in air traffic disturbance to wildlife;
- Establishment of vessel traffic restrictions to help prevent large cargo vessel groundings at the islands;
- Prohibition of pollutant discharges into Sanctuary waters to preserve and protect water quality;
- Protection of hundreds of Chumash artifacts and over 150 known shipwrecks

Community Involvement and Support

- Providing opportunities for approximately 20 interns per year and hundreds of volunteers to learn about the Sanctuary, help protect its resources, and gain valuable career experience;
- Consultation with local mariners to develop ethnographic data about Sanctuary resources and uses, providing for enhanced management decision-making;
- Providing public access to sanctuary interactive kiosks (with over 40 online regional weather links) at local harbors and visitor centers;
- Annual training and deployment of a base of over 100 volunteers to provide naturalist interpretive services on whale-watching boats and island hikes (Channel Islands Naturalist Corps).

Although these accomplishments constitute major successes for the Sanctuary, new management issues have emerged, existing management issues have changed, and CINMS continues to adapt its management actions to build on these successes and best protect the Sanctuary's resources while allowing compatible resource use. This is accomplished through the management plan review process.

CINMS Management Plan Review

The Management Plan Review Process

Management plan review, which is required by the NMSA (16 U.S.C. 1434(e)) for all national marine sanctuaries, is conducted to ensure each site conserves and protects its living and historical/cultural resources. Management plans are sanctuary-specific documents describing regulations and boundaries, outline staffing and budget needs, present management actions and performance measures, and guide development of future budgets and management activities.

The management plan review process is based on three fundamental steps: 1) public scoping meetings; 2) the prioritization of issues and development of action plans; and 3) the preparation of draft and final management plans and the relevant NEPA documentation (such as an Environmental Impact Statement or Environmental Assessment). Public comments on the draft plan help staff revise the document into a final management plan outlining the Sanctuary's priorities for the next five to ten years.

Revisiting the 1983 Management Plan

The previous management plan for CINMS was published in 1983. Since then, many things have changed at the Sanctuary. Whereas the population of southern California⁹ was approximately 13.5 million in 1980 (U.S. Census Bureau 1995), population levels now reach nearly 20 million, including over 1.1 million in Santa Barbara and Ventura counties (U.S. Census Bureau 2000a). This represents a regional increase in population of approximately 43%. Coupled with population growth continuing urbanization of the region has increased pressures on CINMS marine resources. Increasing, shifting, and new uses of the marine environment have made Sanctuary management more complex and challenging.

Advances in resource management techniques and tools have also occurred over the last 25 years. As such, CINMS has developed a more sophisticated understanding of the Sanctuary's natural and human environment while coming to the realization much of the existing management plan is outdated. As such, the Sanctuary began the review of its management plan by initiating the scoping process and soliciting the views of a wide variety of regional interests to determine the most current, relevant, and high-priority resource management issues for the Sanctuary.

The Sanctuary Advisory Council

In December 1998, CINMS convened a 20-member Sanctuary Advisory Council to provide guidance and offer advice to the Sanctuary Superintendent. Today, the Advisory Council includes 10 voting government agency seats and 11 voting community stakeholder seats (with an alternate for each seat) and provides a platform for public input into the management of the Sanctuary. Throughout the entire management plan revision process, this partnership with the Advisory Council has allowed CINMS to build on and use unique knowledge and resources the private sector and other agencies have to offer. The Advisory Council has participated in every step of the management plan review process, including the public scoping meetings. The Advisory Council has also been an effective body for drawing in public participation and building a shared understanding of Sanctuary management through open discussion and collaborative efforts.

Scoping

CINMS began review of its existing management plan in 1998. Seven public scoping meetings were held throughout the region, from San Luis Obispo in the north to Long Beach in the south (one meeting was

⁹ Defined for purposes of deriving U.S. census population estimates contained within this management plan as the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura.

also held in Washington, D.C.). A wide range of local, regional and national resource management issues were raised and out of these emerged several general issue categories. These issue categories were further analyzed and refined as staff worked with the Sanctuary Advisory Council to identify specific resource management issues. These issues and concerns are addressed in the action plans and in the Final Environmental Impact Statement.

The Environmental Impact Statement (EIS)

The basic elements of an environmental impact statement include: the purpose and need for the proposed action, a description of alternatives including the proposed action, the affected environment and the environmental consequences of the alternatives (the alternatives analysis). In the case of the CINMS management plan, the requirement to prepare an EIS was triggered by the process of proposing revisions to the terms of designation of the Sanctuary. The EIS focuses on presenting and analyzing changes to Sanctuary regulations.

When a federal agency prepares an EIS, it must first define its study area - a geographic range within which resources, uses and management issues are analyzed. CINMS staff conducted a review of the various components making up the Sanctuary ecosystems, such as the range of species found within the Sanctuary, the distribution of habitats, oceanographic processes, and the geographic scope of human threats to Sanctuary resources. This review revealed that many key species and habitats, as well as important ecosystem processes (*e.g.*, upwelling areas, currents, and gyres) extend beyond the boundaries of the Sanctuary. Building upon the staff's work, in the fall of 1999, the Sanctuary contracted Dr. Michael McGinnis to recommend a study area for the management plan review. Dr. McGinnis produced his findings "A Recommended Study Area for the CINMS Management Planning Process: Ecological Linkages in the Marine Ecology from Point Sal to Point Mugu" in January 2000. Subsequently, in 2000, Sanctuary staff discussed Dr. McGinnis' recommendations with the Sanctuary Advisory Council and Sanctuary stakeholders, and determined a final study area.

Given the geographic range of Sanctuary resources, and the scope of human activities occurring throughout the Santa Barbara Channel, the study area extends from the current Sanctuary boundary to the mainland coast, approximately from Point Sal to Point Dume.¹⁰ The study area encompasses portions of the two bioregions within the northern Southern California Bight and includes additional ecosystem qualities and attributes providing support services to Sanctuary resources. (See Figure 5.)

At the January 20, 2000 Advisory Council meeting, the Sanctuary announced it had selected Tetra Tech, Inc. to develop the draft EIS (DEIS) based on the study developed and approved by the Advisory Council. Through the Advisory Council, CINMS regularly updated the public on the progress and development of the DEIS, which analyzed a range of alternatives for modified and new Sanctuary regulations.

In 2008, NOAA completed a supplemental DEIS (SDEIS) containing an analysis of further modifications proposed for the Sanctuary's discharge/deposit regulation, thereby revising the discharge regulation changes proposed in the DEIS. The SDEIS analysis addressed regulation of sewage and graywater discharges/deposits from vessels 300 GRT or more.

¹⁰ A similarly sized study area was also developed during the 1980 Sanctuary designation process.

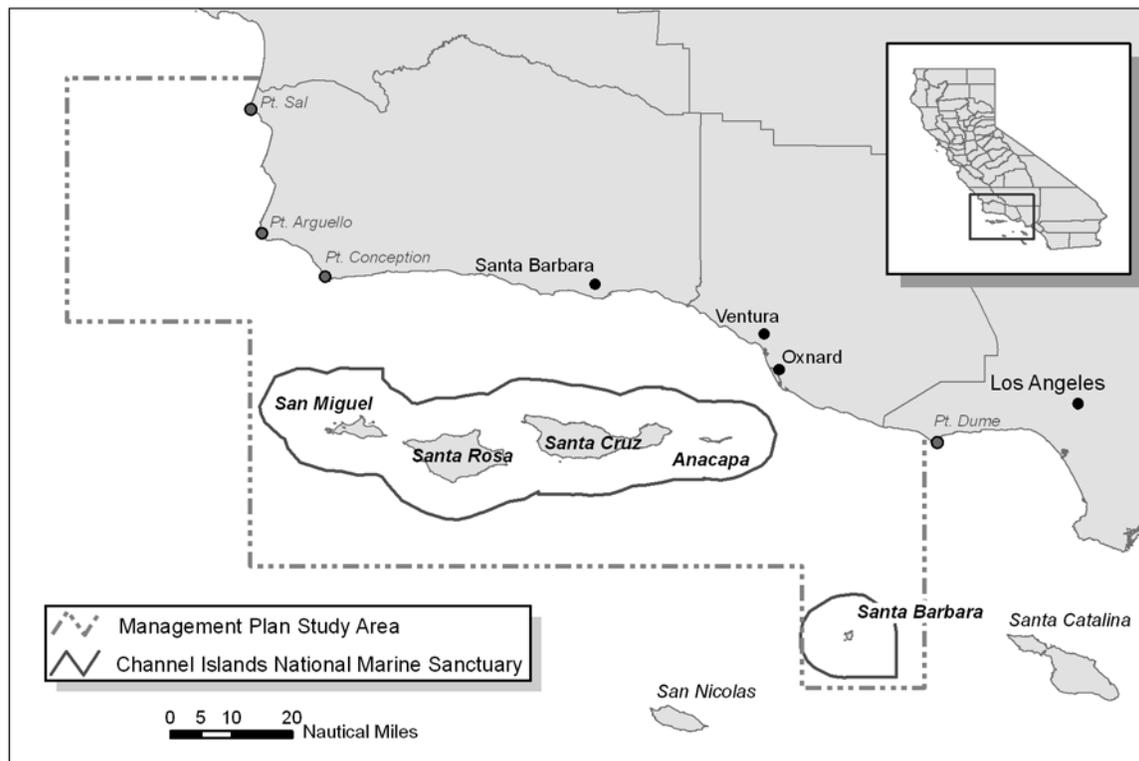


Figure 5. CINMS Management Plan Review Study Area

Applying Science, Socioeconomics, and Local Knowledge

Once the study area was defined, CINMS focused its evaluation of the natural resources and human activities associated within this defined area. In addition to input from the general public and the Sanctuary Advisory Council, Sanctuary staff relied on three strategic tools to assist in the development of actions for the revised management plan: science, socioeconomics, and local knowledge.

- **Science:** Scientific research and monitoring programs provide information for the Sanctuary to better understand and evaluate the effectiveness of management programs and policies. As a result, science has helped CINMS better measure, understand and predict change in the Sanctuary ecosystems. CINMS has collected data from individual researchers, institutions, and state and federal agencies, and, where possible, integrated it into a geographic information system (GIS) to help more clearly identify Sanctuary marine resources, habitats, and physical and geological features.
- **Socioeconomics:** Recognizing ecosystem sustainability and economic health are mutually beneficial, CINMS staff considered both the potential negative impacts that may be caused by management restrictions on income-generating activities, net economic user values, and the potential public benefits derived from long-term protection of nationally significant resources. A socioeconomic analysis considering impacts to user groups from proposed actions in this revised management plan is contained in the FEIS (Volume II, Section 4.0).
- **Local Knowledge:** CINMS recognizes local citizens' understanding and respect of the regional environment. Many of the community partners involved in the development of this management plan have been in and on the waters of the Sanctuary for up to a half-century and their knowledge can be more extensive than available scientific research. In addition, community voices represent

local interests, issues and concerns. As such, the local mariners interviewed in 2000 for a CINMS Ethnographic Data Survey (Kronman 2000a), the general public and the Advisory Council have all provided invaluable information used to develop this revised management plan.

Developing the Action Plans

Action plans are the means by which the NMSP identifies and organizes the wide variety of management tools it employs to manage and protect its marine resources. Action plans allow the NMSP to articulate the programs, projects and regulations it uses to address the resource issues identified for this management plan and to fulfill the purposes and policies of the NMSA. The action plans in this document were developed by the CINMS staff with input from the Advisory Council and the general public. In general, they are designed to address:

- The management issues identified during the management plan review process;
- The goals and objectives of the NMSA;
- Extensive comments, input and ideas from the Sanctuary Advisory Council;
- The scientific, socioeconomic and local knowledge gathered about the status of Sanctuary resources and resource management issues;
- The unique, non-duplicative, and beneficial services CINMS can offer to improve resource management; and
- The need for determining Sanctuary effectiveness over time.

The action plans are in Section III of this document. Section II: The Sanctuary setting, which follows, describes various aspects of the CINMS regional ecosystems and human uses of the Sanctuary.¹¹ It also provides information on Sanctuary administration and management organization.

Public Comments / Finalizing the Management Plan and EIS

This management plan and the Final EIS are the result of finalizing the draft documents per responses to public and agency comments, and minor changes made by Sanctuary staff. In May 2006, NOAA released the draft management plan and DEIS for public review and comment. NOAA received over 600 comments from individuals, organizations, and government agencies. In March 2008, NOAA released for public review and comment a supplemental DEIS (SDEIS) containing an analysis of further modifications proposed for the Sanctuary's discharge/deposit regulation. The SDEIS analysis addressed regulation of sewage and graywater discharges/deposits from vessels 300 GRT or more. NOAA has addressed all substantive public and agency comments from 2006 and 2008, and where appropriate has revised the management plan and EIS according to responses to comments. Public and agency comments received during the 2006 and 2008 public comment periods, and NOAA's responses to these comments, are provided in Vol. II, Appendix B.

In addition to revising the management plan and EIS per responses to comments, Sanctuary staff have made minor revisions to update outdated information, and to correct minor typographical, technical, and formatting errors. Vol. I, Appendix C and Vol. II, Appendix B contain information about changes made to the management plan and EIS, respectively, between Draft and Final versions.

¹¹ For an in-depth analysis of many of these features, see Section 3.0 in the Final Environmental Impact Statement.

SECTION II: THE SANCTUARY SETTING



Figure 6. San Miguel Island (Glenn Allen)

This section describes the Channel Islands National Marine Sanctuary setting in four parts:

- *Part II-A: The Physical Setting* describes the Sanctuary's geology, meteorology, oceanography, watersheds, bioregions and habitats;
- *Part II-B: The Biological Setting* describes marine plant and animal life;
- *Part II-C: The Human Setting* describes human activities occurring in and near the Sanctuary; and
- *Part II-D: The Operational Setting* the Sanctuary's administrative structure, infrastructure, intra and inter-agency relationships, tools for formalizing relationships, funding mechanisms, and enforcement and permitting procedures.

A description of the Sanctuary environment is also located in the FEIS (Vol. II, Section 3.0).

PART II-A: THE PHYSICAL SETTING

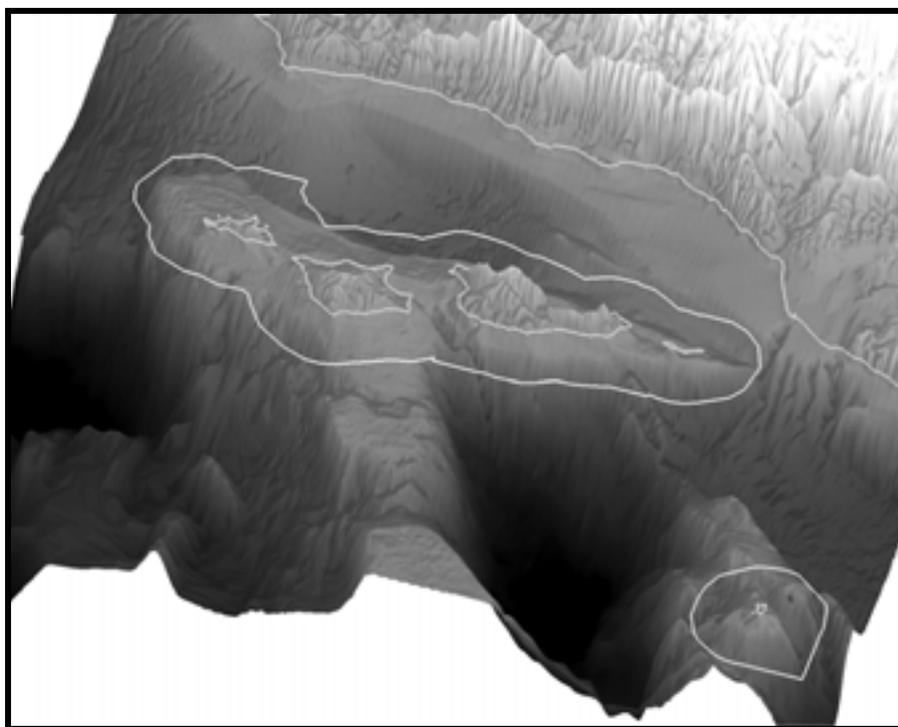
The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six nmi from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (the Islands). The Sanctuary resides within the upper portion of the Southern California Bight (SCB), which is formed by a transition in the California coastline wherein the north-south trending coast begins to trend east to west. The SCB stretches from Point Conception in the north to Punta Eugenia (Mexico) in the south (Dailey *et al.* 1993). A detailed characterization of the physical and biological setting of the Sanctuary is found in CDFG (2002) and NCCOS (2005).

Geology

Geologic features usually consist of formational, depositional and volcanic rocks, unique landforms, tectonic features and fossils. In coastal and marine settings, sediments are also considered part of the geology.

The Channel Islands are all located within a unique, 300-mile long oceanographic region known as the “Continental Borderland” (Norris and Webb 1990). Unlike most wide continental shelves, which are gently sloping platforms interrupted by low banks and occasional canyons, the Continental Borderland is a region of basins and elevated ridges. Regions and basins in the Channel Islands region are shown in the bathymetric map in Figure 7. The Channel Islands are the ridge portions rising above sea level. The

highest point in the Channel Islands is the 2,450 foot Picacho Diablo on Santa Cruz Island.



Lying parallel between the California coast and the Channel Islands is the 1,950-foot deep Santa Barbara Basin. Other regional basins range in depth from 1,650 to 8,250 feet. The seaward edge of the Continental Borderland (known as the Patton Escarpment) descends 13,200 feet to the deep ocean floor (Norris and Webb 1990).

Figure 7. Bathymetric map of the Channel Islands

Oil and Natural Gas

More than 20 oil fields and several natural gas fields lie beneath the Santa Barbara Channel. Most are close to the mainland and several are accessed from offshore oil and gas platforms (Norris and Webb 1990). There are more than 40 naturally occurring oil and gas seeps in the Santa Barbara Channel (Norris and Webb 1990). The rate of oil seepage from the South Ellwood anticline (located about 1.62 nautical miles offshore in the Santa Barbara Channel) is one of the highest in the world. The dissolved hydrocarbon plume extends several km down-current from the vents (Washburn *et al.* 1996).

Meteorology

The Channel Islands region has a Mediterranean climate characterized by mild winters (when most rainfall occurs) and warm, dry summers. The climate is dominated by a strong and persistent high-pressure system frequently off the Pacific coast (generally referred to as the “Pacific High”). The Pacific High shifts northward or southward in response to seasonal changes or the presence of cyclonic storms. In its usual position to the west of Santa Barbara County, the Pacific High produces an elevated temperature inversion. Coastal areas are characterized by early morning southeast winds, which generally shift northwest later in the day. Transport of cool, humid marine air onshore by these northwest winds produces frequent fog and low clouds near the coast, particularly during nighttime and morning hours in the late spring and early summer months.

The most important climatic and meteorological characteristics influencing air quality in the region are the relatively consistent temperature and the predominance of onshore winds, topography and solar irradiance.

Oceanography

Offshore circulation results from the interaction of large-scale ocean currents, local geography, and the unique basin and ridge topography of the ocean bottom in the Southern California Bight. The California Current is a major ocean current that moves through the Sanctuary region, staying largely to the west of the islands, but influencing the circulation patterns in the region. Year round, this current brings cold water from upwelling centers along the California coast.



*Figure 8. Forney's Cove, Santa Cruz Island
(Adrian M. Wenner)*

At Point Conception, where the coastline turns east, the California Current moves farther offshore as it continues its southward flow. Near the U.S.- Mexican border the California Current turns east and then north, and flows back up along the coast bringing warm water into the Santa Barbara Channel. This directional shift creates a large eddy known as the Southern California Countercurrent or the Southern California Eddy (Hickey 2000a). At the eastern end of the Channel Islands, the Southern California Countercurrent separates into two parts. One part flows northwestward through the Santa Barbara Channel; the other part flows westward south of the Channel Islands. The California Current and Southern California Countercurrent are both strongest in the summer (Hickey 1993). During the spring, the countercurrent disappears and surface flow throughout the SCB tends to be southward (Hickey 1993). The timing, duration and intensity of upwelling events is driven by seasonal variations in wind direction and climatic variability associated with events such as El Niño. In general, upwelling period begins in

March, when westerly winds prevail, and continues until September, when the winds die down (California Coastal Commission 1987).

Upwelling (circulation patterns in which deep, cold, nutrient-laden water moves towards the surface) often occurs where these currents meet. Upwelling currents influence circulation in the Sanctuary region. These currents are the result of prevailing winds and the orientation of the coastline. Along the north-south oriented coast of California, winds blowing from the north move surface water westward, away from the coastline, and create upwelling currents that bring colder water to the surface.

Point Conception is the southernmost major upwelling center on the west coast of the United States, and marks a transition zone between cool surface waters to the north and warm waters to the south (Love *et al.* 1999). However, upwelled water from regions north of the SCB appears to enter the western end of the Santa Barbara Channel and move eastward along its southern boundary (Hickey 2000a). Between the islands and the mainland, these currents create a localized cyclonic gyre that can vary in intensity seasonally based on current and wind speed (Hendershot and Winant 1996, Harms and Winant 1998, Winant *et al.* 2003). These varying conditions create alternate states of upwelling, where cool nutrient-rich water is brought from deeper areas to the photic zone at the surface, and relaxation, when upwelling ceases (Winant *et al.* 2003). Regional upwelling is wind-driven and provides the nutrients and conditions for phytoplankton and zooplankton to thrive, with effects seen throughout the food chain.

Watersheds

A watershed is the area of land where all water under it or draining off of it goes into the same place. There are a number of watersheds located on the northern Channel Islands, contributing a small amount of fresh water into the Sanctuary. Most fresh water entering the Sanctuary region, however, comes from the streams and rivers along the mainland coast, such as the Santa Clara and Ventura which provide the majority of the freshwater and sediments into the Santa Barbara Channel. The Santa Ynez and Santa Maria rivers provide major drainages north of Point Conception. These major rivers have been shown to transport sediment plumes that reach the Sanctuary.

The regional coastal mainland also includes the San Antonio Creek watershed and 41 small coastal watersheds on the south side of the Santa Ynez Mountain Range. The creeks of these watersheds provide important nutrients to the marine environment (as well as pollution from agricultural and urban runoff).

Bioregions

Bioregions are distinct areas characterized by differences in the assemblages of species present. In the Channel Islands region, there are two distinct bioregions and a transition zone: 1) the cold water Oregonian Province; 2) the warm water Californian Province; and 3) a transition zone between the two. Point Conception is often identified as marking the general boundary between the two bioregions (NCCOS 2005). Changes in the ecology of the bioregions are influenced by hydrographic conditions in the Southern California Bight and ocean-climate variability.

The Oregonian Province is characterized by the cold waters of the California Current and encompasses San Miguel Island, Santa Rosa Island, and part of northern Santa Cruz Island. It extends northward along the coast of California, Oregon, and Washington. The Californian Province is characterized by warm water of the California Counter Current and extends south along the coast of California and Mexico. Species characteristic of the Californian Province occur around Anacapa Island and the east end of Santa Cruz Island. The transition between the two bioregions, which is characterized by mixed water from both bioregions, is dynamic, where persistent thermoclines may shift tens of miles in response to annual to inter-annual variability caused by events such as El Niño-Southern Oscillation (ENSO) (McGowan *et al.* 1998). The transition zone supports a unique assemblage of species from both bioregions and typically encompasses south Santa Rosa, south Santa Cruz, and Santa Barbara islands.

Habitats

There are a wide variety of marine habitats in the Sanctuary. Some of the key habitats are summarized here, while complete details and a comprehensive list of habitats are found in the FEIS (Vol. II, Section 3.0) and in CDFG (2002).

Kelp Forest Habitat

Giant kelp, a keystone species, forms extensive underwater beds on rocky substrates (except *M. angustifolia* which coast occurs on sand) at shallow subtidal depths (9.9 to 99 feet) throughout the Sanctuary region. These impressive, underwater forests are conspicuous features of the Sanctuary and important not only to the regional ecology, but to recreational and commercial interests as well. Individual kelp fronds live only about 6 months (during which they may grow 99 feet or more in length), but new fronds are continually produced during the several year life span of the plant (Rosenthal *et al.* 1974).

Kelp beds in the Sanctuary are productive habitats that provide food, attachment sites, and shelter for a myriad of invertebrates and fishes. The dense thicket of kelp in the water column and at the surface is particularly important as a nursery habitat for juvenile fishes (Carr 1989). Locations supporting kelp generally have been consistent through time, but the extent of these beds has varied considerably based on environmental conditions such as water temperature and natural predation. Greater habitat heterogeneity at the Islands has resulted in increased kelp forest species diversity compared to mainland kelp beds (Murray and Bray 1993).

Surfgrass and Eelgrass Habitat

The two types of marine flowering plants found in the Sanctuary, surfgrass and eelgrass, form dense beds on different substrate and in different conditions. Surfgrass beds are highly productive and complex microhabitats that support a wide variety of marine species. Eelgrass beds are also known to be



Figure 9. Kelp forest habitat
(Dean DePhillipo)

ecologically important for primary production, nutrient cycling, and substrate stabilization (Phillips 1984). Eelgrass provides habitat and food for a unique assemblage of plants, invertebrates, and fishes (den Hartog 1970; McConnaughey and McRoy 1979; Phillips 1984). The diversity of conspicuous plant, invertebrate, and fish species was nearly twice as high within eelgrass beds as on surrounding sand habitats (Engle *et al.* unpublished data).

The largest beds of eelgrass in the Sanctuary occur at Smugglers Cove, Canada del Agua, and Prisoners Harbor on Santa Cruz Island and at Bechers Bay on Santa Rosa Island. Moderate beds are found at Scorpion and Forney coves on Santa Cruz Island and at Johnsons Lee on Santa Rosa Island. A few small patches of eelgrass exist at Cathedral Cove and Cat Rock on Anacapa Island and at Yellowbanks Anchorage on Santa Cruz Island. The single patch at Cathedral Cove is the only known remnant of once widespread beds scattered along the north side of Anacapa Island.

Intertidal Zone Habitats

Intertidal zones consist of a variety of coastal habitats periodically covered and uncovered by waves and tides. This transition zone between sea and land is the strip of shore ranging from the uppermost surfaces wetted during high tides to the lowermost areas exposed to air during low tides. Tidal heights within the Channel Islands can be as high as 9.9 feet during full or new moon periods. On surf-swept rocky cliffs, the wave splash can extend water upward of another 17 feet or more.

Intertidal habitat within the Sanctuary is composed of approximately 94.5 miles of rocky coastline interspersed with approximately 47 miles of sandy beaches (California Resources Agency, CDFG 2002). Rocky shores support a rich assortment of plants and animals, including numerous green, brown, and red algae, as well as beds of surfgrass. A wide variety of sedentary invertebrates, including barnacles, limpets, and mussels compete for space with the plants in the intertidal zone. Mobile invertebrates, such as snails and crabs, often hide in crevices or under rocks, then emerge to graze on plants or prey on other animals. These intertidal organisms withstand varying degrees of wave shock, dramatic temperature changes, desiccation, and attacks from terrestrial predators.

Fishes in intertidal habitats are limited to tidepools or passing through the intertidal zone at high tide. Seabirds forage in the intertidal at low tide while some roost in aggregations on cliffs just above the shore. Seals and sea lions depend on many of the Sanctuary's intertidal shores for hauling out, especially at San Miguel and Santa Rosa Islands.

Nearshore Subtidal Habitat

Subtidal habitats include those marine habitats ranging from the lower limit of the intertidal zone down to 99 feet. Nearshore subtidal habitats include mud, sand, gravel, cobble, and bedrock substrates are subject to dynamic physical processes, including wave exposure, coastal currents, upwelling, suspended sediments and variability in temperature, salinity and nutrients.

Nearshore subtidal rocky habitats at the Islands are widespread, especially high relief volcanic reefs with walls, ledges, caves, and pinnacles. Typical shallow subtidal areas in the Sanctuary contain assemblages of plants, invertebrates, and fishes, with giant kelp dominating. However, many shallow reefs grazed by sea urchins have less giant kelp and greatly reduced species diversity. Deeper reefs have well developed invertebrate cover, including sponges, sea anemones, sea fans, plume worms, bryozoans, and tunicates. Some low-relief nearshore habitats in high current areas are dominated by large numbers of brittle stars or sea cucumbers. Low-relief sedimentary reefs exist as well, particularly on Santa Rosa Island.

Many sandy nearshore habitats in the Sanctuary have relatively steep slopes composed of coarse shelly debris. Stable sand habitats with fine grain sediments are generally limited to sheltered coves at canyon

mouths, such as those found around Santa Cruz Island. A few of these locations have well-developed eelgrass meadows. Many other sandy habitats consist of patches of shelly sand between rock reefs, forming mosaics of hard and soft substrata.

Deep Water Benthic Habitat

Beyond nearshore subtidal depths are deep-water habitats extending from 99 to greater than 660 feet deep. Well over 90 percent of deep-water benthic habitats in the Sanctuary consist of fine sands in shallower portions, grading into silt and clay-dominated sediments in deeper portions (Science Applications International Corporation 1986; Thompson *et al.* 1993). These soft-bottom particulates are derived from terrestrial runoff and decaying plankton. Coarse sediments occur near Point Conception, and north of San Miguel Island (Blake and Lissner 1993). Fine sediments occur on the sill at the western end of the Santa Barbara Channel, and in the Santa Barbara Basin.

Deep rock bottoms often are located offshore from major headlands and islands, and on the highest parts of undersea ridges, banks, and pinnacles. High relief pinnacles and ridges occur in some areas, such as off the northwest end of San Miguel Island.

Because light rapidly disappears below 165 foot depths, offshore benthic habitats do not support marine plants. Invertebrates can, however, be found in these habitats and include sponges, anemones, cup corals, black coral, sea fans, bryozoans, feather stars, brittle stars, sea stars, and lamp shells. Demersal fishes are common, especially various species of rockfishes.

Water Column Habitats

Water column, or pelagic, habitats consist of discrete portions of ocean waters categorized by variation among multiple factors, such as light penetration, temperature, oxygen concentration, and density. Based on variation among these factors the water column is divided into numerous vertical and horizontal sub-habitats.



Figure 10. Schooling fish within the photic zone (Stuart Westmorland)

Major vertical zones within the water column begin at the ocean surface with the microlayer, a fine film of organic molecules. Next, the photic zone, from the surface to a depth of approximately 660 feet, is the portion of the water column in which there is sufficient light for photosynthesis. Within the photic zone there is an important temperature and density gradient called the pycnocline that separates warm, mixed surface water from cool, dense water below. The surface water may reach depths between approximately 130 to 330 feet or more. Below the photic zone lies the mesopelagic zone, from approximately 660 to 3,300 feet, and

the bathypelagic zone, from approximately 3,300 to 11,500 feet. Water column habitats within the majority of the Sanctuary do not extend deeper than the mesopelagic zone, though the southern reaches of the Sanctuary boundary near the mouth of Santa Cruz Canyon (a submarine canyon between and offshore

from southeastern Santa Rosa Island and southwestern Santa Cruz Island) approach bathypelagic depths. In general, horizontal variation in water column habitats occurs from the coast to the open ocean, within currents, at differing latitudes, and among gyres.¹² (Thorne-Miller 1999).

Pelagic organisms are highly diverse and many have interesting and unique traits. Pelagic organisms living in the water column are classified as either plankton (passive drifters moving with the water) or nekton (actively swimming organisms). Some of these organisms are found exclusively in the microlayer, while some occupy it only for a part of their life history (*e.g.*, as eggs and larvae), and others are found in the microlayer and other water column zones. The photic zone represents the range limit of phytoplankton, microscopic marine plants requiring light to synthesize their food. Many of the organisms living in the mesopelagic and bathypelagic zones produce light biochemically for such purposes as attracting prey, or disorienting predators. In general, the mesopelagic zone has the greatest species diversity of pelagic fish. (Thorne-Miller 1999).

¹² Circular motions of water that occur in each of the major ocean basins and are centered on subtropical high-pressure regions. Gyres rotate clockwise in the northern hemisphere and counterclockwise in the southern hemisphere.

PART II-B: THE BIOLOGICAL SETTING

The waters swirling around the five islands within CINMS combine warm and cool currents to create an exceptional breeding ground for many species of plants and animals. Forests of giant kelp are home to numerous populations of fish and invertebrates. Every year over 27 species of whales and dolphins visit or inhabit the Sanctuary including the rare blue, humpback and sei whales. On the islands, seabird colonies and pinniped rookeries flourish while overhead brown pelicans and Western gulls search the water for food. This part of Section II describes some of the species of marine plants and animals inhabiting the Sanctuary; for a more complete description, see FEIS (Vol. II, Section 3.0 - Affected Environment).

Plankton

Plankton, single celled marine plants (phytoplankton) and animals (zooplankton), form the base of the food web. Many species of plankton inhabit the Sanctuary and marine life is highly dependent on their growth and productivity. Their numbers, biomass, and production vary greatly both spatially and temporally.

Marine Plants

Marine plants of the Sanctuary are made up of algae and seagrasses. Diversity of marine plants is greater in the SCB and the Channel Islands than along coastal central California. In the SCB, there are at least 492 species of algae and 4 species of seagrasses known to occur of the 673 species described for California (Abbott and Hollenberg 1976; Murray and Bray 1993).

The Channel Islands are transitional, with each island having its own ratio of southern to northern species of marine plants. Although conditions are dynamic, a general pattern emerges: Santa Barbara Island is inhabited by southern species, Anacapa and Santa Cruz islands are intermediate with both southern and northern components, while Santa Rosa and San Miguel islands are populated primarily with northern species (Murray and Littler 1981).

Invertebrates

Benthic invertebrates include species from nearly all phyla of invertebrates living in (infauna) or on (epifauna) the sea floor during most of their lives, though most also have pelagic larvae. Benthic invertebrates may also be characterized as “sessile” (attached or sedentary) or “motile” (free-moving). They range in size from little known microscopic forms (micro-invertebrates) to the more common larger organisms (macro-invertebrates). Pelagic invertebrates (*e.g.*, jellyfish and squid) also exist in the Sanctuary water column.

The Channel Islands support a wide variety of invertebrates due to their transitional location between cold and warm bioregions and diversity of substrates. The substrates include sheltered and exposed coasts at depths from the intertidal to deep slopes, canyons and basins (Thompson *et al.* 1993). The total number of species may well be in excess of 5,000, not including microinvertebrates (Smith and Carlton 1975; Straughan and Klink 1980).



Figure 11. Market squid (MBNMS)

Select invertebrates in the Sanctuary include multiple species of corals, prawns, spiny lobster, crabs, sea urchins, sea cucumbers, sea star, abalone, nudibranchs, scallops, mussels, squid, clams, barnacles, snails, salps, tunicates, jellyfish, sea slugs, and anemones. White abalone is protected by the Endangered Species Act (ESA).

Fish

About 481 species of fish inhabit the Southern California Bight (Cross and Allen 1993). The great diversity of species in the area occurs for three principal reasons: 1) the ranges of many temperate and tropical species extend into and terminate in the SCB; 2) the area has complex bottom topography and a complex physical oceanographic regime that includes several water masses and a changeable marine climate (Cross and Allen 1993; Horn and Allen 1978); and 3) the islands and nearshore areas provide a diversity of habitats including soft bottom, rock reefs, extensive kelp beds, and estuaries, bays, and lagoons.

The fish species found around the Channel Islands generally are representative of fish assemblages occurring along the southern California coast, with the addition of some central California species (Hubbs 1974). Abundance of fish assemblages is greater at the northern Channel Islands than at nearby coastal regions of the southern California mainland. Regional upwelling carries nutrient-rich waters from canyons and island shelf areas to surface waters. This results in increased primary productivity and large zooplankton populations, which support abundant populations of small schooling species, such as the northern anchovy, Pacific saury, sardine and mackerel. Larger pelagic (open water) fish prey upon these small schooling species, and together they form a significant contribution to the diet of marine mammals and birds. Island-associated pelagic fish are commonly consumed by pinnipeds and tooth whales.

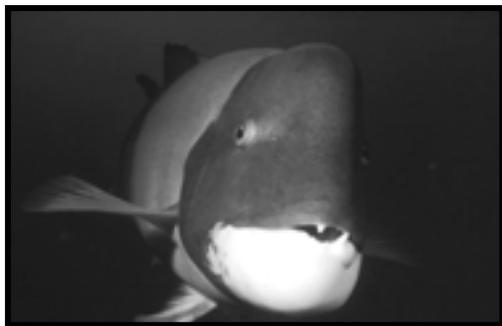


Figure 12. *California sheephead (CINMS)*

Fishes commonly found in the Sanctuary include: albacore, anchovy (northern), barracuda (Pacific), bass (various species), bat ray, blacksmith, bocaccio, bonito (Pacific), brown smoothhound, butterfish (Pacific), California scorpionfish, cabezon, California sheephead, California moray, California flyingfish, California halibut, croaker, (various species), eel, monkeyface, garibaldi, goby (various species), greenling (various species), grunion, gunnel, hake, Pacific half moon, horn shark, jacksmelt, kelpfish (various species), mackerel (various species), northern ronquil, ocean sunfish, opah, opaleye, orangethroat pikeblenny, queenfish, reef perch, rock wrasse, rockfish (various species), ronquil, stripedfin, salmon (king), sanddab, sarcastic fringehead, sardine (Pacific), sargo, saury, Pacific sculpin, seaperch (various species), señorita, shark (various species) silversides, sole (various species), spotted cusk-eel, surfperch (various species), swordfish, thornback, topsmelt, tube snout, turbot (various species), white sea bass, whitespotted greenling, yellowfin fringehead, and zebra perch.

Sea Turtles

Four species of sea turtles have been reported in the offshore southern California region: green, loggerhead, olive ridley, and leatherback (Cordaro 2003). Most information on sea turtle distribution in southern California is based on stranding data. This stranding data indicates all four species of sea turtle may be found within the Sanctuary at any time of year (Cordaro 2003). All sea turtles are protected by the ESA.

Seabirds

Over 195 species of birds use open water, shore, or island habitats in the Southern California Bight (Baird 1993). The Channel Islands region is located along the Pacific Flyway, a major migratory route for birds, and acts as a stopover during both north (April through May) and south (September through December) migrations. The months of June and July are peak months for transient shorebirds (Lehman 1994). The diversity of habitats provided both on- and offshore also contributes to the high species diversity in the region. Sandy beaches provide foraging and resting habitat for a number of shorebirds including Black-Bellied Plover, Willet, Whimbrel, Long-billed Curlew, gulls, and sanderlings.

The upland portions of the beach provide kelp deposits that attract invertebrates where Black and Ruddy Turnstones, dowitchers, and other shorebird species forage. Several bird species within Sanctuary region have special status (of concern, threatened or endangered) under federal or state law. The Sanctuary provides important habitat for eight seabirds with special status under federal or state law: Ashy storm-petrel, Black storm-petrel, California brown pelican, California least tern, Double-crested cormorant, Rhinoceros auklet, Western snowy plover, and Xantus's murrelet.



Figure 13. *Western Gull (CINMS)*

Marine Mammals

There are three marine mammal groups in the Sanctuary: 1) whales, dolphins and porpoises (cetaceans); 2) seals and sea lions (pinnipeds); and 3) the southern sea otter.

Cetaceans live their entire lives at sea, while pinnipeds come ashore periodically to rest, breed, bear young, or molt. Pinnipeds depend on several haulout and rookery sites throughout the Channel Islands. In California, sea otters normally spend their entire lives at sea, though some do haul out on land. All marine mammals are protected under the Marine Mammal Protection Act of 1972 (MMPA). In addition, some marine mammals are protected under the federal and state ESA. Species with special protected status are listed in CDFG (2002).

The abundance and distribution of marine mammals is an important indication of the general health and ecological integrity of the Sanctuary. Marine mammals feed on fishes and invertebrates, which feed on other marine life of the Channel Islands region. The distribution and abundance of marine mammals depend on healthy marine habitats, such as kelp forests and associated rocky reef ecosystems.

Whales Dolphins And Porpoises

At least 33 species of cetaceans have been reported in the Sanctuary region (Leatherwood *et al.* 1982; Leatherwood *et al.* 1987). Most of the reports involve live sightings although a few are known only from strandings. Common species found in the Sanctuary include: long-beaked common dolphin, short-beaked common dolphin, Bottlenose dolphin, Pacific white-sided dolphin, Northern right whale dolphin, Risso's dolphin, California gray whale, Blue whale, and Humpback whale. In winter and spring during the gray whale migrations, orcas are frequently reported in the region.

Seals and Sea Lions

The productive waters and relatively undisturbed environment of the Sanctuary provides vital habitat for pinnipeds, offering important feeding areas, breeding sites, and haul outs. Three species commonly found throughout or in part of the Sanctuary are the California sea lion, northern elephant seal, and Pacific harbor seal. Rare or uncommon species sighted within the Sanctuary include the northern fur seal, Guadalupe fur seal, and Steller sea lion.



Figure 14. Elephant seal, San Miguel Island
(Robert V. Schwemmer)

Sea Otters

Sea otters were common in the Channel Islands until prolonged periods of hunting led to local extinction at the Islands and severe depletion along the mainland California coast. An international treaty banning sea otter hunting was established in 1911 in order to protect the few remaining individuals. The California population slowly increased from a remnant colony off Bixby Creek in central California, which was discovered in 1937.

The population slowly increased until the 1970s, when it began to decrease as a result of entanglement mortality due to fishing gear. Once state regulations addressed the entanglement issue, the population began to increase again until a decrease was observed once again in the mid 1990s. Annual population counts steadily decreased through 1999 (Tinker *et al.* 2006). The cause of that population decline is not known, but mortality sources can include disease, shark attacks, shooting, entanglement in fishing gear, and starvation. In recent years, the population has shown fluctuations in both pup and independent sea otter population size (USGS Census reports). The 2007 USGS Western Ecological Research Center sea otter spring survey found 106 independent sea otters and zero confirmed pups south of Point Conception.

Although the long-term status of the population is unclear, the geographic range of the population has expanded to the north and south. The recovering California stock of sea otters now generally ranges from Point Conception north to Año Nuevo Island, in Santa Cruz County. From 1987 to 1990, the USFWS, which has primary jurisdiction over sea otters, translocated 140 otters to San Nicolas Island, though as of 2004 only 32 otters (excluding dependent pups) were counted at the Island (USFWS 2005). Following the translocation rare sightings of sea otters in the Sanctuary have been reported. In 2005, the USFWS issued a supplemental environmental impact statement (SEIS), supplementing the 1987 statement that originally evaluated the translocation program, in which they 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. While sea otters have not yet recolonized areas within the Sanctuary, they would likely eventually reestablish their range within Sanctuary boundaries (USFWS 2005). Sea otters are not expected to have an effect on the Sanctuary within ten years (USFWS 2005). The southern sea otter is listed as threatened under the federal ESA and fully protected under California state law.

PART II-C: THE HUMAN SETTING

For 13,000 or more years before European contact, the ancestors of today's Chumash peoples lived and thrived on the Channel Islands and surrounding waters that we now call a National Park and National Marine Sanctuary. In early historic times, maritime activities resulted in many ships running aground or sinking within the dangerous waters surrounding the Channel Islands, leaving us today with hundreds of historic shipwrecks, some discovered and many still lost. This rich maritime heritage of the Channel Islands region stands as a testament to the cultural importance and historic value of the Sanctuary.

In modern times, the unique nature of the Sanctuary region has attracted many commercial and recreational uses. The proximity of the northern Channel Islands and Santa Barbara Island to the mainland coast makes them uniquely accessible from Santa Barbara, Ventura, Port Hueneme, and Channel Islands Harbors as well as ports in Los Angeles County (primarily San Pedro and Terminal Island). Human use of the Sanctuary is not limited to regional residents; almost 20 percent of those who use California's coastal areas for recreation are interstate or international visitors ([California] Resources Agency of California 1997).

Within the Sanctuary region, population growth has risen sharply over the last twenty years. The population of southern California is nearly 20 million, including a combined population of over 1.1 million for the two counties adjacent to the Sanctuary, Santa Barbara and Ventura (U.S. Census Bureau 2000a). This represents a regional increase in population of approximately 43% since 1980 (U.S. Census Bureau 1995). As the numbers of people increase, so do the number of Sanctuary users involved in a wide variety of activities. Today the number of regional Sanctuary users is growing exponentially.

The purposes and policies of the National Marine Sanctuaries Act include to both "protect...the natural habitats, populations and ecological processes" (16 USC sec. 1431(b)(3)) of the Sanctuary and "facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of [the Sanctuary] not prohibited pursuant to other authorities" (16 USC sec. 1431(b)(6)). CINMS staff recognize the fact that each year thousands of people come to the Sanctuary to work and play, and the area's resources are an important part of individual livelihoods and recreation. Managed correctly, use and enjoyment of the Sanctuary can continue to thrive for generations to come.

This section briefly describes the Sanctuary's maritime heritage and summarizes a wide variety of commercial and recreational uses occurring within CINMS. Additional details about human activities within the Sanctuary can be found in the FEIS (Vol. II, Section 3.0).

Maritime Heritage

Maritime heritage resources (MHRs) consist of paleontological remains, prehistoric archaeological sites and associated artifacts, shipwrecks, aircraft wrecks, and material associated with wharves, piers and landings. These resources represent a broad time-span of the Santa Barbara Channel's cultural history. Early human remains of a woman ("Arlington Springs Woman") were discovered at Arlington Canyon on Santa Rosa Island, dating back to the end of the Pleistocene, approximately 13,000 years before present (B.P.). Historical remains may exist from as early as Juan Rodriguez Cabrillo's voyage of 1542 to 1543, through modern times.

Shipwrecks and Aircraft Wrecks

For hundreds of years, mariners transiting this region have been faced with prevailing winds, extreme weather conditions and natural hazards. Between the years 1853 to 1980, an inventory of over 140

shipwrecks and aircraft wrecks has been documented in the Sanctuary (Morris and Lima 1996). To date about twenty of these sites have been located. These wrecks reveal the diverse range of activities and nationalities that traversed the Santa Barbara Channel. They include vessels engaged in various trades; California Gold-Rush, passenger and cargo, lumber, international coal and grain, fisheries, military and island commerce. These American and European shipwrecks depict a remarkable diversity in sail and steam propulsion.

The Sanctuary has a very active shipwreck reconnaissance program working in partnership with the Channel Islands National Park and Coastal Maritime Archaeology Resources (CMAR) avocational group. Several of the submerged shipwreck sites have been recorded through the development of underwater maps.

Archaeological and Paleontological Artifacts

The coastal portion of the original Chumash homeland stretches along the California coast from north of Morro Bay to Malibu Point in the south, and encompasses the Northern Channel Islands. Occupying hundreds of villages within this area in sophisticated and complex societies, the ancestral Chumash people spoke several related languages throughout the region and relied on a diverse array of natural resources. The marine component alone of the diet consisted of marine mammals, over 150 types of

marine fishes (Miller 1988), and a variety of shellfish that included crabs, lobsters, mussels, abalone, clams, oysters, chitons, and other gastropods (Erlandson 1994). Shellfish were also important in other ways to the Chumash economy and material culture. For instance, Island Chumash produced the majority of shell bead money used by peoples throughout southern California (Miller 1988) and beyond. In fact, the modern designation of “Chumash” is derived from Mi’čumaš (or Mi’chumash), a Chumash word for “makers of shell bead money.”



Figure 15. *Chumash tomol, Santa Barbara Channel (CINMS)*

The abundance of prehistoric Chumash artifacts found in the Santa Barbara Channel attests to the thriving life ways of the Island Chumash before their

forced removal from the Islands due to European incursions. Study of those artifacts may help us understand the long-term viability of those lifeways by determining the relative effects of subsistence and environmental fluctuation on prehistoric faunal assemblages in the Santa Barbara Channel (Raab *et al.* 1995). In addition, this information has helped to piece together important Chumash trade networks and fishing practices, as well as the probable underwater locations of village sites, both near the mainland and within Sanctuary waters, that are now submerged by changes in sea level. During the period the “Arlington Springs Woman” lived, the sea level was at least 150 feet lower than it is today and the Northern Channel Islands were joined as one island (Johnson 2003). It is likely that some submerged artifacts were deliberately deposited in the water during religious ceremonies, were washed to the sea from shore, or have been deposited in the water through cliff erosion. As the descendants of those early people, today’s Chumash continue to have a deep spiritual and cultural connection to the Sanctuary, regularly journeying across the Santa Barbara Channel in tomols (seaworthy redwood plank canoes)

traditionally used for thousands of years for inter-village and inter-island trade and travel as well as for offshore fishing.

Recently discovered paleontological remains have also contributed to the rich record of the area. In 1994, for example, a relatively complete pygmy mammoth was discovered on a coastal bluff on the north shore of Santa Rosa Island. This discovery represents the most complete pygmy mammoth discovered in the world to date and suggests a high probability of the existence of submerged paleontological remains within the Sanctuary.

Current Human Activities

Chumash Cultural Activities

Today's Chumash continue to have a deep spiritual and cultural connection to the Sanctuary. Perhaps the most noteworthy Chumash cultural activity in the Sanctuary is the annual journey made by 200 or so Chumash people and their families, friends, and supporters to the island of Limuw, now known as the Channel Island of Santa Cruz. The people join together in an encampment at the traditional village site of *Swaxil* (a.k.a., Scorpion Campground), sharing together the cultural knowledge of their ancestors in story, song, and ceremony, as well as in the crafting and trading of traditional-style jewelry, musical instruments, baskets, cordage, and many other items. The focus of the event is the paddling of the tomol, 'Elye'wun, across the Santa Barbara Channel from the mainland—a rigorous journey of some 24 miles—and her arrival with her paddlers and support crews. They are welcomed with great ceremony and feasting. Not only does this event represent a deeply significant renewal of Chumash indigenous maritime culture, it also represents a successful collaboration of several years standing among Chumash Maritime Association, Barbareño Chumash Council, many Chumash individuals, CINMS, CINP, SBMM, and many volunteers.

Recreational Activities

Recreational and tourist-related activities occur throughout the waters of the Channel Islands National Marine Sanctuary. Many activities are more heavily concentrated close to the islands and on the eastern half of the CINMS. Sportfishing, diving, whale watching, pleasure boating, kayaking, surfing, and sightseeing are all popular pastimes within the Sanctuary.¹³ The recreation and tourism businesses represent over 490,000 person-days¹⁴ of annual activity within the CINMS annually¹⁵ (Leeworthy, Wiley and Stone 2005).

Sportfishing and Consumptive Diving

Due to its relatively mild weather, the Channel Islands region is a leading year-round sportfishing (or recreational fishing) area along the West Coast. In 1999, sportfishing and consumptive diving activity in the Sanctuary generated approximately \$24 million in income and supported 654 full and part-time jobs in Santa Barbara, Ventura and Los Angeles counties (Leeworthy and Wiley 2003). Recreational (or sport) fishing is typically done with hook-and-line, nets and spearguns and may be conducted from shore, from vessels, or using SCUBA equipment (consumptive diving). Both sportfishing and consumptive diving (including SCUBA and free-diving) in the Sanctuary take place primarily from private and chartered commercial passenger fishing vessels (CPFVs).

¹³ The National Park Service bans use of motorized personal watercraft within one nmi of the islands.

¹⁴ A person-day of activity is defined as one person participating in an activity for one day or any part thereof. For example, one person participating in an activity for three days would account for three person-days of activity.

¹⁵ For charter boat fishing, estimates were based on 2003 CDFG logbooks. For all other fishing activity, data is based on 1999 estimates.

Sport fisheries in the region access both nearshore and offshore areas, targeting bottom and mid-water fish species, primarily in the eastern half of the Sanctuary. Types of fish landed on CPFVs include kelp bass, mackerel, California sheephead, halibut, and whitefish. Species commonly targeted by consumptive divers, who travel from all over the world to dive in the Sanctuary, include many rockfish species and kelp bass, halibut, yellowtail and white seabass, as well as lobster and scallops. Offshore fishing focuses on mobile species like yellowtail, tuna, white seabass, barracuda, broadbill swordfish, marlin, and mako shark.



Figure 16. Recreational fishing, Anacapa Island (CINMS)

Wildlife Viewing

Wildlife viewing in the Sanctuary, especially whale watching, is very popular due to the high frequency of sightings and diversity of marine life. Day trips are offered from several area landings including Santa Barbara, Ventura and Channel Islands harbors. In 1999, eight whale watch operations accounted for almost 26 thousand person-days of activity and about \$1.5 million in revenue from CINMS activity (Leeworthy and Wiley 2003).

A national survey on recreation and the environment conducted in 1999 estimated more than 31.3 million people participated in some form of coastal and marine wildlife viewing or nature-based recreation in the U.S. (NOAA 2003a), while over 6.3 million participated in California (Leeworthy 2001). California ranked second only to Florida in terms of the overall number of participants engaged in marine recreation (over 22 million participants in Florida versus about 18 million in California). Most of the activities captured in this survey either directly or indirectly (visiting beaches, diving/snorkeling, kayaking/canoeing, photographing scenery) involved watching wildlife.

Boating, Sailing, Kayaking, and Surfing

Boating is another popular recreational activity within the Sanctuary, which, due to its numerous protected anchorages and scenic coastlines, is a highly sought-after destination for both sail and powered boats. The Channel Islands are within reach of several ports for single or multiple day trips and Channel Islands, Ventura, and Santa Barbara Harbors contain over 5,000 slips used by recreational, commercial, and research vessels. Numerous vessels also traverse the region while in transit to other ports.

Due to abundant marine life and the presence of large sea caves and rock formations, the Channel Islands are considered a primary destination of interest for sea kayakers in California. Several regional operations offer sea kayaking excursions in the Sanctuary region. Users can also take kayaks out to the islands on commercial or private vessels, and spend single or multiple days kayaking along the islands' shorelines.

In 1999, eight for-hire operators provided over 4000 person-days of sailing in the Sanctuary, and four businesses provided over 1200 person-days of kayaking/and sightseeing in the Sanctuary. These operators received about \$390 thousand in revenue from this activity, which in turn generated over \$797

thousand in income and supported 24 full and part-time jobs in Ventura and Los Angeles counties (Leeworthy and Wiley 2003).

Although there are several surfing areas located around the Channel Islands, they are not well documented. Surfing occurs year-round within the Sanctuary, but is generally most popular during the summer months. The number of surfers visiting the Sanctuary has risen steadily over the past several years, with the most popular destinations being closer to mainland ports.



Figure 17. Scuba diving is a popular activity in the Sanctuary. (CINMS)

Non-Consumptive Diving

The Sanctuary region is considered to have some of the most highly sought after diving locations in the world. There is great interest in non-consumptive diving in the Sanctuary due to the diversity and beauty of the marine habitat, shipwrecks, and other underwater historical sites. Of the over 140 wrecks in the Channel Islands National Park and National Marine Sanctuary, 21 of these have been located and are popular dive sites. In 1999, seven charters operators accounted for almost 11 thousand person-days of nonconsumptive diving in the Sanctuary and earned approximately \$685 thousand in revenue (Leeworthy and Wiley 2003).

Commercial Activities

Fishing

The Sanctuary has extremely productive commercial fishing grounds. Commercial fishing gear used in the Sanctuary includes nets, traps, lines, and dive equipment. The majority of target species are caught in nearshore waters containing giant kelp beds, an important habitat for numerous species. Key target species include: squid, sea urchin, spiny lobster, prawn,¹⁶ nearshore and offshore finfishes (*e.g.*, rockfishes and California sheephead), coastal pelagic species (*e.g.*, anchovy, sardine, and mackerel), flatfishes (*e.g.*, California halibut, starry flounder, and sanddabs), rock crab, sea cucumber, tuna, and kelp. Live fish trapping for rockfish, California sheephead, California scorpionfish and other shallow water species occurs primarily near the coastlines of the Channel Islands. In addition, trap gear is used to take shrimp and prawns, California spiny lobster, and three types of rock crab (red, brown and yellow). Other fisheries include shark and swordfish drift netting, squid seining, urchin diving, ocean (or pink) shrimp trawling, and diving or trawling for sea cucumbers. Most of California's commercial dive sea cucumber catch is from the four northern Channel Islands (Leet *et al.* 2001). Abalone, once one of the most valuable fisheries in the Sanctuary (over \$2.5 million harvested between 1988 and 1997 according to Leeworthy and Wiley 2003) and state, was closed to commercial harvest by the state legislature in 1997. There is a small but increasing fishery for turban snails and whelks, which is not currently regulated.

Of the Sanctuary's commercially caught species market squid, sea urchin, and spiny lobster are some of the most economically valuable, with squid and urchin exceeding the market value of all other species.

¹⁶ Prawn fisheries in the Sanctuary area have historically included trawl and trap fishing for spot prawns and trawl fishing for ridgeback prawns. In 2003 the California Fish and Game Commission adopted a prohibition on spot prawn trawl gear.

Table 1 shows the average ex vessel value of marine species, by group, caught in CINMS and landed commercially between 1996 and 2003.

Table 1. Average Ex Vessel Value of CINMS Commercial Catch (1996 – 2003)

Species Group	Value	Species Group	Value
Squid	\$10,788,355	Shark	\$34,397
Kelp	\$5,991,367	Abalone ³	\$0
Sea Urchins	\$4,320,544	Swordfish	\$50,087
Spiny Lobster	\$1,024,536	Roundfish	\$32,736
Prawn ¹	\$210,978	Others	\$22,493
Rockfish ¹	\$152,892	Yellowtail	\$8,066
Crab	\$414,732	Shrimp	\$3,505
Tuna ¹	\$3,085	Mussels & Snails	\$5,819
Wetfish	\$474,251	Salmon	\$5,119
CA Sheephead ²	\$155,290	Rays & Skates	\$993
Flatfishes	\$218,328	Surf Perch	\$412
Sea Cucumbers	\$222,007	Grenadiers	\$106
Sculpin & Bass	\$93,203	Octopus	\$105
All Species/Species Groups = \$24,233,406			

1. Prawn, Rockfish and Tuna values are 2003 values due to steep declining trends prior to 2003 (2003 value was deemed most appropriate for use by NOAA economists – see source for more information).

2. CA Sheephead value is the 2000-2003 average (deemed most appropriate years for averaging by NOAA economists due to a leveling out of trends during this period – see source for more information).

3. Abalone value from 1996 is excluded from averaging since all commercial abalone harvest has been prohibited since 1997.

Source: Leeworthy *et al.* (2005)

Kelp Harvesting

For over 50 years, giant kelp harvesting occurred near Point Conception, San Miguel Island, Santa Rosa Island and near Point Mugu and was, prior to 2005, another of the Sanctuary's most valuable harvested species. In 1999, kelp harvested from the CINMS had a processed value of about \$6 million (Leeworthy and Wiley 2003). Commercial kelp harvesting ended in 2005 for economic reasons. The total demand for kelp products, which were produced in San Diego, declined (Glantz of ISP Alginates personal communications). Before 2005 and the closure of the San Diego operation, the surface canopy of kelp forests was harvested several times annually in state waters (Kimura and Foster 1984; CDFG 2002).

Oil and Gas

The Santa Barbara Channel is rich in oil and gas resources. As a result numerous oil and gas activities have occurred in this region for over a century and oil has been extracted from the Santa Barbara Channel region since 1896 (Lima 1994). In 1969, a blowout at the Unocal platform off the California coast near the town of Summerland caused a significant oil spill along the south central California coast. The impacts resulting from this accident were one of the major factors contributing to the designation of the CINMS in 1980. Since designation all new oil and gas exploration, development, and production activities have been prohibited in the Sanctuary.

Currently, there are 79 remaining federal outer continental shelf (OCS) active leases off the coast of Southern California (MMS 2008). Of these 79 federal leases there are a total of 43 developed (producing) leases (MMS 2008), 39 of which are in the Channel Islands region. Three lease units pre-date CINMS

designation and slightly overlap the Sanctuary at its eastern boundary; the rest are outside of the Sanctuary. The status of the oil fields containing the active leases is provided in FEIS section 3.5.1.

Shipping

CINMS is located in close proximity to Los Angeles/Long Beach Harbor, the second busiest port in the United States,¹⁷ and Port Hueneme, a deep-water international port. These ports generate extensive commercial shipping traffic transiting the Santa Barbara Channel using shipping lanes passing through the Sanctuary at its northeast boundary (an average of 6,500 cargo vessels travel through the Santa Barbara Channel each year).¹⁸ CINMS is one of only two internationally accepted “areas to be avoided” (ATBAs) for oil tankers on the Eastern Pacific. As a result, oil tankers often voluntarily reroute to the outer Santa Barbara Channel, outside the Sanctuary.



Figure 18. Platform Gail, Santa Barbara Channel (Laura Francis)

Department of Defense/Homeland Security Activities

Currently, CINMS maintains a positive and important working relationship with the regional representatives of United States military, which maintains a strong presence in the CINMS region. The U.S. Air Force and U.S. Navy, individually and together, conduct training exercises, and support military testing and evaluation projects for aircraft, ship, and missile programs. Both support commercial space launch missions as well. The Vandenberg Air Force Base (VAFB), Point Mugu Sea Range and Port Hueneme coastal and marine areas are the primary locations for these military activities.

VAFB, located in western Santa Barbara County, is headquarters for the U.S. Air Force’s 30th Space Wing. The Air Force’s primary missions at VAFB are to launch and track satellites in space, test and evaluate America’s intercontinental ballistic missile systems and provide aircraft operations in the Western Range. VAFB also supports commercial space launch ventures and supports aircraft and helicopter training and testing

In addition to mainland facilities, Point Mugu encompasses a 36,000 square mile Sea Range that supports five categories of tests to evaluate sea, land and air weapons systems: 1) air-to-air testing; 2) air-to-surface testing; 3) surface-to-air testing; 4) surface-to-surface testing; and 5) subsurface-to-surface testing. In addition, the Sea Range supports fleet training exercises, small-scale amphibious warfare training and special warfare training.

¹⁷ Information about L.A/Long Beach Harbor is available at: http://www.polb.com/html/1_about/overview.html.

¹⁸ A Traffic Separation Scheme (TSS) manages vessel traffic in the Santa Barbara Channel. Voluntary routes that separate opposing flows of traffic with an empty safety lane, TSSs are typically in international waters and must be approved by the International Maritime Organization (IMO). In addition, CINMS is one of only two internationally accepted “areas to be avoided” (ATBAs) for oil tankers on the eastern Pacific. ATBAs are areas within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which should be avoided by all ships or certain classes of ships. As a result, oil tankers voluntarily reroute to the outer Santa Barbara Channel.

The U.S. Coast Guard (USCG), which operates a Marine Safety Detachment and Coastal Patrol Boat at Santa Barbara, California and a Station and Coastal Patrol Boat at Oxnard, California conducts several activities in the Sanctuary region, such as search-and-rescue, migrant and drug interdiction, fisheries enforcement, marine environmental protection, marine mammal protection and monitoring and inspection of all international vessels experiencing mechanical difficulty and distress.¹⁹

Research Activities

The Channel Islands are the subject of extensive scientific interest as thousands of academic and professional researchers conduct research activities within CINMS and are producing a myriad of Sanctuary-focused articles, academic papers, and other products.

The Channel Islands are the subject of extensive research activities, most of which fall under the following categories: physical and biological science research; socioeconomic, cultural, and historic research; and political science research. Within each of these categories research projects are typically:

1. *Intramural* (projects are funded by the NMSP and conducted by CINMS staff);
2. *Extramural* (projects are funded and conducted by outside agencies and institutions); or
3. *Directed* (projects are conducted by outside agencies and institutions with guidance and/or support from CINMS and the NMSP).

Physical and Biological Science Research

Research activities pertaining to the Sanctuary's physical and biological setting are the most extensive. In their report *Summary of Research Programs in the Channel Islands National Marine Sanctuary*, Abeles *et al.* (2003) provide a comprehensive assessment of major physical and biological science research activities in the Sanctuary to date, with a focus on studies including a long-term monitoring component. As shown in Table 2 below, the report categorizes 43 research projects in the Sanctuary according to ecological levels of classification: population studies (marine plants, marine invertebrates, marine fish, marine birds, marine mammals), community studies, environment studies, and ecosystem studies.

Table 2. Summary of Major Biological and Physical Science Research Activities in CINMS (adapted from Abeles *et al.* (2003) and updated with information provided by MMS)

Study	Agency, Institution Or Researcher	Data Collection Period
Category 1: Population Studies		
Marine Plants		
Aerial kelp canopy monitoring	CINMS	1999 -
Eelgrass Surveys	UCSB	1992 -
Marine Invertebrates		
Anacapa urchin reef surveys	UCSB	1981 -
White abalone studies	CDFG	mid-1980's -
ROV market squid surveys	CDFG	1999 -
Aerial market squid surveys	CDFG	1992 - 2000
Marine Fish		
Acoustic telemetry monitoring	PIER	2000 - 2006
Giant sea bass monitoring	Kathy de Wet-Oleson	1997 -

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¹⁹ Although the U.S. Coast Guard is not technically considered part of the military, nor does it fall under the authority of the Department of Defense but rather the Department of Homeland Security, due to the similar nature of some of their activities, they are described here.

Table 2. Summary of Major Biological and Physical Science Research Activities in CINMS (adapted from Abeles et al. (2003) and updated with information provided by MMS)

Study	Agency, Institution Or Researcher	Data Collection Period
Nearshore SCUBA surveys	UCSB	1995 -
Midwater trawl surveys	UCSB	1995-2000
Deepwater submersible surveys	UCSB	1995 -
Marine Birds		
Cormorant monitoring	Humboldt State University	1991-2003
Xantus's Murrelet 1	Humboldt State University	2000 -
Xantus's Murrelet 2	Humboldt State University	2001 -
Pelican and Cormorant studies	CA Inst. of Env. Studies & UC Davis	1970 - 1995
Cassin's Auklet studies	USGS	1999-2001
Ashy Storm-Petrel studies	USFWS, USGS, Humboldt State University Foundation	1995-1998; 1999-2002.
Seabird population dynamics	CINP	1985 -
Marine Mammals		
Pinniped populations studies	National Marine Mammal Laboratory	1968 -
Aerial pinniped monitoring	NOAA Fisheries	1981 & 1987
Sea lion diet studies	NOAA Fisheries	1981 -
Harbor seal annual census	CDFG	1982 -
Humpback and blue whales	Cascadia Research	1986 -
CI Naturalist Corps marine mammal observations	CINMS	2000
Category 2: Community Studies		
Sand beach and coastal lagoon	CINP	1994 -
Rocky intertidal monitoring	CINP	1982 -
Kelp forest monitoring	CINP	1982 -
Subtidal @ San Miguel Island	California Abalone Association	2001-2002
REEF monitoring	REEF	1997 -
Biogeography of nearshore fishes	Vantuna Research Group, Occidental College	2000
PISCO	UCSB, UCSC, Stanford, OSU	1999 -
Wind to whales	UCSC	1995; 1997; 2000
Collaborative marine research	CINMS, CDFG, NOAA Fisheries, Sea Grant, UCSB, PISCO, Santa Barbara and Ventura fishermen	2001 -
SAMSAP	CINMS	1997 -
Category 3: Environment Studies		
CODAR	UCSB	1997 -
Remote sensing	CINMS	1997 -
Side scan sonar mapping	USGS	1998 -
Over 30 publications on oceanography research in the Santa Barbara Channel*	Scripps Institution of Oceanography, Minerals Management Service	1991 -
Category 4: Ecosystem Studies		
So. Cal. Bight Regional Marine Monitoring	CINMS, SCCWRP, LA County Sanitation District	1998; 2003
Plumes and Blooms	Institute for Computation Earth System Sciences	1996 -

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Table 2. Summary of Major Biological and Physical Science Research Activities in CINMS (adapted from Abeles et al. (2003) and updated with information provided by MMS)

Study	Agency, Institution Or Researcher	Data Collection Period
Long-Term Ecological Research (LTER) Program	UCSB	(not provided)
California Cooperative Oceanic Fisheries Investigations (CalCOFI)	CDFG, NOAA, NOAA Fisheries, UC Scripps Institute of Oceanography	1951 -
Marine Ecological Reserves Research Program (MERRP)	CDFG, Sea Grant, NOAA Fisheries	1997 -

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*See <http://www.gomr.mms.gov/homepg/espis/espisfront.asp> to find more information on these publications.

Socioeconomic, Cultural, and Historic Research

Research activities pertaining to the Sanctuary's human setting include socioeconomic studies of industries and individuals linked to the Sanctuary, as well as studies of maritime heritage resources. Socioeconomic studies in the Sanctuary have not been as extensive as other research projects in the Sanctuary. However, since the California Department of Fish and Game and CINMS began the Channel Islands marine protected area (MPA) network process, several socioeconomic studies have been undertaken and a major socioeconomic monitoring program is being developed and implemented. Maritime heritage resource research is focused on either studies of Chumash artifacts, paleontological remains, or studies of historic shipwrecks, aircraft wrecks, and material associated with wharves, piers and landings. The NMSP and major partners, such as the CINP, the Santa Barbara Maritime Museum, the State of California, and the Coastal Maritime Archaeology Resources (CMAR) conduct the majority of research on Sanctuary maritime heritage resources.

Political Science Research

Political science research focuses on the Sanctuary's operational setting. Several political scientists studying topics such as collaborative stakeholder-based processes, or consensus-based processes, have cited CINMS as a case study. Political science interest in the Sanctuary primarily stems from the Sanctuary's use of the Sanctuary Advisory Council and its working groups. Political science research projects tend to be extramural.

Educational Activities

Educational activities have been a central focus of the Sanctuary since its 1980 designation. Today the Sanctuary plays an important role in public and formal marine science education activities for all ages from K-12, to adults. Sanctuary educational activities have reached a wide variety of audiences on a local, regional, national, and international scale. CINMS educational activities are focused in two strategic areas: 1) community involvement, partnerships, and community program development, and 2) product development.

Community Involvement, Partnerships and Community Programs

Community involvement is an essential component of the CINMS Education and Outreach program. Community involvement in Sanctuary educational activities is achieved in large part through the Channel Islands Naturalist Corps: a volunteer corps of naturalists trained to provide interpretation about the Sanctuary and Park on a variety of passenger vessels, such as whale watch and dive boats, as well as at outreach and special events. Community involvement in educational activities is also achieved through the Sanctuary Advisory Council and in particular its Sanctuary Education Team. This team is made up of community members who work to address Sanctuary education needs, and to keep local educational institutions informed about Sanctuary educational opportunities. Advisory Council members at large are

charged with keeping their constituents educated about the Sanctuary. Community involvement in educational activities is also achieved through participation in Sanctuary events and programs.

Together the Sanctuary and its education partners develop and implement numerous interactive educational programs including training programs, workshops, special events, and school programs. CINMS Education staff present workshops and programs at a variety of regional and national conferences each year such as the Southwest Marine Educators Association, California Science Teachers Association and National Marine Educators Association.

Training programs and teacher workshops teach educators about marine science using the Sanctuary as subject matter, and many are linked to Sanctuary products such as curriculum packages and CD-ROMs. Other workshops target a broader segment of the community, such as the Marine Wildlife Viewing Workshop, which is open to all members of the public interested in responsible wildlife viewing practices. Each year the Sanctuary sponsors a variety of public educational cruises targeting varying audiences including local residents, tourists, school children and community groups. These cruises provide field experiences in the Sanctuary and may include activities such as: intertidal and sandy beach monitoring, floating labs, students on research vessels posing questions to divers below using live video and audio feed, kayaking, diving, and wildlife viewing. Sanctuary staff and volunteers facilitate hands-on activities such as oceanography experiments, fish identification, marine mammal and seabird identification, fish surveys, and wildlife viewing to encourage an understanding and stewardship for Sanctuary resources. The Sanctuary and its partners also support marine science programs in local schools such as MERITO and the Channel Islands Argonauts.

Beyond these formal educational programs sponsored by CINMS and its partners, educational activities are also provided at community programs such as whale festivals, harbor festivals, boat shows, and dive industry events. This management plan outlines many additional community-based programs the Sanctuary plans to implement such as multicultural-targeted marine science after-school programs, and volunteer boater interpretive enforcement through the Team OCEAN and Marine Watch programs.

Educational Products

The second strategic area of Sanctuary educational activities is composed of Sanctuary educational products including: printed materials, the Sanctuary website, audio-visual materials, signs, displays, and exhibits. Some of these educational products, such as curriculum packs, are available as materials tied to Sanctuary courses, trainings, and workshops. Other products, such as signs, brochures, websites, and displays, are targeted at the general public. The Sanctuary's general educational products are available at the Sanctuary's offices as well as at local businesses, ports and harbors, museums, local visitor's centers, and online. As in the case of educational programs, the Sanctuary's education partners have played a major role in both designing and disseminating educational products about CINMS.



Figure 19. MERITO Academy students remove non-native ice plant from Anacapa Island. (Rocío Lozano)

PART II-D: THE OPERATIONAL SETTING

The Channel Islands National Marine Sanctuary (CINMS or Sanctuary) operational setting includes CINMS and National Marine Sanctuary Program (NMSP) administration and management, along with the administration and management of numerous other federal, state, and local agencies with whom the Sanctuary shares jurisdiction over particular resources or activities. This description of the operational setting focuses on the Sanctuary's human resources, infrastructure, Sanctuary Advisory Council, funding, enforcement, and permitting. In addition, it provides brief descriptions of the various federal (internal and external to NOAA), state, and local agencies with jurisdiction relevant to the Sanctuary. The tools the Sanctuary uses to formalize relationships with these agencies are also described.

Human Resources

The Sanctuary Superintendent

While reporting directly to the NMSP West Coast Regional Director, the CINMS superintendent oversees site-specific management functions, including implementation of the management plan. The Sanctuary superintendent also delegates responsibility for implementing specific programs and functions to staff, provides an administrative framework to ensure all resource management activities are coordinated, and provides and manages the budget and infrastructure necessary to support site operations. Responsibilities of the CINMS superintendent include:

- Recommending priorities to the NMSP for annual allocation of funds for site-specific education, outreach, research, monitoring and resource protection needs, such as surveillance and enforcement activities, violations and emergencies;
- Coordinating with the NMSP in the evaluation, processing and issuing of permits;
- Monitoring and evaluating research, education, marine resource management and cultural resource management programs;
- Overseeing staffing needs and requirements;
- Coordinating on-site efforts of all parties involved in Sanctuary activities including state, federal, tribal, regional and local agencies;
- Working closely with constituents and the community; and
- Evaluating overall progress toward the achievement of CINMS goals and objectives.

Sanctuary Staff

Basic staffing resources provide support for the site's seven functional areas:

1. Community and Management Planning;
2. Technology Integration and Management;
3. Site Operations;
4. Resource Protection;
5. Research and Monitoring;
6. Education and Outreach;
7. Maritime Heritage; and
8. Office Administration.

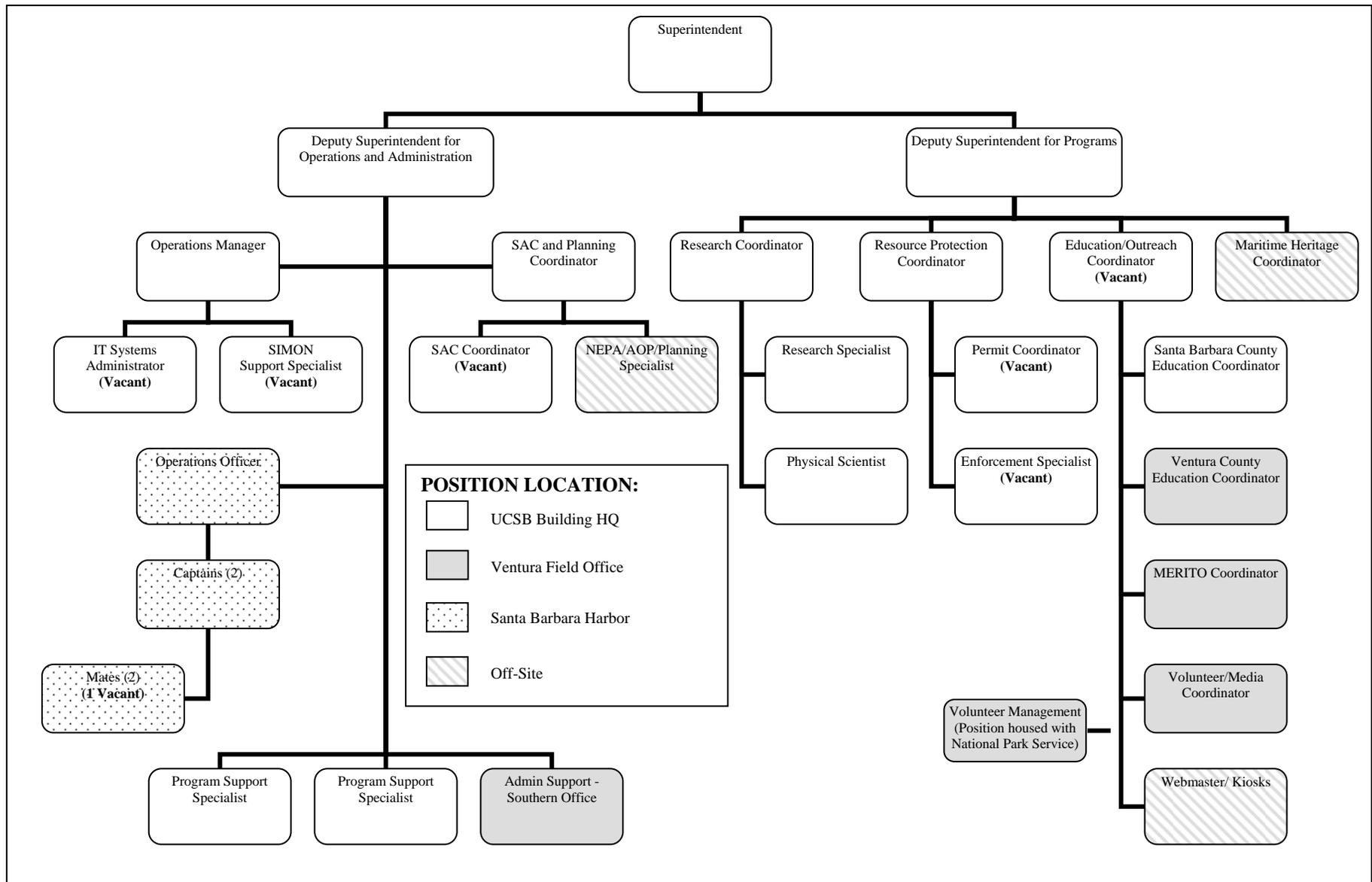


Figure 20. CINMS Organizational Chart

Sanctuary staff have knowledge and expertise in policy, marine resource management, education and outreach, volunteer development, research and monitoring, maritime heritage resources, GIS and communications technology as well as office administration. In addition, volunteers and interns are an integral component of Sanctuary staffing. Figure 20 (above) provides a Sanctuary staff organization chart, including new (vacant) positions that management would like to fill as resources allow.

R/V Shearwater

The Sanctuary's state of the art 62' high-speed Teknicraft catamaran R/V *Shearwater* is used primarily as a research platform and provides a major contribution to regional research efforts. In addition, the vessel serves as a host for educational field trips and emergency response in and around the Channel Islands National Marine Sanctuary.

The *Shearwater* arrived in Santa Barbara Harbor on March 25th 2003 and has been in operation approximately 80% of the available days. CINMS staff provide all crew and maintenance for the *Shearwater*, which is outfitted with some of the latest research equipments, such as:

- An A-frame and winch for trawls, CTD casts, sediment sampling, and towing equipment such as sidescan sonar and ROVs.
- Wet and dry labs allow on-board processing of samples and data.
- Onboard facilities and equipment for supporting dive operations.
- On board berthing, stowage, galley and safety equipment allow for multiple-day excursions with crews of up to ten scientists.



R/V *Shearwater* (All American Marine)

Sanctuary Infrastructure

Offices

The main CINMS office is located at the Santa Barbara Harbor, while a southern satellite office is located at the Channel Islands Harbor in Oxnard. In the future, other satellite offices and visitor centers may be located throughout the region as deemed necessary to accommodate the need for additional office space and to improve community outreach efforts. These additional facilities may be developed through various partnerships with both the public and private sector (See Strategy OP.3 of the Operations Action Plan).

Vessels and Aircraft

The Sanctuary currently operates two vessels and works with NOAA and other aircraft in support of research, monitoring, education and emergency response.

The R/V *Shearwater* is the Sanctuary's 62-foot Teknicraft catamaran. This vessel serves as an important multi-day platform, supporting the bulk of CINMS' research, monitoring and education programs, including oceanographic and biological studies. It is equipped with state-of-the-art bridge electronics and oceanographic equipment.

The Sanctuary also maintains a smaller "quick response" vessel. Through 2007, the Sanctuary used a 28-foot Wilson craft called *Xantu* for this purpose. In 2008 the Sanctuary replaced the old *Xantu* with a new vessel. The new vessel is 41-feet in length and features: an advanced composite/fiberglass catamaran hull design; a 15-foot beam; twin turbo diesel engines with biodiesel fuel running capability; room for ten, day-trip passengers; a six-diver capacity; a 300 mile range; and a top speed of 28 knots. Maintaining a small

craft has proven invaluable in a number of Sanctuary resource protection incidents such as minor oil spills and vessel groundings. Small craft also provide a research and dive platform, supporting single day trips.

Up until 2007, the Sanctuary maintained its own single-engine amphibious aircraft. As of 2008, the Sanctuary is working with a new aircraft serving numerous NOAA missions on the west coast. The Sanctuary utilizes aircraft primarily for aerial monitoring for vessel traffic, marine mammals and kelp canopy coverage, while conducting general Sanctuary surveillance. When conducting aerial surveys aircraft carry observers and equipment such as GPS/Loran, radar altimeter, hardpoints for camera pods, and a laptop computer with data collection software.

The Sanctuary Advisory Council

The Sanctuary Advisory Council (Advisory Council) includes representatives from 10 government agencies and 11 community stakeholder groups. With its expertise and diverse representation, the Advisory Council provides advice and recommendations to the Sanctuary Superintendent on resource management issues and helps ensure the superintendent has a wide range of viewpoints upon which to base management decisions.

In order to better understand and address specific management issues, the Advisory Council extends its capacities by forming a variety of working groups and subcommittees. Working groups invite additional community members and experts to participate in the development of sound management advice for the Sanctuary. Subcommittees, which remain internal to the Advisory Council, take on specific short-term tasks to assist with a variety of Council needs. For a list of current Advisory Council members see <http://channelislands.noaa.gov/sac/main.html>.

Relationships With Other NOAA Offices

Of the many NOAA offices, there are several working closely with CINMS and other national marine sanctuaries in a wide variety of capacities, including:

NOAA Fisheries (National Marine Fisheries Service or NMFS)

NOAA Fisheries administers NOAA programs that assess, manage and promote the domestic and international conservation of living marine resources within the United States jurisdiction. NOAA Fisheries' Southwest Region Office (Long Beach, CA) and associated Southwest Fisheries Science Center (La Jolla, CA) serve the Southwestern United States and Pacific Ocean Islands, including the Channel Islands. More specifically, in conjunction with state resource agencies (such as the California Department of Fish and Game) NOAA Fisheries approves and enforces Fishery Management Plans (FMPs) prepared by regional fishery management councils under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). NOAA Fisheries also shares responsibility with the U.S. Fish and Wildlife Service for the implementation of the Marine Mammal Protection Act and the Endangered Species Act, both of which prevent the taking of any endangered, threatened, or otherwise depleted species. As part of the Marine Mammal Protection Act mandate, NOAA Fisheries Office of Protected Resources (OPR) works in collaboration with the Protected Resources Divisions of the NOAA Fisheries Regional Offices and Science Centers to develop and implement a variety of programs for the protection, conservation, and recovery of marine mammals.

NMFS OPR is also responsible for implementing the ESA, generally managing endangered and threatened marine species, including anadromous salmonids. NMFS and USFWS share joint responsibility for managing sea turtles. In the Pacific Ocean, NMFS manages 5 species of sea turtles, over 25 evolutionarily significant units of salmon and steelhead, including their critical habitat, white abalone, 7 large whales and several species of pinnipeds. In coordination with the regional offices and

science centers, OPR develops policies and regulations to implement the provisions of the ESA with the goal of protecting and recovering endangered and threatened marine and anadromous species and their habitat.

NOAA Fisheries offers resources to the Sanctuary such as collaborative assistance on environmental policy processes and enforcement through NOAA's Office for Law Enforcement (OLE). They also provide technical expertise on many issues related to resource protection and management. NOAA Fisheries has one member and one alternate seat on the Advisory Council.



Figure 21. NOAA Ship McArthur

NOAA Corps

CINMS has traditionally filled Sanctuary positions with officers from the NOAA Corps, which is administered by NOAA Marine and Aviations Operations. These highly skilled officers are trained in engineering, earth sciences, oceanography, meteorology, fisheries science, and other related disciplines.

Throughout NOAA they operate ships, fly aircraft, manage research projects, conduct diving operations, and serve in staff positions. Salaries for officers on billets at national marine sanctuaries are subsidized by the NOAA Corps.

The Office of Response and Restoration (OR&R)

OR&R works to prevent and mitigate harm to coastal resources and is the primary NOAA office responding to oil spills and hazardous material releases. It provides scientific support to the U.S. Coast Guard for spills and technical assistance to other agencies for hazardous material releases. OR&R also works with federal, state, and tribal natural resource trustees to restore damaged coastal resources.

Sea Grant

The National Sea Grant College Program encourages the wise stewardship of marine resources through research, education, outreach, and technology transfer. Sea Grant is a partnership between the nation's universities and NOAA that began in 1966, when the U.S. Congress passed the National Sea Grant College Program Act. Today, the Sea Grant Colleges are focused on marine research and the sustainable development of marine resources. Sea Grant produces and makes available a wealth of information on marine topics - from public school curriculum materials to the most advanced scientific research. Sea Grant fellows work throughout NOAA for a wide variety of offices, including the NMSP.

Damage Assessment Center (DAC)

DAC implements NOAA's responsibilities for natural resource damages assessment for releases of oil and hazardous substances. DAC scientists and economists provide the technical foundation for these assessments and work with other trustees and responsible parties to restore resources injured by releases of oil and hazardous substances, as well as other injury to resources of national marine sanctuaries and estuarine research reserves. DAC collects data, conducts studies, and performs analyses needed to determine whether coastal resources have sustained injury from releases of oil or hazardous materials, how to restore injured resources, and to ascertain the damages that must be recovered to accomplish restoration.

DAC maintains an administrative record to facilitate public input, conducts public outreach activities, documents expenditures to support cost recovery, and administers and oversees significant damage assessment contracting capabilities. DAC works with other NOAA elements and federal and state agencies at both the national and regional levels and supports a network of field offices. DAC provides technical support to NOAA's Office of General Counsel and the Department of Justice for litigation and for settlement of natural resource damage claims.

Office of Coastal Resource Management (OCRM)

OCRM is responsible for implementing the Coastal Zone Management Act of 1972 (CZMA), which Congress passed to address the growing concerns about the health of the nation's coastal resources. The office works with state and territorial governments to implement their coastal management programs and find local solutions to problems occurring throughout the entire nation. Daily management decisions are made at the state and territorial level. Thirty-four states and territories have active coastal management programs.

OCRM works to advance national coastal management initiatives, and to maintain and strengthen state coastal management through financial, policy and technical assistance. It also helps to ensure actions of federal agencies are consistent with state and territory coastal management policies. It undertakes projects with program-wide or system-wide benefits in the areas of coastal habitat protection and restoration; coastal hazards; public access to the shore for recreation; responsible development of coastal communities, including urban waterfronts; and polluted runoff (also known as non-point source pollution or runoff pollution).

The National Estuarine Research Reserve System (NERRS)

NERRS is a network of 25 estuarine areas — places where fresh water from land drainage mixes with saltwater from the sea — established across the nation for long-term stewardship, research, and education purposes. Estuaries can be bays, lagoons or sloughs and are crucial spawning areas for many commercial fish and shellfish. Estuaries also serve to buffer upland areas from flooding. The sites within the estuarine reserve system range in size from 365,000-acre Kachemak Bay, Alaska, to 571-acre Old Woman Creek, in Erie County, Ohio.

The National Ocean Service (NOS) implements NERRS as part of the Coastal Zone Management Act (CZMA) of 1972, which called for the establishment of a network of estuaries representing different biogeographical regions of the United States. Within this network, reserve scientists and other researchers conduct ecological research and their findings are communicated to coastal managers.

Special Projects Office (SPO)

SPO is the focal point for providing NOS and NOAA Program and Staff Offices with planning, data synthesis and assessment, and advanced technical services (*e.g.*, GIS and web mapping, database development, and information visualization tools). SPO's primary goal is to promote integration of program capabilities within and across NOS and NOAA to ensure more effective and efficient delivery of products and services to the coastal stewardship community.

SPO works to build capacity within NOAA and NOS by collaborating with internal partners to define problems and issues, identify information needs, assemble and synthesize relevant data, develop strategies, evaluate options, and develop products and results contributing to and supporting better coastal resource management decision-making. SPO also provides NOS with a quick response capability to anticipate and respond to emerging opportunities to further the coastal stewardship mission.

The National Centers for Coastal Ocean Science (NCCOS)

NCCOS conducts and supports research, monitoring, assessment, and technical assistance for managing coastal ecosystems and society's use of them. These activities fit within a framework of five environmental stressors: climate change, extreme natural events, pollution, introduced species, and land and resource use. NCCOS activities are focused in estuaries, coral reefs, national marine sanctuaries, and national estuarine research reserves, as well as other coastal ecosystems. NCCOS is the primary NOAA office that conducted the CINMS biogeographic assessment for the CINMS boundary evaluation process (see the Boundary Evaluation Action Plan).

MPA Center

The Marine Protected Area (MPA) Center works to implement Executive Order 13158, which directs federal agencies to conserve the nation's valuable marine resources through a variety of tasks related to marine protected areas. This implementation requires considerable cooperation, collaboration, and information sharing among many government and private institutions. Working with the Department of the Interior (DOI) and other partners, the MPA Center: develops the framework for a national network of MPAs; coordinates the development of information, tools, and strategies, and guides agencies in their efforts to enhance and expand the protection of existing MPAs, and to establish or recommend new ones; coordinate the MPA web site; partners with federal and non-federal organizations to conduct research, analysis, and exploration; helps construct and maintain an inventory of existing U.S. marine managed areas and the MPA List; and supports selection of the MPA Advisory Committee and its operation.

Relationships With Other Regional Authorities

CINMS seeks to provide comprehensive and coordinated Sanctuary management in a way that complements existing regulatory authorities and capitalizes on opportunities to establish close working relationships. Within the coastal and offshore waters adjacent to southern California, the Sanctuary operates alongside and in some cases, in direct partnership with local, state, and federal jurisdictions. Several of these partnerships are identified within the specific management strategies proposed in the action plans.

Coastal and offshore waters in the Sanctuary region are divided into several different categories, each of which has varying jurisdictions:

- State tidelands and submerged lands (mean high tide line to three nmi²⁰ offshore);
- The outer continental shelf (OCS) (seaward of three nmi from shore, with exceptions in Texas and Florida);
- The territorial sea (shoreline to 12 nmi offshore);
- The contiguous zone (12 to 24 nmi offshore);
- The exclusive economic zone (EEZ) (12 to 200 nmi offshore); and,
- The high seas (beyond 200 nmi from shore).

²⁰ One nautical mile (nmi) is equivalent to 1.852 kilometers or 1.15 statute miles.



Figure 22. Various jurisdictions in the CINMS region

Several laws and court rulings have clarified the complex jurisdictional setting of the Channel Islands region. The Federal Submerged Lands Act of 1953 granted ownership of lands and natural resources from the mean high tide line to three nautical miles (nmi) offshore to coastal states. This provided for state control and regulation of the development of resources such as oil and gas and fisheries within three nmi. In addition, the Outer Continental Shelf Lands Act of 1953 established federal jurisdiction over the resources beyond three nmi and created a legal framework within which to manage those resources.

Although the Channel Islands are located more than three nmi from the mainland coast, *United States v. California* (1965)²¹ established state jurisdiction to three nmi offshore from each of the Islands. Federal jurisdiction extends beyond three nmi offshore from the mainland and islands. A detailed description of jurisdictions and the various agencies with regulatory authority is provided in California's Ocean Resources: An Agenda for the Future ([California] Resources Agency of California 1997), and in the FEIS (Vol. II, Section 5.0). Figure 22 shows several county, state, and federal jurisdiction boundaries in the CINMS region.

Tribal Agencies and Organizations

The Chumash are the indigenous people of the Channel Islands and surrounding region. The coastal portion of the Chumash homeland stretches from north of Morro Bay to Malibu Point in the south, and encompasses the northern Channel Islands. The original homeland area includes the total counties of San Luis Obispo, Santa Barbara, and Ventura, as well as portions of Kern and Los Angeles counties. There are a number of Chumash bands active and living within these areas, for example, Coastal Band of the

²¹ Available online: <http://www.usscplus.com/online/index.asp?case=3810139>.

Chumash Nation, Barbareño Chumash Council, Barbareño-Ventureño Chumash, Northern Chumash Tribal Council, Bakersfield Chumash Council, and the Santa Ynez Band of Chumash Indians, among others. Most are acknowledged by the State of California as California Indians, and the inland band of Santa Ynez Chumash also has federal recognition status. More information about the Santa Ynez Band is provided below.

The Sanctuary Advisory Council's Chumash Community representatives as well as the Chumash Community Working Group draw their membership from within all these Chumash tribal groups. Members of the Chumash Community Working Group advise and make recommendations to the Sanctuary Advisory Council concerning Chumash community-related issues, activities or interests at or near the Channel Islands. Similarly, the Chumash Community representatives who serve on the Advisory Council advise and make recommendations to the Sanctuary Superintendent about Chumash community concerns. The Sanctuary highly values its partnership with the Chumash community and looks forward to expanding it.

Santa Ynez Band of Chumash Indians

A goal of Executive Order 13175 is that agencies consult with officials from federally recognized tribes in the development of regulatory policies that have tribal implications, as defined in the order. Such consultation is to occur on a government-to-government basis. The Santa Ynez Band of Chumash Indians is a federally recognized tribe, and sovereign nation with its own constitution and governmental organization. NOAA should, as appropriate, convene a government-to-government consultation with the Santa Ynez Band during regulatory processes to determine what, if any, tribal implications exist. Tribal leadership includes, but is not limited to, a Tribal Chairman and Business Committee, a Tribal Elders Council, the Santa Ynez Chumash Environmental Office, and an Education Committee and Education Program Director (Santa Ynez Band of Chumash Indians (2004).

Federal Agencies and Related Organizations

The National Park Service (NPS)

The NPS is housed within the Department of the Interior and includes the Channel Islands National Park (CINP). The NPS conserves scenery, national, and historic objects and wildlife and provides for the enjoyment of those resources in a manner that will leave them unimpaired for the enjoyment of future generations. CINP's proprietary jurisdiction extends out to one nmi offshore around Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara islands, and non-proprietary jurisdiction extends out to one mile offshore from San Miguel Island. This one nmi of jurisdiction overlaps with the jurisdiction of the Sanctuary.

The NMSP and the NPS are committed to working closely together on the protection and management of shared marine resources across the country. In the Channel Islands region, CINP is an active and integral Sanctuary partner on projects ranging from enforcement, to education and outreach, and research and monitoring. CINP has one member and one alternate seat on the Advisory Council.

The Pacific Fishery Management Council (PFMC)

The PFMC is one of eight regional fishery management councils established by the Magnuson-Stevens Act for the purpose of managing fisheries within the EEZ. The PFMC is responsible for select fisheries off the coast of California, Oregon and Washington. The regulation of fishery resources in national marine sanctuaries is a collaborative process where Sanctuary Superintendents work with other fishery managers, including councils such as the PFMC, to ensure fishery resources are protected.

The U.S. Navy

The U.S. Navy operates the Ventura County Naval Complex. This complex controls 36,000 square miles of Special Use Airspace over the Pacific Ocean providing the Navy with a realistic operational environment for the safe conduct of controlled air, surface and subsurface launched missile tests, aircraft tests and fleet exercises involving aircraft, surface ships and various targets. Also known as the Point Mugu Sea Range, this area includes the northern Channel Islands and San Nicolas Island. The Navy owns both San Nicolas and San Miguel islands and leases property on Santa Cruz Island. However, San Miguel Island is jointly managed by the Navy and the CINP. The Navy has provided important support for various Sanctuary research efforts (ships, submarines, remotely operated vehicles, etc.).

The U.S. Air Force

The U.S. Air Force in the region is based at Vandenberg Air Force Base (VAFB). VAFB, located on approximately 98,000 acres in western Santa Barbara County, is headquarters for the U.S. Air Force 30th Space Wing. The Air Force's primary missions at VAFB are to launch and track satellites in space, test and evaluate America's intercontinental ballistic missile systems, and provide aircraft operations in the western range. The installation also supports aircraft and helicopter training and testing programs along the base's coastal area.

The Navy and the Air Force share one seat on the Advisory Council. These Advisory Council members formed a military activities working group providing invaluable support explaining Department of Defense related activities.

The U.S. Coast Guard (USCG or Coast Guard)

The USCG is a military, multi-mission maritime service that is also one of the nation's five Armed Forces. The Coast Guard's diverse missions include homeland security, search and rescue, law enforcement, marine safety, environmental protection, spill response, migrant interdiction, fisheries enforcement, drug interdiction, national defense, aids to navigation, and more. As the nation's primary maritime law enforcement agency, the Coast Guard has broad responsibility for enforcing all federal laws and regulations throughout the Sanctuary and assists NOAA in the enforcement of Sanctuary regulations. The USCG has one member and one alternate seat on the Advisory Council.

The Minerals Management Service (MMS)

MMS is the bureau of the Department of the Interior regulating the nation's oil and natural gas resources in the outer continental shelf (OCS), as well as leases pertaining to these resources. Management responsibility for OCS lands offshore California, Hawaii, Oregon, and Washington resides with the MMS Pacific OCS Region located in Camarillo, California. The CINMS boundary extends into the federal OCS approximately three nmi.



Figure 23. U.S. Coast Guard vessel, Santa Barbara Channel (Laura Francis)

MMS contributes significant funds and resources to marine research projects in the Channel Islands region. The Sanctuary sometimes uses MMS research results in support of Sanctuary management.

MMS is also responsible for ensuring safe practices among the various oil and gas entities operating within the Santa Barbara Channel. MMS has one member and one alternate seat on the Advisory Council.

The U.S. Fish and Wildlife Service (USFWS)

USFWS is housed within the Department of the Interior. USFWS works to conserve, protect, and enhance fish (freshwater species), wildlife, and plants and their habitats. USFWS shares responsibility with NOAA Fisheries for implementing the Marine Mammal Protection Act and the Endangered Species Act (USFWS is responsible for managing sea otters, walrus and brown pelicans; NOAA Fisheries is responsible for all other marine mammals).

The Environmental Protection Agency (EPA)

The EPA helps to protect Sanctuary water quality by performing such activities as regulating sewage outfalls (via National Pollutant Discharge Elimination System Permits) and ocean dumping (under Title I of the Marine Protection, Research, and Sanctuaries Act).

U.S. Geological Survey (USGS)

The USGS is a bureau within the Department of the Interior providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy and mineral resources; and enhance and protect our quality of life. The USGS has no regulatory or management mandate. Scientists within the USGS work within four disciplines: biology, geography, geology and water. Scientists at the USGS Channel Islands Field Station (part of the Biological Resource Division, Western Ecological Research Center) conduct research on the ecology and conservation biology of sensitive plants and animals at the Channel Islands and along California's coast. In addition to CINMS, the field station supports information needs of the National Park Service, U.S. Fish and Wildlife Service, Department of Defense, California Department of Fish and Game and other state and federal clients. In addition, the USGS Coastal and Marine Geology Program's Western Region conducts multidisciplinary scientific research in the coastal and offshore areas of California, as well as Oregon, Washington, Alaska, Hawaii, and other Pacific islands and waterways of the United States.

State of California

The CINMS coordinates with the State of California in implementing many of its programs as well as its regulations. The CINMS and the various state resource agencies work in partnership to protect the resources in the CINMS. The state's jurisdiction in the Sanctuary extends three nmi offshore from the mean high tide line.

Since the Sanctuary's designation, the NMSP has enjoyed a close partnership with the State of California in achieving effective resource protection for the marine waters surrounding the Channel Islands. With four national marine sanctuaries designated in California, the NMSP and State of California are strong partners in protecting California's exceptional natural and historical/cultural marine resources, providing effective cooperative enforcement of Sanctuary and state resource protection laws, conducting vital ocean research and monitoring, delivering state-of-the-art public education services, and planning together to sustain and protect California's coast and ocean. California has been a leader in ocean and coastal management and continues to lead important initiatives for improving the management of fisheries, introduced species, marine protected areas, water quality, historic resources, and coastal development.

In 2004 California Governor Arnold Schwarzenegger adopted *Protecting Our Ocean: California's Action Strategy* (CRA and Cal EPA 2004). This forward-looking plan of action for ocean and

coastal management in California places a focus on ecosystems and stewardship closely paralleling the NMSP mandate and corresponding CINMS goals, underscoring the opportunity for CINMS/ state collaboration on a wide array of issues. Many of the challenges highlighted in California's ocean action strategy have also been identified as priorities in this management plan and the FEIS. As CINMS and the NMSP work closely with the state to help achieve the goals of California's ocean action strategy, the Sanctuary will benefit from the partnership and make important progress on implementing the strategies contained in this management plan.

The California Resources Agency (Resources Agency)

The Resources Agency is a cabinet-level agency responsible for the conservation, enhancement, and management of California's natural and cultural resources. The Resources Agency oversees the activities of 19 state departments, boards, commissions and conservancies, including the Department of Fish and Game and the California Coastal Commission. The Resources Agency, and in particular the Ocean Resources Management Program, is an integral Sanctuary partner, working with CINMS to develop successful relationships with state entities and collaborating on several regional marine resource protection projects. In addition, Resources Agency staff have been instrumental in mutual efforts to integrate Sanctuary and state policies, and along with the California Environmental Protection Agency produced the state's ocean action strategy: *Protecting Our Ocean: California's Action Strategy* (CRA and Cal EPA 2004). While the Resources Agency does not implement specific prohibitions or regulations, individual entities under its oversight do. CINMS maintains close working partnerships with several of these entities, including:

- *The California Coastal Commission (CCC)* was established in 1976 by the California Coastal Act for the purpose of planning and regulating water uses consistent with the comprehensive set of specific policies for the protection of coastal resources and the management of orderly economic development throughout the coastal zone. Activities in state waters must comply with the policies established by the California Coastal Act. In addition, federal activities affecting any land or water use or natural resource of the coastal zone must be conducted in a manner which is consistent with these policies to the maximum extent practicable, and activities which require a federal license or permit must be conducted in a manner consistent with the enforceable policies. The CCC holds a seat on the Sanctuary Advisory Council and assists CINMS in developing water quality protection strategies.
- *The California Department of Fish and Game (CDFG)* and the Fish and Game Commission regulate and manage a wide variety of activities affecting the fish and game resources found on the land and in water areas under state jurisdiction. The CDFG is responsible for habitat protection and maintenance of California's marine resources. It is also responsible for management of fish and game stocks for commercial and recreational use. The CDFG retains jurisdiction of fisheries management in state waters, coordinates with NMFS, and represents the State of California as a member of the Pacific Fishery Management Council. Management of fisheries in the CINMS is administered by CDFG in state waters and NMFS in federal waters. The Pacific Fishery Management Council (PFMC) provides recommendations to NMFS regarding fishery management and fishing regulations. When issues arise that affect fisheries management, the CINMS coordinates with the respective agencies to identify the appropriate action for that agency to pursue. In the event the CINMS thinks regulations to restrict fishing are appropriate, it pursues a formal process with fishery management agencies, as described in Section 304(a)(5) of the NMSA (16 U.S.C. 1434 (a)(5)). More commonly, the CINMS also coordinates with the CDFG on marine research activities, enforcement measures to protect marine resources (*e.g.*, enforcement of state marine reserves and state marine conservation areas

within the Channel Islands MPA network), protection of endangered species, protection of migratory birds, and coordination of oil spill response and contingency planning.

- *The California Fish and Game Commission* is involved in the management of California's fish and wildlife resources. Formed in 1870, the Commission is composed of up to five members who are appointed by the Governor and confirmed by the state Senate. The Commission meets to publicly discuss various proposed regulations, permits, licenses and management policies, including fisheries issues. In addition, the Commission has general regulatory powers for state fisheries management. For example, the Commission decides on levels and methods of take for commercial and sport fishing. Sanctuary staff regularly attend Commission meetings to offer testimony and scientific expertise to inform pending Commission decisions. In 2002, the Commission voted to establish a network of state marine protected areas within the Sanctuary.
- *The California State Lands Commission (CSLC)* manages and protects the sovereign lands of the state pursuant to section 6301 of the California Public Resources Code. These lands include the beds of California's naturally navigable rivers, lakes, and streams, as well as the state's tide and submerged lands along California's more than 1,100 miles of coastline, extending from the mean high tide line out to three nmi offshore. The CSLC's policies for the management of the state's lands and natural resources are based upon the highest standards of environmental protection, financial responsibility and the Public Trust Doctrine, which imposes a duty to preserve the public's lands for the use and enjoyment of future generations. The CSLC was created by the California Legislature as an independent body, composed of three members- the Lieutenant Governor and State Controller, both statewide elected officials, and the Director of the Department of Finance, a cabinet level officer appointed by the Governor. The CINMS coordinates with the CSLC on projects altering the seabed such as the protection of submerged cultural resources. With regard to public trust lands, the CSLC has adopted regulations for the protection and use of public trust lands in the coastal zone. Administration of state lands includes leasing of these lands for various legislatively authorized purposes, regulation of ballast water under the Marine Invasive Species Act, and protection of state property held in the public trust such as submerged shipwrecks. The CSLC also regulates activities pursuant to leases for oil and gas development to ensure they proceed safely and marine resources are adequately protected. In some cases, the jurisdiction of CINMS regulations may overlap those of the CSLC and while ownership of the lands out to three nmi lies with the State of California, management and permitting issues are coordinated between the two agencies.
- *The California Historical Resources Commission (HRC)* is the state agency responsible for the preservation of representative and unique archaeological, paleontological, and historical sites in the land and water areas of the state.

The California Environmental Protection Agency (Cal/EPA)

Cal/EPA works to restore, protect, and enhance the environment, to ensure public health, environmental quality, and economic vitality. The Sanctuary works with two boards overseen by Cal/EPA:

- *The State Water Resource Control Board (SWRCB)* and the nine Regional Water Quality Control Boards (Regional Boards) have primary authority for regulating water quality in California. The authority to administer National Pollutant Discharge Elimination System (NPDES) permits has been delegated by EPA to the SWRCB and by the state to the Regional Boards. The SWRCB is the regional lead in water quality management and assists CINMS in developing water quality protection strategies. SWRCB is also the statewide lead in assessing water pollution from large vessels. Two regional boards share jurisdiction over the Channel Islands and within the

Sanctuary. Water quality on and around San Miguel, Santa Rosa, and Santa Cruz islands is under the jurisdiction of the Central Coast Regional Board. Water quality on and around Santa Barbara and Anacapa islands is under the jurisdiction of the Los Angeles Regional Board.

- *The California Air Resources Board (ARB)* is charged with the maintenance and enhancement of the ambient air quality of the state. The ARB has set air quality standards designed to meet National Ambient Air Quality Standards and delegated their implementation to local Air Pollution Control Districts. The ARB consults with CINMS on vessel traffic issues in the Santa Barbara Channel.

Local Government Agencies

The County of Santa Barbara

The County of Santa Barbara regulates land uses within its boundaries, excluding incorporated cities, state operated universities, and federal lands. In the Channel Islands Santa Barbara County has land use authority from the mean high tide line landward on Santa Cruz and Santa Rosa islands. Santa Barbara County provides expertise on oil and gas development and is an active participant on the Advisory Council.

The County of Ventura

The County of Ventura regulates land uses within its boundaries, excluding incorporated cities, state operated universities, and federal lands. In the Channel Islands Ventura County has land use authority from the mean high tide line landward on Anacapa Island. The County has been instrumental in assisting Sanctuary education and outreach programs in the Ventura region, provided the Sanctuary's first office space in Channel Islands Harbor, and is an active member of the Advisory Council.

Coastal Municipalities

Coastal cities including, Oxnard, Ventura, Carpinteria, and Santa Barbara represent important existing and potential Sanctuary partners. For example, the Santa Barbara Waterfront Department leases office space and vessel slips to the Sanctuary while Oxnard, Ventura and Carpinteria are frequent hosts of Sanctuary events.

Tools For Formalizing Relationships

The CINMS superintendent uses various management tools to formalize interactions with other federal, state, and local agencies or the private sector including:

- *Memoranda of Understanding and Memoranda of Agreement* formalize in writing relationships between the Sanctuary and other entities for a specific purpose or project;
- *Interagency Agreements* are used to share expertise, equipment and/or personnel;
- *Grants/Cooperative Agreements* are financial assistance tools used to provide or receive certain funding for projects and/or products benefitting the public;
- *Contracts* are used to procure goods and services for the benefit of the Sanctuary;
- *Joint Project Agreements* are used for sharing costs equitably among participating entities in a joint project; and
- *Consultation* is communication between agencies, which occurs when one agency's activity may affect the resources of another.

Sanctuary Funding

Appropriations

Funding for the NMSP is derived primarily from federal appropriations and broken into two principal categories: funds for base budget and funds for capital facilities. The NMSP distributes its base budget funds to individual sanctuaries for site-specific core operations (labor costs for existing staff and other administrative expenses) and programmatic costs (the additional costs the Sanctuary incurs carrying out management strategies such as costs for printing, training, and additional contract labor, etc.). Capital facility funds supplement the site's base budget to cover costs of such things as exhibits, Sanctuary interactive kiosks, and visitor centers. Each action plan includes a table identifying costs for the individual strategies over the next five years (from the date of publication of this document). The tables provide a rough estimate of the programmatic costs needed to implement each of the strategies.

Additional Sources of Support

In addition to federal appropriations, CINMS leverages its abilities through partnerships, appropriate outside funding sources, and in kind services to assist in the implementation of the management plan.

The National Marine Sanctuary Foundation (NMSF)

The NMSF provides opportunities for the national marine sanctuaries through public and private sector partnerships. The NMSF continues to develop external funding opportunities for the NMSP's outreach and education programs and other resource protection efforts.

The Channel Islands Marine Sanctuary Foundation

The Channel Islands Marine Sanctuary Foundation was established in 1997 to increase the visibility and accessibility of CINMS. The Foundation Board is local and citizen-based, and works to raise funds and build stewardship for the Sanctuary. The Foundation has secured funding for specific Sanctuary projects, programs and products.

Federal, State, Regional and Local Agencies

Federal, state, regional, and local agencies participate in ongoing resource protection, management, monitoring, enforcement and permit programs carrying out Sanctuary objectives. Intra- and interagency relationships are formalized and common goals and objectives are identified. CINMS pursues opportunities to share staff, expertise and financial resources, as appropriate.

Nonprofit Organizations and Foundations

Nonprofit organizations and foundations have joined CINMS in numerous cooperative projects. For example, the Santa Barbara Museum of Natural History, the Ty Warner Sea Center, the General Services Foundation, and The Ocean Conservancy have all made a contribution of staff and/or financial resources in support of Sanctuary purposes.

Enforcement and Permitting

Enforcement

Sanctuary resource protection depends in part upon enforcement of Sanctuary regulations and other applicable state and federal statutes and regulations.²² The Sanctuary's approach to enforcement focuses on two specific components: 1) the use of interpretive enforcement²³ as a means to inform the public and encourage voluntary compliance, and 2) the legal enforcement of regulations.



Figure 24. NOAA aircraft on patrol in the Sanctuary (Ed Cassano)

Sanctuary regulations are enforced through the NOAA Office for Law Enforcement (OLE), United States Coast Guard (USCG), and interagency agreements, which allow NOAA to deputize enforcement officers from other federal and state agencies. The Sanctuary has individual enforcement agreements with USCG, CDFG, and the NPS. For example, enforcement officers from CINP are authorized to enforce CINMS regulations. CINMS continues to develop and update formal agreements among enforcement agencies (see Strategy EE.2 - Expanding Enforcement Efforts) for purposes such as ensuring effective enforcement of MPA network regulations.

Permitting

Permits are required in all sanctuaries for conducting activities otherwise prohibited by sanctuary regulations (CINMS regulations are discussed in the FEIS (Vol. II, Section 2.0) and are available at 15 CFR 922.70-922.74). Per Sanctuary regulations, the Director of the NMSP may issue a permit to conduct an activity in the Sanctuary otherwise prohibited by CINMS regulations provided the activity meets a set of criteria (15 CFR 922.74). The decision on whether or not to issue a permit is typically made by the sanctuary superintendent.

Specific permitting regulations vary from sanctuary to sanctuary. In general, many national marine sanctuaries may issue permits for such activities as research, education, and salvage. Some sanctuaries also have the authority to issue permits for activities that would further sanctuary management purposes, but that would not fall into any other existing permit category.

The permit application process requires the submittal of a project summary, including the exact location of activities, description of methods, rationale for use of the Sanctuary environment, explanation of environmental consequences, and plan for reporting results to the Sanctuary. Per CINMS regulations, the Director of the NMSP may issue a permit if they make certain findings, which address matters such as: the professional and financial responsibility of the applicant; the appropriateness of the methods envisioned to the purpose(s) of the activity; the extent to which the conduct of any permitted activity may diminish or enhance the value of the Sanctuary as a source of recreation, or as a source of educational or scientific information; the end value of the activity; and such other matters as may be deemed appropriate (15 CFR 922.74). CINMS permit program activities are discussed further in the Operations Action Plan.

²² For more information on enforcement under the NMSA, see sec. 307 of the NMSA at: <http://www.sanctuaries.nos.noaa.gov/natprogram/nplegislation/nplegislation.html>.

²³ Interpretive enforcement is an enforcement strategy in which voluntary compliance and stewardship are stressed through educational messages and literature on responsible behavior. Many state and federal resource management agencies across the United States now utilize this strategy.

SECTION III: ACTION PLANS



Figure 25. San Miguel Island (James B. Frederickson)

ACTION PLANS - BACKGROUND

What Are Action Plans?

Action plans are the means by which a sanctuary identifies and organizes the wide variety of management tools it employs to manage and protect its marine resources. Action plans allow the Sanctuary to clearly articulate the programs, projects, and regulations it uses to address the resource issues identified for this management plan and to fulfill the purposes and policies of the NMSA.

The strategies and activities in each of the action plans reflect the diversity and range of projects implemented by staff representing each of the Sanctuary's functional areas:

- Resource Protection;
- Research and Monitoring;
- Education and Outreach;
- Maritime Heritage;
- Community (Sanctuary Advisory Council) and Management Planning;
- Technology Integration and Management;
- Site Operations; and
- Office Administration.

These seven functional areas are supported by staff implementing the strategies in the action plans described below. Each strategy identifies which functional areas are responsible for implementation of the corresponding management actions.

How Were The Action Plans Developed?

Identifying the Issues

The first step in the development of these action plans was the identification of a set of current resource management issues. After initial identification, the issues were refined and prioritized over many months early in the management plan review. The first phase in the issue identification process was public scoping. Scoping meetings were held in six locations around the Channel Islands region between the months of June and August, 1999. Hundreds of comments were received via letters, email, and oral testimony at public meetings in the cities of Lompoc, Oxnard, Santa Barbara, Ventura, San Luis Obispo and Long Beach (a seventh meeting was held in Washington D.C.). Comments were wide-ranging and diverse and included community concerns, specific problems, and unmet needs for the Sanctuary (for a complete listing of the comments received during scoping, see http://channelislands.nos.noaa.gov/manplan/com_archive.html).

After the scoping meetings ended, CINMS staff compiled all the comments and organized them by subject, which led to several management issue "categories":

- Water quality;
- Public awareness and knowledge of the Sanctuary;
- Research and monitoring;
- Enforcement;
- Boundary redefinition;

- Human uses (certain recreational and commercial extractive activities, military activities, vessel traffic and mooring systems, oil and gas activities);
- Marine reserves;
- Sea otter management; and
- Administrative issues, such as a need for Sanctuary performance standards, and improved inter-agency coordination.

Working from this list, CINMS staff began working with the Sanctuary Advisory Council to identify a set of priority issues for the management plan. At the January 2000 meeting of the Council, CINMS staff detailed a prioritization process they had been using in internal discussions to begin ranking the various issues. This process used various criteria, such as staffing and budget resources, jurisdictional and political feasibility, ecosystem protection needs, etc.

Based on this process, staff identified and presented to the Council a recommendation for (at least) ten priority issues to be addressed by the Sanctuary program areas in the management plan: 1) water quality; 2) military activity; 3) oil and gas activity; 4) large vessel traffic; 5) emergency response; 6) recreational and commercial uses; 7) research uses; 8) maritime heritage resource protection; 9) boundary redefinition; and 10) education and outreach.²⁴

Over the next several Advisory Council meetings (from March 2000 to February 2001), CINMS staff reviewed and refined various aspects of these ten general issue categories with Advisory Council members by discussing important factors such as information needs and resource requirements. In addition, CINMS staff worked both internally and with NMSP headquarters staff to refine and characterize the issues. Sanctuary staff, for example, collected background information on the specific threats each of these issues posed to the Sanctuary region and its resources. As the final issue characterizations matured, CINMS and NMSP headquarters staff, in conjunction with the Advisory Council, then began considering actions (both new and existing) the Sanctuary could take to address the issues and their specific threats (for descriptions of these meetings with the Advisory Council, see the Advisory Council meeting minutes at <http://channelislands.nos.noaa.gov/sac/minutes.html>).

Drafting Action Plans

Working from the list of priority issues, and the concepts for existing and new actions to address those issues, CINMS and NMSP headquarters staff developed criteria for selecting the issues and actions to be incorporated into action plans. Staff conducted a gap analysis to determine which issues were not addressed through existing actions, and in instances where staff were addressing a given issue, they evaluated their success in doing so. Staff then considered the feasibility, available staff expertise, and appropriateness of each existing or proposed action, along with existing or potential partners for implementing each action. Actions collectively addressing particular sub-issues were then grouped into strategies within each action plan.

²⁴ Two important issues that emerged from the scoping meetings, marine reserves and sea otters, were left off of this list for specific reasons. Marine reserves were addressed as part of a separate process from the management plan focused on establishment of the Channel Islands MPA network. The issue of sea otters was deferred to the U.S. Fish and Wildlife Service, who manage the animals under the Marine Mammal Protection Act and the Endangered Species Act. However, issues associated with marine zoning and sea otters are described in the Resource Protection Action Plan within this management plan.

In early 2000, staff began drafting initial action plans, such as Research and Monitoring, Marine Resource Protection, Education and Outreach, and Submerged Cultural Resources.

Soon after, the NMSP began initiating a directed and comprehensive overhaul of the internal processes and criteria used for building management plans. As such, the first CINMS action plans went through numerous iterations over the next several months so they would include all of the components emerging as part of a programmatic standard for action plans.

The final set of action plans in this management plan incorporate the latest programmatic standards. They have been vetted through several internal reviews at both the Sanctuary office in Santa Barbara and the NMSP headquarters office in Silver Spring, Maryland and directly reflect the priority issues identified by the Advisory Council and the CINMS staff, many of the original scoping comments of 1999, and the resource management responsibilities and directives established by the NMSA. There are nine action plans in this management plan:

1. Public Awareness & Understanding;
2. Conservation Science;
3. Boundary Evaluation;
4. Water Quality;
5. Emergency Response & Enforcement;
6. Maritime Heritage;
7. Resource Protection;
8. Operations; and
9. Performance Evaluation.

How Are Action Plans Organized?

Each action plan is organized around three principal sections. The first section provides introductory and supporting information for the action plan. An *Overview* summarizes the action plan's purposes and needs. A *Description of The Issues* summarizes the various management issues associated with the action plan. *Addressing the Issues* identifies the management strategies and regulations²⁵ CINMS will use to address the issues.

The second section details the action plan's strategies by providing such information as a strategy *Background*, which presents a brief overview of the strategy's purpose and need and *Activity Descriptions*, which summarize the specific means by which the strategy will be implemented. For each activity listed, there is a summary description of the activity, along with information about the status of the activity, and partners involved in it. The status information includes when the activity began, or is planned to be initiated, and with what frequency it occurs. In some cases, the status may refer to years 1-5. These refer to the years following adoption of the management plan. For example, since the management plan was adopted in 2009, year 1 refers to 2009. A complete list of all strategies included in this management plan is presented below in Table 3. The partners listed for each activity provide resources to implement it, such as funding, staff time, equipment, or other resources.

The third section of each action plan consists of a summary table providing estimated annual costs for implementing each strategy. All of these costs are approximate calculations intended to provide estimates

²⁵ Regulations are included in this section as part of the suite of management tools that CINMS uses to address the particular issues associated with the action plan. Details on any new regulations or modifications to existing regulations that were proposed as part of this management plan review are not provided in the management plan; a detailed description and full analysis can be found in Section 2.0 of the FEIS.

of the necessary costs of implementing each strategy. The availability of funds is contingent upon the federal appropriations process, which can change from year to year.

This organizational framework is the same for each action plan. This framework is applied so each action plan conveys information in the same straightforward and uncomplicated style. The reader should come away from each action plan with an understanding of two points: 1) the particular resource management issue associated with the action plan; and 2) the ways in which CINMS plans to address it.



Figure 26. Sea star (Dan Richards)

Framework for Determining When the Sanctuary Should Develop Additional Action Plans

The Sanctuary must be prepared to address new and emerging issues, including by developing new action plans. The Sanctuary, in consultation with the Sanctuary Advisory Council, will consider the following in order to assess and prioritize new and emerging issues:

- Does the issue pose a potential threat to CINMS resources or qualities?
- What is the rate at which the issue or potential threat is growing or emerging?
- What is the scale, complexity, intensity, duration, and geographic extent of the issue?
- Does the issue fall within the Sanctuary's mandate?
- Does the Sanctuary have the jurisdiction and/or authority to address the issue?
- What is the degree of public and Advisory Council interest in Sanctuary involvement in the issue?

Depending on the answers to these questions, the Sanctuary may opt to address the issue in question by one or more of the following means:

- Consulting with local, state, federal, or tribal agencies with a leading or shared authority for addressing the issue;
- Commenting on local or regional private sector or government projects;
- Forming a working group, via the Advisory Council, to develop options for addressing the issue;
- Addressing the issue through existing CINMS programs (*e.g.*, education, outreach, research, or monitoring) and action plans; and/or
- Developing a new action plan.

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PUBLIC AWARENESS & UNDERSTANDING ACTION PLAN

Overview

The primary objective of this action plan is to promote an understanding of the unique natural and historical²⁶ resources of the Sanctuary. Since CINMS' designation as a sanctuary in 1980, the Education and Outreach Program has been the cornerstone of resource protection efforts. Through community and regional partnerships in education, CINMS has reached out to a broad spectrum of the public, exposing them to not only the biological, physical, and intrinsic value of the Sanctuary, but also the impacts human activity can have on this invaluable resource. Developing a personal sense of ownership and responsibility is the key to building stewardship. As stewards of the marine resources, the public can better identify opportunities for protection and enhancement of the Sanctuary through conservation-based efforts and activities.

Description of the Issues

Section 301(b)(4) of the NMSA indicates one of the purposes of the National Marine Sanctuary Program is 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 (16 U.S.C. 1431(b)(4)). Enhancing these characteristics in the public is highly challenging and never-ending given the continuous stream of new information about the Sanctuary, and population dynamics of the southern California coastal region. New information about the Sanctuary results from improved understanding of known resources as well as new discoveries of natural and maritime heritage resources, varying conditions of the Sanctuary ecosystems, and the adaptive management scheme applied to Sanctuary resources by CINMS and its partner regulatory agencies. In addition to perpetually sharing new information with the public, education and outreach staff are tasked with reaching increasing numbers of people from many different cultural backgrounds.

Improving Awareness and Understanding

Through the course of management plan review the public, Sanctuary Advisory Council members, and Sanctuary staff have recognized several specific issues related to public awareness and understanding. Input from the public came in the form of comments from 1999 public scoping meetings.²⁷ One of the issues emerging from the public scoping process was a lack of public understanding about the Sanctuary, its resources, purpose, location, rules and programs. Many community members felt addressing the lack of awareness and basic knowledge about the Sanctuary is something CINMS should make a priority in the revised management plan. CINMS staff, in conjunction with the Sanctuary Advisory Council (Advisory Council), also acknowledged the fact that education and outreach are an integral part of Sanctuary management and are mandated by the NMSA. Other general scoping comments included:

- The Sanctuary should continue to inform the public about the Sanctuary, its boundaries, resources and authorities;

²⁶ "Historical" is used to include cultural and archeological resources. See 15 CFR 922.3.

²⁷ Since several public scoping meetings were held in San Luis Obispo, Los Angeles and Washington D.C. (communities beyond the Sanctuary's major outreach efforts in Santa Barbara and Ventura counties), many comments from those regions reflect less familiarity with the Sanctuary. Furthermore, public scoping comments do not reflect Sanctuary outreach efforts made since 1999.

- The Sanctuary should support efforts to improve marine education in the public school system;
- The Sanctuary should emphasize connections between watersheds and ocean systems in education programs and products;
- The Sanctuary should identify and target specific user groups on the resource impacts of their activities;
- CINMS education and outreach should be expanded outside of Santa Barbara;
- The Sanctuary should provide more public education opportunities;
- The Sanctuary should continue to foster a stewardship ethic;
- To improve safety, the Sanctuary should improve and expand its public service tools, such as weather reporting capabilities; and
- The Sanctuary should do more to reach non-English speaking communities.

Since the 1999 public scoping period, the Sanctuary has been thrust into the spotlight by two projects that have received much national attention: 1) the Channel Islands MPA network designation and implementation process, and 2) *JASON XIV - "From Shore To Sea."*²⁸ The Channel Islands marine protected area (MPA) network process, which began in 1999, has drawn the attention of academic institutions, policy makers, fishermen, resource managers and conservationists worldwide. MPA network education and outreach programs engaging this diverse array of constituents has been an important and



Figure 27. *JASON XIV broadcasts about the Channel Islands, such as this one led by Dr. Bob Ballard, reached over one million students around the world. (Robert Schwemmer)*

outreach staff continue to strive for enhanced public awareness and understanding about CINMS and its unique natural and maritime heritage resources.

unique Sanctuary contribution to the process. From 2001 to 2003, the Sanctuary was a major partner in *JASON XIV: From Shore To Sea*. This project generated extensive regional, national and international interest in the Channel Islands with 8,000 local and over one million national and international students participating in the live broadcasts and online digital labs. The Sanctuary contributed to *JASON XIV* by developing storyline themes and by providing data, content resources and staff support. Through these projects and other efforts described in this action plan Sanctuary education and

²⁸ The JASON Project is a multi-disciplinary education program founded in 1989 by Dr. Robert Ballard and administered by the Jason Foundation for Education. Each year JASON participants explore a different region of the earth using science, math, and technology. *JASON XIV* focused on the Channel Islands.

Population Growth and Cultural Diversity

The challenge of enhancing awareness and understanding about the Sanctuary is exacerbated by population growth and cultural diversity along the southern California coast. CINMS is located adjacent to Los Angeles, one of the largest metropolitan areas in the United States. The latest U.S. Census estimates the population of the Los Angeles metropolitan area (composed of Los Angeles, Orange and Riverside counties) at approximately 16 million (U.S. Census Bureau 2000a), up 12.7% since 1990 (U.S. Census Bureau 1990). The same census estimates indicate the population of coastal counties bordering the Sanctuary (Santa Barbara and Ventura counties) is over 1.1 million, up 10% since 1990. These population growth rates present a challenge to reach ever-more members of the public with information about the Sanctuary. Furthermore, this growing population consists of numerous ethnic groups: white 60%, non-Latino white 47%, Latino 32%, Asian 11%, black 7%, American Indian 1%, and Pacific Islander 0.3%, (U.S. Census Bureau 2000a). Within these ethnic groups are people from numerous cultural backgrounds, with a variety of language traditions. For example, the Latino K-12 student enrollment was 57% of the total enrollment in Santa Barbara County schools in 2005 (California Department of Education 2007). Education and outreach staff must assess how best to reach these different cultural groups, which is an effort requiring cultural awareness and understanding and demands far more than translating Sanctuary information into multiple languages. Southern California's expanding population and complex cultural diversity challenge CINMS education and outreach staff to create meaningful connections with a vast and changing audience to increase awareness and understanding about the Sanctuary and its mandate to protect the fragile living and historical/cultural resources making this region unique.

Addressing the Issues – Strategies For This Action Plan

Each of the national marine sanctuaries has its own unique marine environment. Thus, education, outreach and interpretive efforts are tailored to site-specific ecosystems, cultural resources, human activities and resource management issues. CINMS education and outreach efforts are focused in two strategic areas: 1) *community involvement, partnerships and community program development* through interactive programs (training programs, workshops, special events, and school programs) and 2) *product development* (printed materials, website development, audio visual materials, signs, displays and exhibits) as critical education and outreach tools.

The education strategies in this action plan were developed with regional input from marine educators, user groups and concerned citizens. When possible, these programs and products will be implemented with a bilingual component in an effort to communicate to southern California's non-English speaking population. In addition, all education programs and products, from classroom educational materials to teacher training workshops, strive to correlate with California and National Science Education standards. CINMS evaluates its educational programs and products and uses performance measures to assess their success (see Strategy EV.1).

While addressing site-specific education and outreach needs, the CINMS Education Program also strives to fulfill the NMSP's national education plan by: 1) providing educational leadership in marine conservation and protection efforts; 2) promoting the Sanctuaries' identity with site-specific application of projects and products; and 3) establishing a standard of educational excellence to be upheld by all thirteen national marine sanctuary sites.

As individual sites, each of the sanctuaries works to develop stewards on a local and regional basis. Collectively, the thirteen sanctuaries work together to foster a national and global marine conservation ethic. Education and outreach provide essential tools for successful marine resource management. CINMS will evaluate the effectiveness of its education and outreach programs in an effort to meet the

NMSP performance measure that states “By 2010 all education programs implemented in national marine sanctuaries will be assessed for effectiveness against stated program goals and objectives and National Science Education Standards.”

Volunteers are viewed as a valued Sanctuary resource and a key to success in the implementation of CINMS’ education and outreach programs.

There are nine strategies in the Public Awareness and Understanding (AU) action plan:

- AU.1 – Education Program Development;
- AU.2 – Community Involvement/Volunteer & Intern Program Development;
- AU.3 – Team OCEAN;
- AU.4 – Developing Outreach Technology;
- AU.5 – Greater Southern California Outreach;
- AU.6 – Developing Education & Outreach Tools & Products;
- AU.7 – Visitor Center Support & Development;
- AU.8 – MPA Network Education; and
- AU.9 – Multicultural Education

Each of these strategies is detailed below.



Figure 28. K-12 education is an important part of CINMS management. (Laura Francis)

STRATEGY AU.1 – EDUCATION PROGRAM DEVELOPMENT

- *Objective:* To link local teachers with national efforts to improve ocean literacy.
- *Implementation:* Education and Outreach staff

Background

The Sanctuary recognizes the value of working with educators in local school systems to provide educational materials throughout local and regional K–12 programs, train teachers and give students first hand exposure to the Sanctuary. CINMS links local teachers to national efforts to improve ocean literacy by providing opportunities for teachers to integrate ocean studies into all disciplines, participate in field investigations, interact with the research community, learn scientific monitoring techniques, develop lesson plans and refine presentation skills. CINMS education staff use best practices when developing educational programming and stay abreast of current issues and changes in science and environmental education content standards by participating in annual education conferences and workshops put on by leaders in science education (California Science Teachers Association, National Marine Educators Association, etc.).

Activities (7)

(1) Develop Teacher Workshops. CINMS is working with community partners to conduct teacher-training workshops directed toward developing Sanctuary stewards. The purpose of these workshops is to provide teachers with materials and strategies for incorporating marine science, and specifically Sanctuary-related topics into their teaching practice. Workshops range from one day to one-week programs and longer workshops incorporate a field trip component to the Sanctuary. Most workshops target grade 6-12 teachers. Topics for workshops include: 1) Marine Science Technology including GIS; 2) Ocean-related concepts in physical, earth and biological sciences; 3) Field monitoring techniques for intertidal and offshore systems, and 4) historical resources. A CINMS “Teacher At Sea” Program was started in 2006 aboard the R/V Shearwater. Selected teachers work alongside researchers on seabird population studies and MPA network ROV monitoring, and other research projects in the Sanctuary. As part of their experience, teachers develop an online journal, a mini-unit of lessons, and present activities at regional or national conferences or submit articles for publication in professional education journals.

Status: This activity has been ongoing for several years and new workshops will be developed as necessary.

Partners: CREEC Network, Santa Barbara County Office of Education, Ventura County Superintendent of Schools Office, Los Angeles Unified School District, UC Santa Barbara Marine Science Institute, Center for Image Processing and Education, Gold Coast Science Network, Project Clean Water, other NGO’s, and resource agencies such as the Channel Islands National Park, West Coast National Marine Sanctuaries and Centers for Ocean Science Education Excellence (COSEE) West and California COSEE, NOAA Teacher at Sea Program

(2) Continue to Develop Education Programs Addressing Water Quality. Recognizing the critical role water quality plays in the health of Sanctuary resources, CINMS is working in partnership with local NGOs and agencies to develop a watershed education program taking a systems approach to understanding the types, range and extent of human use impacts on water quality and marine ecosystems. By establishing this link between the community and the Sanctuary, CINMS hopes to develop a more informed constituency to influence decision makers about system-wide water quality issues.



Figure 29. CINMS Education Coordinator Laura Francis conducts water sampling with teachers during a 2003 “Mapping an Ocean Sanctuary” GIS workshop. (CINMS)

The Coastal Watersheds Education Program includes the following components: 1) Web-based and classroom activities integrating and interpreting current research program data sets, such as *Plumes and Blooms* (a study of the impacts of storm runoff on the marine environment of the Santa Barbara Channel); 2) research and monitoring training programs for teachers onboard the Sanctuary research vessel to expand skills in developing field investigations; 3) involving students in local volunteer monitoring projects including water sampling and sandy beach

monitoring. Watershed education programs are linked to priority water quality issues and focus on educating the public about the causes and impacts of nonpoint source pollution to the marine environment. In 2006, the NOAA-funded California B-WET grant program was started in Santa Barbara and Ventura Counties. B-WET is a competitively based program that supports existing environmental education programs, fosters the growth of new programs, and encourages the development of partnerships among environmental education programs throughout the Santa Barbara and Ventura County watersheds. Funded projects provide Meaningful Watershed Experiences for students and Professional Development Opportunities for Teachers in the Area of Environmental Education. CINMS partners with schools and non-profits that are recipients of B-WET grants to ensure that Sanctuary messages are incorporated into these programs.

Status: This activity has been ongoing for several years and new education programs will be developed in conjunction with Strategy WQ.2.

Partners: South Coast Watershed Resource Center; Sea Center; CI Harbor Boating Instruction and Safety Center; Community Environmental Council; Surfrider Foundation; Heal the Ocean; Cabrillo High School Aquarium; UCSB Marine Science Institute; Santa Barbara Maritime Museum; Project Clean Water; County of Ventura and Channel Keeper, B-WET grant recipients

(3) Provide Content for Geographic Information Systems (GIS) “Mapping An Ocean Sanctuary” Educational Materials. *Mapping An Ocean Sanctuary* contains GIS educational materials specific to CINMS, designed for students in grades 6–12. CINMS provides the content and data sets for development of these materials, working in cooperation with other partners to complete the final product. Mapping An Ocean Sanctuary partners conduct regional and national workshops, held in Santa Barbara, Ventura, and Los Angeles counties.

A GIS-based teacher training program visually displays large databases so patterns and processes in the Sanctuary (a complex interface between natural and human activities) are revealed over time. GIS is an excellent tool to integrate across disciplines of science, geography and math, and to create a knowledge

base to better understand human use impacts on the marine environment. The purpose of the program is to provide: 1) GIS-based resources for teaching students about the role of the Sanctuary in resource protection; 2) opportunities for teachers and students to participate in field monitoring studies and data collection techniques contributing to the GIS database; and 3) “shared” information through GIS ARCIMS on the Internet. Mapping An Ocean Sanctuary allows teachers and students to collect and analyze data, spatialize the information using GIS, and begin to see trends over time between human interactions and impacts on the marine environment.

Modules within Mapping An Ocean Sanctuary include: Internet Resources, ArcView Skill Sheets, Exploring a Sanctuary, Environmental Stewardship, Invisible Boundaries, Protecting Our Seas and Environmental Monitoring. In 2003, CINMS worked with Florida Keys, Gray’s Reef and Stellwagen Bank national marine sanctuaries to develop a mini grant to expand this curriculum to the other sanctuary sites.

Status: Initiated in 2000; expanded in 2003; content upgrades in years 2 and 4

Partners: Center for Image Processing in Education; NGS; NSF; ESRI; UCSB; Ventura College, National Marine Sanctuaries

(4) Continue support of UC Santa Barbara’s Marine Science Institute Oceans to Classrooms marine science series. The Sanctuary is working collaboratively with researchers from the University of California at Santa Barbara (UCSB) on research and monitoring projects focusing on the Santa Barbara Channel. One component of the marine sciences series is the Floating Lab Program, which provides opportunities for students to participate in collaborative offshore research and monitoring conducted by UCSB’s Marine Science Institute and CINMS. Students gain exposure in the use of scientific information in natural resource protection. CINMS provides staff support for teacher workshops, content for the floating lab workbook, field itineraries, classroom teaching kits and pre/post trip curricula. CINMS will also provide the research platform for teacher workshops.

Status: Partnership with UCSB initiated in 2001; materials to be updated and staff support provided biannually or as requested by Floating Lab Program staff

Partners: UCSB researchers and area teachers

(5) Conduct Student Field Monitoring. CINMS is working with teachers and students to conduct intertidal and sandy beach monitoring programs and is part of a network of national marine sanctuaries (including Monterey Bay, Cordell Bank, Gulf of the Farallones, and Olympic Coast) coordinating teacher and student monitoring activities on the West Coast. The goals of the Long Term Monitoring Program and Experiential Training for Students (LiMPETS) program are to use field-based workshops and emerging technologies to engage teachers and students in marine monitoring efforts and to encourage collaboration and coordination among west coast sanctuaries. The network has established a web site, provides teacher training opportunities, and produces classroom and field toolkits. By engaging the K-12 community in marine monitoring, the network provides opportunities to explore local, state, and federal parks, reserves, refuges, and sanctuaries and foster stewardship for these important marine areas. By becoming involved in field-based science and monitoring efforts, teachers and students appreciate and understand nature’s complex inter-relationships and will support development of policies that lead to effective ecosystem management.

Status: Ongoing program since 2002, LiMPETS workshop held in 2002; program to continue across years 1-5

Partners: K-12 teachers from Santa Barbara, Carpinteria, Ventura, Oxnard, Lompoc and L.A. Unified School District High Schools, West Coast National Marine Sanctuaries, California Sea

Grant, University of California Santa Cruz, Farallones National Marine Sanctuary Foundation, COSEE West, University of California, Santa Barbara

(6) Partner with the Mobile Marine Education Van. In 2001, the Santa Barbara Museum of Natural History developed a Waves on Wheels (WOW) mobile van. The WOW program began as a partnership between the Channel Islands National Marine Sanctuary, Santa Barbara Museum of Natural History and County of Santa Barbara to develop a specially outfitted outreach van to take our dynamic marine education programs on the road to serve schools, libraries and community centers. The program began its tour in Santa Barbara County in 2002 and extended the reach to Ventura and Oxnard in 2004. The WOW program reached 6,000 teachers and students and the general public in the first year of operation. The WOW program supported the Sanctuary's mission of protecting marine life and habitats surrounding the Channel Islands and will help educate the public about the Sanctuary's goals, programs and current resource management issues. Program activities are linked to state and local science education standards and include hands-on activities focusing on topics such as: 1) species adaptations; 2) food webs; 3) ocean habitats; 4) predator-prey relationships and 5) endangered species. WOW uses dynamic instruction techniques to develop an understanding of the richness and complexity of life found in our local marine environment and teach the importance of ensuring continued preservation. In 2006, the University of California Marine Science Institute became a partner in the mobile education van through a Bay Watershed Education and Training (B-WET) grant. The program is now called the Mobile REEF and UCSB is currently outfitting the van with a chiller and live animal touch tank, and also with a mobile internally projected Magic Planet sphere that shows global data patterns.

Status: Program initiated in 2000; support to continue as needed through years 1-5

Partners: Santa Barbara Museum of Natural History, County of Santa Barbara, University of California Santa Barbara

(7) Participate in National Initiative strategies including the JASON Project, Immersion Institute, Sanctuary Quest, and Telepresence (Oceanslive!). The NMSP encourages each site to participate in national initiatives to foster a system-wide identity. CINMS will be hosting and coordinating a variety of national initiatives in the next 5 years as well as locally sponsored outreach events. CINMS will sponsor events linked to the JASON Project, Immersion Institute, Sanctuary Quest, and national telepresence initiative (see also AU.4, activity 3) to educate the local and national community about Sanctuary resources and research programs. Events may include ocean fairs/community days, live broadcasts from the Sanctuary via the Internet or to mainland viewing locations, teacher workshops and student argonaut programs.

Status: Ongoing since designation; to continue across years 1-5

Partners: The JASON Foundation for Education, NOS, National Park Service, and others

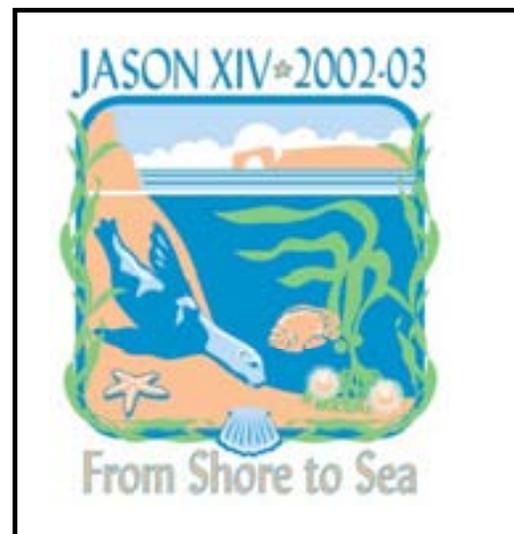


Figure 30. The JASON XIV logo

STRATEGY AU.2 – COMMUNITY INVOLVEMENT/VOLUNTEER & INTERN PROGRAM DEVELOPMENT

- *Objective:* To increase community awareness about the Channel Islands National Marine Sanctuary and the National Marine Sanctuary Program through the development of CINMS volunteers and interns.
- *Implementation:* Education and Outreach staff

Background

The Sanctuary recognizes the value of reaching the public through adult education venues and is actively working with local and regional city and community colleges to provide opportunities to learn about Sanctuary resources in a formal, higher education setting. Critical to Sanctuary operations, volunteers and interns are important human resources the Sanctuary considers among its greatest assets. Volunteers and interns help the Sanctuary accomplish many of its objectives.

CINMS draws on all members of the community to participate as volunteers. Through volunteer programs, CINMS strives to increase community awareness about the National Marine Sanctuary Program and develop stewards of CINMS. Volunteers provide a mechanism for involving the community in Sanctuary activities such as research and monitoring, education and outreach programs, Sanctuary events and functions, and office/administration duties.

In 2006, Channel Islands Naturalist Corps volunteers alone provided over 16,000 hours of service. This service is approximately equivalent to the work of eight full time equivalent (FTE) employees. In addition, CINMS internships provide opportunities for students from local, national, and international colleges and universities an opportunity to gain valuable work experience in, explore career options in, and contribute to: marine resource protection, research and monitoring, policy and planning, and education and outreach. CINMS interns may earn college credit, move on to higher education, or find interesting and productive marine-resource related employment. Sponsoring interns enables CINMS to raise awareness about the Sanctuary among the local college community as well as foster careers in marine resource management.

Another essential volunteer element of CINMS is the Sanctuary Advisory Council. While approximately half of the members of this advisory body serve as government representatives and are therefore paid by their employers to participate, the majority of individuals serving as community representatives volunteer their time to do so. Activities pertaining to the CINMS Sanctuary Advisory Council are discussed in Strategy OP.1 of the Operations Action Plan.

Activities (5)

(1) Provide Presentations at Regional and National Workshops and Conferences. To increase awareness among formal and informal educators about educational resources and programs available through NOAA, NMSP headquarters and CINMS, CINMS education staff present workshops and programs at a variety of regional and national conferences each year (such as the Southwest Marine Educators Association, California Science Teachers Association and National Marine Educators Association). Presence at these workshops and conferences also provides CINMS with an opportunity to demonstrate and distribute educational materials and products.

Status: Ongoing since designation; to continue annually

Partners: California Science Teachers Association, National Science Teachers Association, National Marine Educators Association and others

(2) Continue Adult Education Programs and From Shore to Sea Lecture Series. CINMS worked with Santa Barbara City College, Santa Barbara Maritime Museum, and Ventura College Community Services to offer adult education classes from 2001 - 2003. These evening classes covered the major program areas and resource issues of the CINMS. Classes usually had approximately 30 participants and include three, two-hour evening sessions. A field trip component with a boat trip to the Sanctuary was also included. This program provided adults with opportunities to learn about current resource management issues of the Channel Islands and Santa Barbara Channel. Class participants were encouraged to become volunteers for CINMS. During the JASON XIV From Shore to Sea Expedition to the Channel Islands in 2002-2003, these adult education classes evolved into a monthly "From Shore to Sea" lecture series that brings guest lecturers to Santa Barbara and Ventura to talk about research on the Channel Islands and surrounding waters. The From Shore to Sea Lecture Series was developed by CINMS and CINP. Since 2007, the Sanctuary has offered parts of this monthly lecture series as an adult education class with Santa Barbara City College.

Status: Ongoing since 2001; evolved into From Shore to Sea lecture series in 2003, From Shore to Sea Lectures occur in Santa Barbara and Ventura the second Tuesday and Wednesday of each month and are advertised through SBCC adult education

Partners: Santa Barbara City College, Ventura College Community Services, Santa Barbara Maritime Museum, Channel Islands National Park

(3) Maintain Interagency Interpretive Program with Channel Islands National Park. The National Park Service and the NMSP share a common goal of protecting sensitive marine ecosystems through the management of designated national parks and seashores and national marine sanctuaries. Channel Islands National Park (CINP) and CINMS created a strategic plan under the General Agreement between the NMSP and NPS to develop joint interpretive and educational projects and programs, including program planning, facilities design and operation, and on-site services to the public. The strategic plan addresses interpretive volunteer programs through inter-agency volunteer training, recruitment, and scheduling. This collaboration enables both agencies to more efficiently use local volunteers while providing a mechanism for both agencies to present a united front to the public. In 2005, CINMS and CINP created an additional Memorandum of Agreement (MOA-2004-188/1279) to create a full-time employee volunteer administrative support position to support interagency cooperation on volunteer and outreach programs.

Status: Initial development began in 2001; will continue to evolve over years 1-5

Partners: Channel Islands National Park

(4) Maintain the Great Annual Fish Count Program. The Great Annual Fish Count (GAFC) is made possible through a partnership between the NMSP and the Reef Environmental Education Foundation (REEF). Since its 1992 inception in CINP and CINMS, the GAFC now takes place every July in seven marine sanctuaries off the coasts of California, Florida, New England, Texas and Washington, as well as off the coasts of Georgia, Louisiana, North Carolina, Oregon and British Columbia (with outreach surveys in Belize). Volunteer scuba divers and snorkelers are trained throughout the year to collect data on fish species' diversity, abundance and distribution. The GAFC event takes place during the first week of July, although monitoring is carried out year-round. CINMS and REEF partner to conduct an annual four-day field survey with fish identification experts to fill in gaps in REEF and Sanctuary data sets. In 2006, a marine invertebrate component was added to the REEF program. Data are processed by REEF and used by many of the national marine sanctuaries as baseline data in which to measure changes over time.

Status: Initiated in 1992; to continue as an annual event

Partners: Channel Islands National Park, Reef Environmental Education Foundation, Paradise Dive Club

(5) Maintain the CINMS Internship Program. CINMS provides internships in marine resource protection, research and monitoring, policy and planning, and education and outreach on a year-round basis, as needed. Maintaining the CINMS internship program requires intern recruitment, placement, orientation, training, and supervision. In some instances internship stipends are arranged through Sanctuary partners such as the National Marine Sanctuary Foundation. Local, national, and international interns participate in the CINMS internship program. In 2006 and 2007, CINMS participated in the NOAA Ernest F. Hollings (Hollings) scholarship program. The program is designed to: (1) increase undergraduate training in oceanic and atmospheric science, research, technology, and education, and foster multidisciplinary training opportunities; (2) increase public understanding and support for stewardship of the ocean and atmosphere and improve environmental literacy; (3) recruit and prepare students for public service careers with the NOAA and other natural resource and science agencies at the federal, state and local levels of government; and (4) recruit and prepare students for careers as teachers and educators in oceanic and atmospheric science and improve scientific and environmental education in the United States. CINMS will continue to host Hollings Scholars each summer for 10-week internships. As part of the CINMS Multicultural Education Strategic Plan, Hispanic and under-represented youth are recruited for internships to become involved in CINMS programs (see strategy AU.9 activity 2).

Status: Formalized intern program initiated in 1998; to continue across years 1-5

Partners: UC Santa Barbara; Santa Barbara City College; California State University Channel Islands; Ventura and Oxnard Colleges; NOAA Hollings Scholarship Program; MERITO



Figure 31. Channel Islands Naturalist Corps, 2001 (Becky Swift)

STRATEGY AU.3 – TEAM OCEAN

- *Objective:* To build on the success of Team OCEAN Programs at other national marine sanctuaries by fully achieving the network's three primary goals.
- *Implementation:* Education and Outreach staff

Background

A 1999 national survey estimated more than 120 million people participated in some form of coastal and marine wildlife viewing or nature-based recreation in the U.S. - over 60% of all residents 16 and older. The California coast offers some of the best opportunities in the world to view marine wildlife in a variety of habitats and California ranked second only to Florida in terms of overall number of participants engaged in marine recreation (18 million). Marine wildlife can be disturbed or injured when marine recreation activities are conducted inappropriately. Similarly, inappropriate conduct may also cause injury in the participants involved in such activities. Public awareness about proper marine recreation and marine wildlife viewing conduct is necessary. One mechanism for the Sanctuary to provide awareness and understanding about proper marine recreation and wildlife viewing conduct is Team OCEAN (Ocean Conservation Education Action Network). Team OCEAN has three primary goals: 1) provide public education through one-on-one interpretation and a variety of informative brochures; 2) promote stewardship by instilling a sense of personal understanding, ownership and responsibility for the Sanctuary among the general public; and 3) establish a Sanctuary presence on the water, emphasizing the importance of proper use of our resources, now and for future generations. The Team OCEAN program was established in the Florida Keys National Marine Sanctuary and has been adopted at several sanctuaries including CINMS. Building on the success of programs developed at other sites unifies volunteer and outreach program messages and training programs on a national level.

Activities (4)

(1) Maintain the Channel Islands Naturalist Corps (CINC). The CINC program (part of the interagency interpretive program with Channel Islands National Park described in AU.2, activity 3) trains volunteers to educate the community about the culturally rich and biologically diverse resources found within the Sanctuary and Park. Over 100,000 tourists, school children, and local residents visit the Sanctuary annually on board whale watch vessels, marine floating classrooms, and natural history tours. CINC volunteers educate passengers, monitor Sanctuary resources, and collect data on board whale watch vessels departing out of Santa Barbara Harbor, Ventura Harbor, and Channel Islands Harbor. Data sets and images are used by Cascadia Research Collective and national whale distribution databases such as Journey North. The field season runs from January through October, capturing the presence of migrating gray whales and foraging blue and humpback whales. CINC volunteers also collect marine mammal sightings data, which is entered into the Sanctuary's online Marine Mammal Sightings Database. See Strategy AU.4 (4).

One of the functions of the CINC is bringing together the whale-watching industry on a number of Sanctuary-related issues. Whale-watching operators will be offered marine wildlife viewing workshops covering topics including Sanctuary regulations, the Marine Mammal Protection Act, and Endangered Species Act, and standardized whale-watching guidelines.

CINMS maintains and trains a base of over 150 CINC volunteers annually to provide naturalist interpretive services on whale-watching boats departing out of Santa Barbara, Channel Islands and Ventura Harbors. CINMS offers this as a service to the whale-watching industry (within the three

designated harbors) through a Memorandum of Understanding between the vessel operators and CINMS (NOS Agreement Code: MOA-2004-030/1121). Volunteers are available at varying times throughout the week and weekend. In addition, volunteers take their knowledge to the classroom by providing community outreach talks through the CINC Speaker's Bureau. CINC volunteers receive specialized training in identification, behavior and life history of marine mammals. The natural history of the Sanctuary, Santa Barbara Channel and the Channel Islands are emphasized. In addition, CINC volunteers receive training from the CINC to provide interagency interpretation on board CINC concessionaire vessels, and a subset of them receive special training to provide interagency interpretation on the islands.

Status: Program first began in 1995 and the "Whale Corps." CINMS initiated Naturalist Corps in 2001, and joined with CINC in 2004. Program to continue throughout years 1-5

Partners: Commercial whale-watching and marine excursion vessels; Cascadia Research Collective; Santa Barbara and Ventura County Schools; CIMSF; SBMM; Santa Barbara Museum of Natural History; Channel Islands National Park; National Marine Fisheries Service Office of Protected Resources

(2) Develop Sanctuary Marine Watch Volunteer Program. One of the goals of the NMSP is to allow multiple recreational and commercial uses of the Sanctuary compatible with resource protection. Recreational and commercial boats (whose impacts may be not only from consumptive activity, but from the boats themselves) can easily access CINMS' waters. Sewage discharge, pollution from fuel, illegal dumping, anchor-scarring, and seabird and marine mammal disturbance are all avoidable impacts. CINMS has developed a series of projects to involve volunteers and interns in activities to assist the site while educating them about the resources. Team OCEAN (Sanctuary Marine Watch), a volunteer-based, peer education program, will use interpretation to affect behavior and values to help achieve voluntary compliance with Sanctuary regulations. CINMS is building a volunteer-based, peer-interpretive enforcement program to work together with user groups in Sanctuary waters. Volunteers will impart information about Sanctuary resources, the benefits of protection, and the impact of the individual on the environment. Interpretive enforcement is intended to be both proactive and preventative in averting negative impacts before they occur.

Status: Initial program designed in 1998; boater consultations in 2003; pilot program to start in year 3

Partners: Recreational and commercial boating and diving industries; Channel Islands National Park; Chumash Maritime Association; local dive clubs; Santa Barbara Harbor; Ventura Harbor; Channel Islands Harbor; Department of Boating and Waterways; Clean Seas; Wildlife Care Network; Santa Barbara Maritime Museum; Santa Barbara Marine Mammal Center; Channel Keeper; USCG/Auxiliary; County of Ventura, Channel Islands Marine Sanctuary Foundation; NOAA Office for Law Enforcement; Sanctuary Education Team; United States Coast Guard Auxiliary

(3) Integrate CINMS Volunteer Program Strategies into NMSP Volunteer Efforts. CINMS will collaborate with multiple NMSP sites and the NMSP Volunteer Program Manager to integrate successful volunteer program strategies into a national volunteer plan. CINMS will provide data on hours and volunteers for the Channel Islands Naturalist Corps program, CINMS internship program, and other volunteer activities to the NMSP VolunteerNet web database. VolunteerNet was developed as part of the NOAA Strategic Performance Objective for Knowledgeable stewards: "Increase portion of population that is knowledgeable of and acting as stewards for coastal and marine ecosystem." In addition, the NMSP performance measure for volunteering (by 2010, increase by 25% the number of volunteer hours dedicated to NMSP science, public awareness, and resource protection activities) is reported on by using VolunteerNet. VolunteerNet was developed as a web-based tool for the purpose of recording, tracking,

and managing information on volunteer activities throughout the NMSS. In this capacity, VolunteerNet is intended to serve a twofold purpose: 1) Provide all volunteer coordinators with on-demand access to volunteer information and thereby facilitate greater administrative efficiency for managing volunteer labor; 2) Provide NMSP Headquarters with data on volunteer activities for reporting purposes; and 3) access to up-to-date volunteer contact information for communicating nationally.

Status: Establish by year 2 or in accordance with NMSP schedule

Partners: Multiple NMSP sites, Channel Islands National Park

(4) Engage in Ocean Etiquette Programming. The Ocean Etiquette Program seeks to develop guidelines and programs around responsible interaction with wildlife and habitats in the national marine sanctuaries. The NMSP, California national marine sanctuaries, and NOAA Fisheries have been working together to develop comprehensive guidance for viewing marine species and responsibly entering their habitats throughout the state. As a result, NOAA has created animal specific guidelines for every kind of ocean visitor in addition to the publication, "Responsibly Viewing California's Marine Wildlife: Handbook for Ocean Users". The handbook was developed to 1) promote voluntary compliance with existing federal and state wildlife protection laws and regulations, 2) raise public awareness about responsible viewing and stewardship principles, and 3) promote communication and coordination among California's ocean user groups and federal and state agencies.

In addition to the California wildlife viewing guidelines and the "Responsibly Viewing California's Marine Wildlife: Handbook for Ocean Users", CINMS and various partners are engaged in developing an Ocean Etiquette program at the site. This is a process that began with the handbook and subsequent workshops. The 2003 workshop was held at the release of the handbook to communicate the information contained in the book and gather initial community feedback. The 2004 Marine Wildlife Viewing Workshop was held to determine user group need for outreach messages and products, and to solicit further feedback on the handbook. Using feedback gathered at the 2004 workshop, the site and involved community user groups will address the next steps for product development. This may involve future workshops to bring together community user groups to discuss current issues pertaining to responsibly viewing California marine life. Community user groups include recreational and commercial boaters, recreational and commercial fishing interests, kayaking stores and guides, SCUBA divers, snorkelers, dive stores and dive vessel operators, whale watching vessels and sightseeing vessels, volunteers, naturalists, birders, and small aircraft operators. Additionally, CINMS will work with NMSP headquarters and other sites in developing outreach and management programs necessary for responsibly viewing wildlife in the Sanctuary if the need is identified through the Sanctuary, its partners or user groups.

Status: Program development began in 2003 and has continued to evolve; will be implemented across years 1-5

Partners: Cordell Bank, Gulf of the Farallones and Monterey Bay national marine sanctuaries; National Marine Sanctuary Program, National Marine Fisheries Service; CA Department of Fish and Game; California State Parks

STRATEGY AU.4 – DEVELOPING OUTREACH TECHNOLOGY

- *Objective:* To provide timely and accurate information about the Sanctuary’s natural resources, issues and activities as they occur
- *Implementation:* Education and Outreach staff

Background

CINMS will expand its virtual, real-time and interactive capabilities to provide a more immediate and direct understanding of the natural resources, issues and activities as they occur. Through the use of advanced outreach technology such as websites, Sanctuary interactive kiosks, and audio podcasts, diverse audiences will be able to engage with the Sanctuary in a more dynamic and participatory manner.

As an offshore site, the easiest way for the public to come into contact with the CINMS is through a virtual experience. CINMS’ website averages 10,000 unique visitors per month and offers everything from an online weather service to information on maritime heritage, the Advisory Council, the Channel Islands MPA network, research, an underwater video gallery and *What’s New* pages. The diverse habitats, resources and unique setting of the CINMS offer the opportunity for the interpretation of regional biogeography, prehistoric Native American Chumash artifacts, paleontological discoveries, and historic shipwrecks.

Activities (4)

(1) Expand Website Capabilities.

CINMS has developed a strong presence locally, nationally, and internationally through its website. The website is an important outreach tool enabling the Sanctuary to access and track thousands of monthly inquiries. The website also provides CINMS with a mechanism to provide important resource protection updates, list Sanctuary regulations, post Sanctuary Advisory Council meeting minutes, and information on education and volunteer opportunities. CINMS will expand its website outreach through the application of Internet technology in many different environments. CINMS will incorporate multi-media elements, including:



Figure 32. CINMS website homepage, 2008

- A dynamic shipwreck database - there are nearly 200 documented shipwrecks in the waters of the Channel Islands National Marine Sanctuary alone, this site will allow users to read about and watch online video explorations;
- Sound, streaming video and audio podcasting; and
- A marine mammal sightings database where you can record mammal sightings as well as search for them.

Taking these steps will allow the Sanctuary to deliver dynamic, real-time information to viewers and will be focused in the following areas: 1) improving communication with educators (distance learning for K–12, virtual teacher workshops, providing resources); 2) providing scientists, decision makers, and the

public easy access to CINMS research data base (intuitive querying of data, interfacing with GIS, interpretation of data for use in the classroom); and 3) providing visitors with a virtual experience and understanding about the Sanctuary (virtual flyovers and video capture from Sanctuary waters).

Status: Evolving since 2001; upgrades to continue across years 1-5

Partners: Various offices within NOAA; Sanctuary Education Team

(2) Increase The Number Of CINMS Interactive Kiosks. The Sanctuary and National Weather Service began exploring and developing touch-screen weather kiosks in 1998. Since then the Sanctuary and its partners have made great strides in improving and designing kiosk technology and content information for today's enhanced line of Sanctuary interactive kiosks. The first prototype Sanctuary interactive kiosk was installed at the Santa Barbara Museum of National History Ty Warner Sea Center in late April 2005. In the first 90 days of operation there have been over 2,100 users and nearly 300 hours of recorded use. The kiosk offers real-time weather information from the National Weather Service, site specific as well as National Program information. It also includes information from partners outside of NMSP. The kiosk program has gone through an extensive design process to come up with a "look and feel" that accommodates NMSP design standards, and guidelines from the federal Rehabilitation Act Section 508 and Americans with Disabilities Act (ADA).²⁹

The Sanctuary interactive kiosks offer a high-impact visual and auditory showcase of all the treasures the Sanctuary has to offer. Users can learn about the research projects, education, outreach and resource protection programs, and extensive information on Sanctuary species and habitats. With the click of a button users can view underwater video of local shipwrecks and research projects currently underway in the Sanctuary. The kiosks also provide real-time weather information from NOAA weather products, allowing users to check offshore marine forecasts, tides and currents, swell models and sea surface temperatures. The result of the program is a better and more meaningful experience for visitors who get to see and interact with Sanctuary resources in a way not before possible.

The National Marine Sanctuary Program user interface is one of the most in-depth and content rich kiosks anywhere. Maintaining the program's commitment to outreach and education, the kiosk serves as an interactive collection of knowledge and information. The kiosk offers a wealth of information that is just a few clicks away from the public in a simple and easy to use touch screen interface. Kiosk users interested in learning about the National Marine Sanctuary Program can read about the sanctuaries and where they are located as well as the goals of the program itself. A truly interactive and multimedia experience keeps users engaged as they watch videos on scientists at sea or underwater habitats. They can even take a "Visual Journey" though the waters of the sanctuaries and see what treasures are contained in the ocean. In 2006 a kiosk was installed at West Marine in Channel Islands Harbor.

To reach a broader audience, CINMS will install eight more Sanctuary interactive kiosks at key departure points to the Sanctuary. Kiosks will be installed at the following locations:

²⁹ Rehabilitation Act Section 508 requires that when federal agencies develop, procure, maintain, or use electronic and information technology, federal employees with disabilities have access to and use of information and data that is comparable to the access and use by federal employees who are not individuals with disabilities, unless an undue burden would be imposed on the agency. Section 508 also requires that individuals with disabilities, who are members of the public seeking information or services from a Federal agency, have access to and use of information and data that is comparable to that provided to the public who are not individuals with disabilities, unless an undue burden would be imposed on the agency. The ADA provides scoping and technical requirements for accessibility to buildings and facilities by individuals with disabilities.

- Santa Barbara Harbor (Santa Barbara);
- University of California Santa Barbara Outreach Center for Teaching Ocean Science;
- Santa Barbara Maritime Museum;
- Channel Islands Harbor fuel dock (Oxnard);
- Boating Instruction and Safety Center (Oxnard);
- Ventura Harbor (Ventura);
- Cabrillo High School Aquarium (Lompoc); and
- Long Beach Aquarium of the Pacific

Status: New kiosk prototype designed and installed in 2005; additional four sites by year 3

Partners: National Weather Service

(3) Participate in National Telepresence (Oceanslive!) Initiative. Telepresence takes advantage of cutting-edge technology to allow people to experience these special marine areas without ever getting wet. Using underwater cameras and scientific equipment, telepresence uses lightning-quick Internet2 connections to feed live, interactive video - as well as pre-recorded content - to distance learning centers, Boys and Girls Clubs after-school programs, exhibits in aquaria and interpretive centers, and a Web-based marine science portal. Combined with the resources of sanctuary marine science professionals, telepresence allows children, adults, and teachers a more meaningful educational experience. Through telepresence visitors do not passively view sanctuaries, but instead actively experience and explore these underwater worlds by taking control of underwater vehicles and cameras - an intimate, immersive experience. Telepresence greatly expands education and outreach possibilities for the NMSP and is expected to greatly increase public awareness of the program, especially among currently underserved audiences.

Since 2003, the NMSP has been engaged in planning activities to support the implementation of telepresence in CINMS. The Sanctuary is working in close partnership with Channel Islands National Park and the Ventura County Office of Education to place a series of underwater cameras in and around the Landing Cove on Anacapa Island, capturing a variety of environments. These cameras will not only serve the NMSP telepresence program, but also feed into the existing live broadcasts shown at the CINP visitors center in Ventura. The program is also working with the Marine Science Institute at UC-Santa Barbara to develop scientific monitoring equipment that can use this same, high-speed infrastructure.

Status: Under development since 2003; implementation to follow in years 1-2

Partners: CINP; Ventura County Office of Education; UCSB Marine Science Institute

(4) Maintain Interactive Marine Mammal Sightings Database. Over 18 species of marine mammals are documented annually by Channel Islands Naturalist Corps (CINC) volunteers (see AU.3, activity 1) in Sanctuary waters, including information on migratory species, resident species, strandings or entanglements, behavior, and associated marine life. In order to make the data more accessible to the public CINMS staff developed an interactive marine mammal sightings database in 2003. The database went online in early 2004 and enables the public to access and query marine mammal data collected primarily by CINC volunteers and Sanctuary staff. The public can also enter sightings into the database and create visual maps of data points.

Status: Developed in January 2004, maintenance in years 1-5

Partners: CINC volunteers; Signatory marine excursion vessels participating in the CINC program; Sanctuary Education Team

STRATEGY AU.5 – GREATER SOUTHERN CALIFORNIA OUTREACH

- *Objective:* To establish a presence and identity for the Sanctuary and its various programs in the Ventura and Los Angeles region.
- *Implementation:* Education and Outreach staff

Background

Increasing CINMS outreach to the greater Southern California area will help to: expand the Sanctuary's presence and identity in the Ventura and Los Angeles region; develop new education partners; provide education and outreach programs to new communities; and work towards building a larger and stronger constituency and stewardship of the Sanctuary. At the invitation of the Channel Islands Harbor in Oxnard, approximately 30 miles to the south of Santa Barbara, CINMS opened a southern office in 1999. The CINMS Ventura County Regional Office is located at the Marine Emporium Landing, "Gateway to the Channel Islands", and supports Channel Islands Harbor visitor walk-in traffic with CINMS displays and literature. Channel Islands Harbor, which is home to over 5,000 boat slips, supports a tri-county population base of 1,355,835 and is the closest mainland departure point to the CINMS, is the site of a new *Channel Islands Harbor Boating Instruction and Safety Center (CIHBISC)*. This Center will provide a forum in which to provide information about the Sanctuary for boaters in the Oxnard area. CINMS has also been able, and will continue to, provide Los Angeles area ocean science education programs with information about the southern California marine environment and the Sanctuary by participating in the Centers for Ocean Science Education Excellence West (COSEE-West).

Activities (3)

(1) Place Channel Islands Harbor Boating Instruction and Safety Center Exhibits, Interpretation Panels and Literature Units. CINMS will work with the CIHBISC on a strategic plan that will include the designing and placing of exhibits, interpretation panels and portable literature distribution units. Sanctuary exhibits, interpretation panels and literature units will be in place by the opening of the CIHBISC.

Status: Planning assistance since 2001; to be completed in 2008-2009

Partners: Channel Islands Harbor, County of Ventura, California State University at Channel Islands and NGO's

(2) Implement Outreach Plans and Volunteer Programs. The best and most immediate vehicle for CINMS southern office outreach efforts is through the CIHBISC. The Center's programming will include not only boating instruction and safety, but marine biology, ecology, and oceanography. Programs will include both K-12 students and college-level programs administered by California State University-Channel Islands, two local community colleges and continuing education programs. CINMS will play a major role in providing a Sanctuary orientation and an ocean conservation ethic through educational programming at the CIHBISC. The successful "Oceans to Classrooms" program will be expanded to Ventura County, and will include partnerships with local operators, Island Packers, California State University Channel Islands, Channel Islands Marine Resource Institute, and the Ventura County Harbor Department.

CINMS is working with the CIHBISC on a strategic plan for a boating and waterways education program, program curriculum, exhibitory, a dockside touch-tank and water-based education activities such as a floating lab. Team OCEAN (Sanctuary Marine Watch), Channel Islands Naturalist Corps, and other volunteer opportunities will be available through the Ventura County Regional Office. A Sanctuary

interactive kiosk with up-to-date NOAA weather reports and Sanctuary interpretive panels and information will be placed on the dock in front of the Center. Once regional needs have been evaluated, interpretive signage, partnerships, additional Sanctuary interactive kiosks, and outreach programs will be put in place throughout the county.

Status: program planning began in 2001; implementation will occur across years 1-5

Partners: Ventura County Schools; UC Santa Barbara; Island Packers; Channel Islands Marine Resource Institute; Channel Islands Marine Floating Laboratory Program

(3) Implement COSEE-West Programs. In 2001, the National Science Foundation (NSF) funded the development of the Centers for Ocean Science Education Excellence (COSEE) in order to promote ocean education as an interdisciplinary tool for improving science education in the 21st century. Funding is used to foster communication and coordination among ocean science education programs nationwide and to promote partnerships between ocean science researchers and educators. COSEE-West is one of seven centers that was awarded funding by NSF and its partners including the University of Southern California, the University of California Los Angeles and the Los Angeles Unified School District (LAUSD). The LAUSD is the nation's second largest public school district with 677 schools and 270 science centers. There are over 1 million students enrolled in LAUSD and the population is composed largely of immigrant and English-limited students. CINMS is a member of the COSEE-West Education Advisory Committee and assists in coordinating the LiMPETS (see AU.1, activity 5) program in Los Angeles County, teacher workshops and lectures, and creating classroom linkages to the southern California marine environment and the Sanctuary.

Status: Began in 2001, program development continues in years 1-5

Partners: UCLA Institute of the Environment, USC Sea Grant and Wrigley Institute, Los Angeles Unified School District, Los Angeles County Museum of Natural History, Aquarium of the Pacific, California Science Center, Cabrillo Marine Aquarium, UCLA Discovery Center

STRATEGY AU.6 – DEVELOPING EDUCATION & OUTREACH TOOLS & PRODUCTS

- *Objective:* To provide Sanctuary information to a widely diverse audience.
- *Implementation:* Education and Outreach staff

Background

CINMS produces a variety of educational tools and products to help reach targeted and general audiences through our education and outreach program(s). CINMS educational products enable CINMS to provide information to a diverse audience including divers, boaters, commercial fishers, teachers, students and the general public. They are distributed through a variety of venues including conferences, outreach and community events, teacher workshops, presentations, media packets, and in the field by volunteers, enforcement agencies, and other agencies co-managing the waters around the Channel Islands. Educational products play a vital role in raising awareness and knowledge about Sanctuary resources and regulations. These products also help to build stewardship for the Sanctuary. In addition to outreach products, the Sanctuary's educational cruises, web site, interactive kiosks, and outreach events are valuable tools for educating the public about Sanctuary resources.

Activities (5)

(1) Maintain Various Print Publications. Following is a list of current CINMS brochures, posters, or publications that will be updated, as appropriate, and restocked as needed.

Marine Mammal Guide

A concise and comprehensive waterproof field guide developed in cooperation with the Olympic Coast, Cordell Bank, Gulf of the Farallones, Monterey Bay, and Hawaiian Islands Humpback Whale NMS's.

Alokooy

A nationally distributed annual newsletter, produced jointly by CINMS and the California Marine Sanctuaries Foundation; offers highlights into current Sanctuary and regional issues, research and education programs. This publication also serves as an annual report.

Annual Research Report

An overview of the year's research activities in and around the Sanctuary. A useful information piece for both scientists and the layperson.

Boater Safety Tips Brochure

A brochure including information related to boating safety, regulations on discharge in the ocean and Sanctuary, clean boating practices, and local marine refuse stations. This publication is a partnership effort among CINMS, CINP, Ventura Power Squadron, County of Ventura, and CDFG.

Protecting Our Seabirds

A bilingual (Spanish and English) brochure targeting pier and jetty fishermen, kayakers, and boaters. The brochure includes: general information about reducing impacts to seabirds, tips while fishing and boating, and seabird viewing guidelines. Hotline information is included to report injured or entangled seabirds.

Things to Do

A brochure with activities for visitors, providing contact information on nearby harbors. Includes information on pinnipeds, whales, dolphins, and sharks

Protecting Your Channel Islands

A brochure describing the Channel Islands MPA network provides information about different jurisdictions protecting resources of the Channel Islands, and highlights locations for activities such as diving, camping, and anchoring. This brochure has been translated into Spanish.

Common Fishes of the CINMS

Includes images of fish commonly seen in both the Channel Islands and Monterey Bay NMS's. A good underwater reference for divers and snorkelers.

Sharks of The Channel

A full-color poster with images of the seven most common sharks in the Sanctuary.

Channel Islands Aerial View

A full-color poster of an aerial photograph showing the four northern Channel Islands from the perspective of Anacapa Island looking west.

3D Bathymetric Map

A poster featuring a GIS-based, three-dimensional perspective map of CINMS.

Chumash Tomol Poster

A poster highlighting the importance of the living Chumash Native American culture to the Santa Barbara Channel region and CINMS. The poster, designed by the Chumash Maritime Association and produced by CINMS, has a Chumash story on the back and an interpretation of some of the important elements and symbols of traditional Chumash culture used in the poster design.

Channel Islands Marine Reserves...Wild for the Future Poster

A two-sided, full color educational poster with beautiful photographs of marine life and recreational activities that occur in the Channel Islands MPA network, as well as maps showing MPA locations, and key species and habitats found in the MPAs. Also included are classroom ideas for K-12 teachers.

Status: Ongoing since mid-1990s; annual updates to products as needed

Partners: Channel Islands National Park, California Department of Fish and Game, and Chumash Maritime Association, SET (Sanctuary Education Team, which is a working group of the Sanctuary Advisory Council), and others

(2) Support Various Other Educational Materials. The following is a list of current and future classroom and educational materials developed and to be maintained by CINMS.

Channel Islands Naturalist Corps Training Manual

A training and reference manual for CINC volunteers containing information on the biology, distribution and natural history of marine life found within the Sanctuary; oceanography of the Channel; historical resources; Sanctuary regulations and Sanctuary research and monitoring programs. (See Strategy AU.3)

Mountains to Sea Educational Material

For grades 4–8. Developed by the Youth Education Committee of Project Clean Water. Project Clean Water is a unified community effort to clean up Santa Barbara County’s creeks and beaches with members from the City and County of Santa Barbara and local organizations. (See Strategy AU.1)

Team OCEAN: Sanctuary Marine Watch Classroom Educational Material

Educational material to be developed/updated for prospective Sanctuary Marine Watch volunteers containing information on marine protected areas, biodiversity and marine conservation, marine habitats and living resources, potential impacts of recreational activities, and Sanctuary management responsibilities and regulations. (See Strategy AU.3)

Mapping an Ocean Sanctuary Classroom Educational Material

A curriculum guide using ArcView software to explore maps and databases showing biological, geological and economic features of the Channel Islands National Marine Sanctuary. Some specific topics covered in the Mapping an Ocean Sanctuary curriculum include storm water pollution, environmental monitoring, sea surface temperature effects on fish distribution and marine protected areas.

Status: Above pre-existing education materials developed from 1998-2002 and updated periodically; existing materials to be updated and maintained throughout years 1-5 as appropriate; Team OCEAN materials to be updated by year 3

Partners: Numerous partners including, Center for Image Processing in Education, Project Cleanwater, SET (Sanctuary Education Team - a working group of the Sanctuary Advisory Council)

(3) Support Other Outreach Materials. The following is a list of outreach materials developed and to be maintained by CINMS.

CINMS Slide Library

Contains thousands of images of regional marine resources taken by local photographers, researchers and Sanctuary staff. This extensive image inventory is used to develop Sanctuary educational products, to support web content, and for Sanctuary publications.

Exploring the Channel Islands National Marine Sanctuary DVD

An interactive overview of the geography of the Channel Islands, three-dimensional Island fly-bys, information on marine life of the Channel and Sanctuary programs. DVD is compatible with both Macintosh and Windows operating systems.

Encyclopedia of the Sanctuary

An online interactive reference guide to over 100 species of mammals, fishes, birds, invertebrates, and plants found in CINMS. Produced in cooperation with The Ocean Channel/Ocean.Com and the National Marine Sanctuary Foundation.

Sanctuary Interactive Kiosk

Provides real-time weather data twenty-four hours per day for mariners, fishers, divers and other Sanctuary user groups through an interactive computer touch-screen. Weather component of the kiosk is available on the CINMS Website. Additional Sanctuary interactive kiosks are slated for installation at locations convenient for Sanctuary recreational and commercial user groups (see Strategy AU.4)

Website

Up-to-date information regarding education, research, cultural resources and resource protection, Advisory Council, other public events and meetings Sanctuary curriculum, research data, Internet workshops, distance learning and chat sessions (see Strategy AU.4).

Signage and Interpretation Panels

Sanctuary educational signs and interpretation panels are currently posted at: 1) City of Santa Barbara Shoreline Park; 2) Ventura Pier; 3) Outdoors Santa Barbara Visitor Center; 4) Channel Islands National Park Visitor Center; 5) Santa Barbara Museum of Natural History Ty Warner Sea Center; 6) South Coast Watershed Resource Center; and 7) Cabrillo High School Aquarium. Future locations include: 1) Santa Barbara Zoo (in Spanish and English); 2) Santa Barbara Harbor; 3) Ventura Harbor; 4) Channel Islands Harbor; 5) Channel Islands Boating Instruction and Safety Center; 6) Channel Islands National Park (Santa Barbara, Anacapa, Santa Cruz, Santa Rosa, San Miguel); 7) University of California Santa Barbara Outreach Center for Teaching Ocean Science; and 8) California State Parks (El Capitan and Refugio).

3D Bathymetric Terrain Model

GIS-based, three dimensional perspective model of CINMS that is located in the CINMS Ventura County Field Office in an area that is frequented by visitors.

Living Journal

Accessed through the CINMS Website, the Living Journal provides a firsthand perspective on local and national projects and events.

CINMS Media B-Roll

CINMS maintains current b-roll footage of Sanctuary living resources; maritime heritage resources; and resource protection, research, and education programs in a format compatible for television media.

CINMS High Definition Film

The Sanctuary is working with NOAA's National Ocean Service Media Center to create a 20-26 minute high definition film and 1-2 minute video trailer. This film will take viewers on a tour of the Sanctuary and education them about the unique ocean ecosystem of the Channel Islands. Ocean literacy will be enhanced by examining the interconnectivity of land and sea.

Status: Most of the above-listed outreach materials developed and updated from 2000-2004; updates to continue through years 1-5, as appropriate. The CINMS High definition film is expected to be complete in 2008

Partners: Numerous partners including Green Meadow Entertainment, The Ocean Channel and others

(4) Sponsor Sanctuary Cruises. Each year the Sanctuary sponsors a variety of public educational cruises aboard different vessels. These cruises include kayaking, diving and wildlife viewing and are targeted toward varying audiences including local residents, tourists, teachers, students, and community groups. Sanctuary staff and volunteers facilitate hands-on activities such as oceanography experiments, fish identification, marine mammal and seabird identification, fish surveys, and wildlife viewing to encourage an understanding and stewardship for Sanctuary resources.

Status: Common practice since designation; will continue through years 1-5

Partners: Concessionaire vessels to the Channel Islands National Park, other commercial marine excursion vessel operators, and numerous other education partners

(5) Participate in Outreach Events. CINMS participates in over 35 outreach events each year including whale festivals, harbor festivals, boat shows, fishing conventions, dive industry events, county fairs, and science fairs. Attendance at these events varies from 60 to 6,000 per day. They represent a broad geographic area that includes Santa Barbara County, Ventura County, and Los Angeles County. Presence at these community outreach events provides CINMS an opportunity to exhibit images of Sanctuary resources, distribute educational products, provide hands-on activities related to Sanctuary programs, and encourage visitation to the Sanctuary with a broad audience interested in a variety of marine related activities such as ocean conservation, recreational boating, diving, and wildlife viewing. CINMS education staff participates on a variety of event planning committees to promote awareness of the Sanctuary.

Status: Ongoing activity since designation that has grown in scope; will continue throughout years 1-5

Partners: Numerous partners, Channel Islands National Park



Figure 33. Outreach products are widely disseminated throughout the Sanctuary community. (CINMS)

STRATEGY AU.7 – VISITOR CENTER SUPPORT & DEVELOPMENT

- *Objective:* To maximize the Sanctuary’s regional public exposure through the development of exhibits and programs at planned and developed marine and natural resource-based visitor centers.
- *Implementation:* Education and Outreach staff

Background

While CINMS does not currently maintain its own independent visitor or education center, it maintains exhibits at a variety of visitor centers and similar facilities operated by partner organizations. In 2003 Booz Allen Hamilton, a strategy, management and technology consulting firm, produced a Facilities Master Plan for CINMS adopted by the NMSP. The plan contains an assessment of and recommendations for pursuing various existing and potential new exhibit spaces, visitor centers, signage locations, an analysis of existing Sanctuary facilities, and a recommendation for expanding office space (see Strategy OP.7 for more information about office space expansion).

Over the next five years, the Sanctuary will complete implementation of a CINMS Master Facilities Plan to maximize CINMS’ regional public exposure through the development of exhibits and programs at planned and developed marine and natural resource-based visitor centers. These venues, which are represented in the activities of this strategy, provide an important opportunity to display, promote and interpret CINMS programs and products while enhancing and leveraging a variety of existing and new partnerships.

Activities (7)

(1) Partner with the Outdoors Santa Barbara Visitor Center. The Outdoors Santa Barbara Visitor Center is a unique partnership among four government agencies: 1) Channel Islands National Park; 2) Los Padres National Forest; 3) the City of Santa Barbara; 4) the Santa Barbara Maritime Museum; and 5) CINMS. Perched on the fourth floor of the Waterfront Center in the Santa Barbara Harbor, this center is completely staffed by a paid volunteer coordinator and volunteers. Through tile murals representing the Chumash *Rainbow Bridge* story, a computer station and a wayside exhibit featuring living and historical resources of the region, visitors are provided with opportunities to learn about the different ways each agency protects the resources. This interagency partnership also provides improved public service at a reduced cost by the sharing of resources to develop and operate this Center in the Santa Barbara Harbor. CINMS staff will continue to support the Center’s operations and ensure CINMS educational materials and displays are kept updated.

Status: The center opened in 2000; CINMS support for operations to continue throughout years 1-5

Partners: Channel Islands National Park, U.S. Forest Service, City of Santa Barbara; Santa Barbara Maritime Museum added as a partner in 2007

(2) Partner with the Santa Barbara Museum of Natural History's Ty Warner Sea Center. Over the last decade, the Santa Barbara Maritime Museum has partnered with the Sanctuary in the development and implementation of several highly successful projects. One such project is the Sea Center on Stearns Wharf in Santa Barbara. Over the years, the Sea Center evolved from a casual, walk-in visitor center into



Figure 34. The Santa Barbara Museum of Natural History Ty Warner Sea Center has undergone significant revitalization. (Joanne Calitri)

a community education resource center serving more than 70,000 visitors and 7,000 school children each year. The Sea Center was closed for the past few years for major renovations, and reopened its doors in 2005 as a dynamic new education center. The new Ty Warner Sea Center represents the leading edge of museum exhibit design and interactive experience, utilizing both technology and trained staff to create a fun, engaging, interactive visitor experience featuring: interactive exhibits designed to help visitors experience scientific discovery; opportunities to work like scientists, sampling and testing ocean water, studying animal behavior, and examining microscopic marine life; live tidepool animal encounters; a theater showcasing the wonders of the Santa Barbara Channel; and several exhibits on the CINMS,

including a touch screen Sanctuary interactive kiosk. CINMS has worked and will continue to work closely with the Ty Warner Sea Center to bring Sanctuary resources and programs to the public through use of Center's trained staff, cutting edge technology, planned school programs, and high level of public visitation.

Status: CINMS assistance with exhibit design from 2002-2004; center reopened in 2005; CINMS assistance with development of Sea Center Interactive Theater in 2005; support, maintenance and upgrade of CINMS exhibits and Center programs to continue over years 1-5

Partners: Santa Barbara Museum of Natural History Ty Warner Sea Center

(3) Maintain Exhibits for the Cabrillo High School Aquarium. The Cabrillo High School Aquarium is a newly renovated and expanded aquarium (managed by the students of Cabrillo High School), featuring a cold water reef and animals, touch tank and exhibit of living resources of CINMS. The CINMS has designed and developed interpretive exhibits (including a 3-dimensional model of the Sanctuary showing the depth contours around the Channel Islands) and a Sanctuary interactive kiosk displaying real-time weather conditions in and around the Sanctuary. These interactive exhibits educate visitors about the role and importance of the CINMS protecting the marine resources of the region. The CINMS will maintain these exhibits and continue to work with high school and aquarium staff to develop educational programs and products highlighting Sanctuary resources and technology tools.

Status: Design and installation of exhibits 2000-2003; maintenance and educational program develop to continue over years 1-5, as appropriate

Partners: Cabrillo High School

(4) Partner with the Channel Islands Harbor Boating Instruction and Safety Center (CIHBISC).

CINMS' presence is an integral part of the continued planned development of the CIHBISC (see AU.5, activity 1). CINMS staff will provide oversight in planning Sanctuary exhibits, education programs and an outside visitor center overlooking the Channel Islands. CINMS staff will also maintain a board member seat on the Channel Islands Harbor Foundation.

Status: Staff assistance with planning and development began in 2001; upon completion and opening of the Center, ongoing exhibit and education programming support to continue, as needed, throughout years 1-5

Partners: Ventura County Harbor Department, Channel Islands Harbor, Channel Islands Harbor Foundation, Channel Islands Harbor Boating Instruction and Safety Center

(5) Work with the South Coast Watershed Resource Center. This Center is a learning and educational resource facility aimed at enhancing public awareness of Santa Barbara County's watershed system. Program themes include watershed restoration and water quality, with an emphasis on helping visitors and the local community understand the connection between healthy watersheds and individual personal habits. CINMS has worked with the Center to install a nautical chart tile map of the Sanctuary and CINMS interpretive signage at the entrance to the building, and has contributed watershed-based educational curriculum to the Center. CINMS staff will continue to work with the center on educational programming and exhibits, and will look to the Center as a partner as steps are taken to develop a Sanctuary water quality program (see Strategy WQ.2 – Water Quality Protection Planning).

Status: Partnership activities since 2001, CINMS developed an interpretive sign at the entrance to the center and assisted with development of island tile mosaic to continue partnership as appropriate over years 1-5

Partners: Community Environmental Council and Art From Scrap

(6) Maintain and Improve CINMS Presence at Channel Islands National Park Visitor Center. CINMS will continue its ongoing partnership with the Channel Islands National Park Visitor Center in Ventura, which receives thousands of visitors each year. CINMS maintains an exhibit, provides brochures, and contributes to the reference library. CINMS will partner with the Channel Islands National Park Visitor Center to seek funds to develop a new interactive Sanctuary exhibit in the Center's lookout tower. The exhibit will highlight Sanctuary resources such as marine habitats and their associated species.

Status: Maintenance of CINMS presence in Visitors Center has been ongoing for several years. Initial planning for new Sanctuary exhibit began in 2003 and continues; implementation schedule dependent upon future capital facilities funding.

Partners: Channel Islands National Park

(7) Assist in Development of the Outreach Center for Teaching Ocean Sciences (OCTOS).

A 2003 CINMS Facilities Master Plan recommends NMSP investment in a proposed new facility at the University of California Santa Barbara (UCSB) as a best value option for securing additional office space while also enhancing exhibits and visitor center services. UCSB's Marine Science Institute (MSI) has for several years partnered and collaborated with CINMS on many research, monitoring and educational programs and projects. MSI approached CINMS in 2002 with the idea of constructing a state-of-the-art education center on campus at a site next to the MSI building that could also provide needed additional CINMS office space. From this initial idea UCSB took the lead on fundraising. In 2004 the NMSP provided some initial funding for preliminary design and feasibility work. Then, in fiscal year 2005, Congress awarded \$4 million to the project. An additional \$3 million was awarded by Congress in 2006. These funds are currently being applied toward development of a detailed design for the proposed

combined CINMS office space and Outreach Center for Teaching Ocean Sciences (OCTOS). Fundraising by UCSB and MSI will continue. CINMS would ultimately not own the new OCTOS/office space facility, but would enter into a long term lease with UCSB.

OCTOS is still in the design phase, but is expected to feature a variety educational opportunities that will enhance public understanding and appreciation of the marine environment and CINMS in particular, including: a seawater center with touch tanks that will provide hands-on learning experiences about marine life; a technology center that will offer interactive learning opportunities; a digital global projection sphere; a high-tech “Reality Theater” capable of supporting live, interactive telepresence communications around the world; video and microscope projection installations; and virtual reality environments.

CINMS and NMSP staff will continue to work jointly with UCSB-MSI on development of OCTOS, including Sanctuary-related exhibits and educational experiences. CINMS staff will continue to play a leading role in OCTOS design work, including serving as co-chair the UCSB’s project Building Committee and serving as a liaison to CINMS and NMSP staff involved in or affected by the project. CINMS staff will also assist with a variety of project oversight duties during the construction phase.

Status: Joint planning with UCSB/MSI in progress since 2003; CINMS design assistance through years 1-2; assistance with construction oversight in years 3-4; possible OCTOS opening in year 4 or 5

Partners: UCSB-Marine Science Institute

STRATEGY AU.8 – MPA NETWORK EDUCATION

- *Objective:* To raise awareness and understanding among the general public and Sanctuary users of the system of marine reserves and conservation areas within the Sanctuary.
- *Implementation:* Education and Outreach staff

Background

The Sanctuary contains a network of marine protected areas including ten marine reserves (no-take zones) and two conservation areas (limited-take zones), with the areas in state waters designated by the State of California, and the areas in federal waters designated by NOAA (see Figure 51 in the Resource Protection Action Plan, p. 180). Since 2002, the CINMS education programs and services have helped the general public and Sanctuary users understand what and where the marine reserves and conservation areas are, why they were established, and what can be learned from them. This strategy identifies MPA network education actions currently underway and how they will be maintained and enhanced over the five year horizon of this management plan.

Activities (5)

(1) Implement SET Recommendations for MPA Network Education and Outreach Products and Services. The Sanctuary Education Team (SET) is a working group of the Sanctuary Advisory Council established in January 2002 to advise and make recommendations on marine educational issues related to the Sanctuary. The SET conducted a needs assessment of Sanctuary user groups to determine the best messages and delivery mechanisms for development of MPA network educational programs and materials. In late 2002 the SET recommended and the Advisory Council endorsed a comprehensive suite of education strategies, programs and products to inform various sectors of the public about the Channel Islands MPA network (contained in a product referred to as the “SET marine reserves matrix”). Some of these SET recommendations have been implemented by CINMS staff, but much remains to be done and will continue to be developed and implemented over each of the five years of this management plan (and is reflected in many of the activities of this strategy). In 2004 and 2005 the SET focused on developing education and outreach presentations to support public education about the Channel Islands MPA network. Staff has assisted with that effort and will continue to support SET involvement in presentation design and delivery. In addition, wherever possible, MPA network components will be incorporated into existing Sanctuary education and outreach activities (such as those listed at AU.1, AU.2, AU.3 and AU.6).

Status: SET advice in 2002 and 2003; implementation to continue across years 1-5

Partners: Sanctuary Education Team, Advisory Council

(2) Develop Printed Educational Products. Printed educational products have been and will continue to be developed to raise awareness about the marine reserves and conservation areas. These include brochures, posters, maps, publications and other existing materials listed at AU.6 (activities 1 and 2), and will also involve new product development as needed and appropriate.

Status: CINMS MPA network-related printed products developed from 2002 through 2005, maintenance of supplies, update of materials, and development of new products, as appropriate, to continue through years 1-5

Partners: California Department of Fish and Game, Sanctuary Education Team, Channel Islands National Park

(3) Conduct Sanctuary Cruises. Sanctuary Cruises have and will continue to be conducted as educational field trips to the Sanctuary, including visits to MPA network sites (four times per year).

Status: Occasional MPA network cruises have taken place from 2003-2005; additional cruises (at least 4 per year) to be implemented throughout years 1-5

Partners: California Department of Fish and Game, Channel Islands National Park, and numerous other potential partners

(4) As Part of the California National Marine Sanctuaries Signage Plan, Develop, Place and Maintain Interpretive Signs and Kiosks. CINMS will develop, place and maintain marine MPA network signage at various Sanctuary departure points, including the Channel Islands. Sanctuary Education Team recommendations (provided in 2002) will help guide placement. Signs will provide basic information about the CINMS, including the purpose, location, resources and regulations for the MPA network. At local ports and harbors, upgrade and maintain CINMS touch-screen interactive kiosk system to include information about the MPA network.

Status: Signage implementation began in 2003-2004, and will ramp up through years 1-2; upgraded signage to follow depicting the full MPA network completed in 2007

Partners: CA Department of Fish and Game, Channel Islands National Park, Sanctuary Education Team

(5) Maintain MPA Network Website. Maintain and enhance a comprehensive public information center on the Channel Islands MPA network through the Sanctuary's website.

Status: MPA network web site began in 1999 and has evolved considerably since then; continued enhancements to occur over years 1-5

Partners: CA Department of Fish and game, Sanctuary Education Team

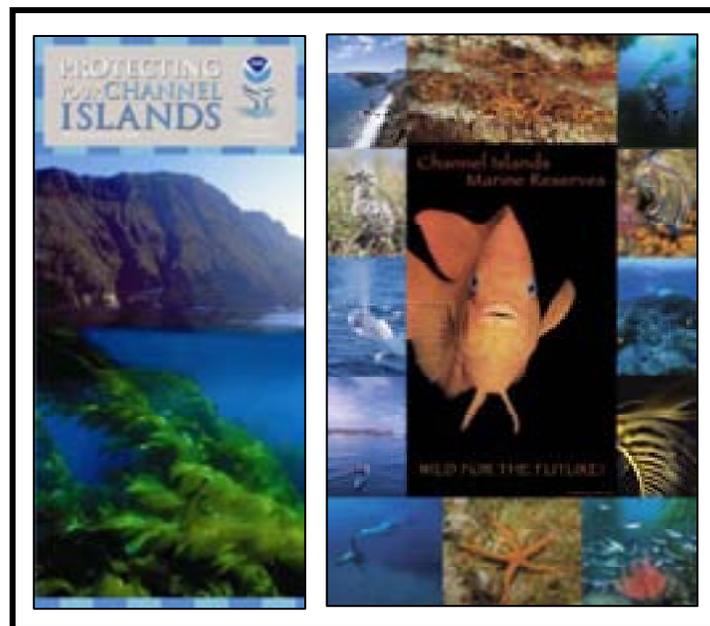


Figure 35. Marine Protected Area (MPA) network outreach products

STRATEGY AU.9 – MULTICULTURAL EDUCATION

- *Objective:* To build Sanctuary stewardship and increase understanding of ocean related threats within the Hispanic communities of Santa Barbara and Ventura counties.
- *Implementation:* Education and Outreach staff

Background

According to the U.S. Census Bureau (2000a) approximately 34% of the population in Santa Barbara and Ventura counties is Hispanic (also known as Latino) and in California 33% of the population is Hispanic. However, community participation in CINMS programs and services did not represent the demographic composition of the region according to the public scoping findings for the Sanctuary's management plan. CINMS strives to foster increased community participation in resource protection. Toward that end, CINMS conducted a thorough needs assessment for multicultural marine education and outreach in 2004-2005. Utilizing the findings of the needs assessment study, a Multicultural Education for Resource Issues Threatening Oceans (MERITO) program logic model was designed that allowed Sanctuary staff to determine and measure the program's short and long-term outcomes, foresee the required resources, and plan the activities required for achieving the program's goals and objectives.

Although CINMS has not historically followed an official multicultural education plan, the Sanctuary does have a history of success in working with local education partners to create K-12 educational programming for Latino students in Santa Barbara County. In 1987, the Sanctuary funded the development of an integrated marine science program called "*Los Marineros*" for 5th grade students in Santa Barbara County Schools. Administered by the Santa Barbara Museum of Natural History until 2005, the program served over 1000 students annually, with over 70% of the students representing the Latino community.

The NMSP supports using the Monterey Bay National Marine Sanctuary's (MBNMS) Multicultural Education Plan as a model for other national marine sanctuaries across the nation. Based on the findings of the 2004-2005 needs assessment and on the success of the MBNMS Multicultural Education for Resource Issues Threatening Oceans (MERITO) program, CINMS developed its own multicultural education plan to provide expanded bilingual outreach and education about marine and coastal environments and their conservation to students, teachers, adults, and families. The proposed education programs, include education and outreach strategies, media campaigns, materials, and products which address how families can protect coastal watershed areas, how they can take action in their own lives to protect the ocean, and why ocean protection is a role all coastal citizens share.

Activities (3)

(1) Retain Bilingual Community Liaison. CINMS hired a bilingual community liaison in 2004 to conduct and coordinate the needs assessment survey and analysis. Since that time, this position has been retained through a combination of the Sanctuary budget and grant funding. CINMS will continue to take steps to retain this position and solidify its base funding in order to support implementation of the multicultural education program.

Status: Liaison hired in 2004; CINMS to retain services through years 1-5

Partners: Internal

(2) Develop and Adapt Multi-Cultural Elements to CINMS Programs and Materials. CINMS will build multicultural elements into existing CINMS education and outreach programs that will be selected and

prioritized based on the strategic plan developed from the needs assessment survey and workshop and the MERITO strategic plan.

MERITO Academy (K-12 and after school)

The Sanctuary is developing and implementing programming for Hispanic youth (4th-8th grade level) to increase awareness about CINMS within the Hispanic community. For example, the incorporation of the CINMS Argonauts program into the MERITO Academy program. The MERITO Academy consists of training Hispanic serving teachers to utilize the state aligned Sanctuary curriculum, and year round support to the teachers in the class and during the related field activities which are designed to raise stewardship for the Sanctuary and for ocean protection.

Adult Education Programs (see AU.2 activity 2)

CINMS staff will develop a lecture/field trip about the Sanctuary and present it in English as a second language (ESL) classes. Santa Barbara City College, Ventura College, and Oxnard Adult Education School each offer ESL classes. Also part of the MERITO strategic plan is the development of Sanctuary and marine education content for ESL adult student curriculum and a lecture/field trip about the Sanctuary for presentation at English as a Second Language (ESL) classes.

Other strategies include:

- Bilingual media campaign;
- Bilingual outreach materials;
- Internship opportunities for bilingual graduate and undergraduate students; and
- Participation of CINMS staff at Hispanic community events

Status: To be conducted from years 2 through 5

Partners: MBNMS, SET, Boys and Girls Clubs of Santa Barbara and Ventura Counties, California Department of Education-Migrant Education, California State Parks, California State University at Channel Islands, Casa de La Raza, Channel Islands National Park, Generation Communications (Ojai Valley Youth Foundation), Girls Inc. in Santa Barbara and Carpinteria, Girl Scouts of America, Golden State Environmental Education Consortium, Guadalupe Dune Center, Los Angeles Unified School District, UCSB chapter of Movimiento Estudiantil Chicano de Aztlan (MEChA or the Chicano Student Movement of Aztlan), Oxnard City College, Santa Barbara City College, Santa Barbara Hispanic Chamber of Commerce, Santa Barbara Maritime Museum, Santa Barbara Museum of Natural History, Santa Barbara Office of Education, Santa Barbara SEA, Society of Advancement of Chicanos and Native Americans in Science, Splash the Trash, UC Cooperative Extension (Agua Pura Leadership Institute), UC Santa Barbara/Marine Science Institute, UCSB Latino fraternities and sorority organizations and Latino service organizations, Ventura Community College, Ventura Superintendent of Schools office, Ventura Unified School District, adult education schools offering ESL classes

(3) Implement the Multicultural Education Strategic Plan. Based on common themes and programs/products generated from the needs assessment and workshop, and developed into a strategic plan, CINMS has begun implementing the multicultural education strategic plan in Santa Barbara and Ventura County communities.

The CINMS MERITO Strategic Plan includes education and outreach strategies to be implemented within a five-year time-frame in collaboration with community partners. The plan is geared toward reaching sub-audiences within the Hispanic community such as youth, teachers, Spanish speaking adults, migrant families, community leaders and representatives of the agriculture and restaurant industries. The program

focuses primarily on fostering Sanctuary stewardship, increasing knowledge of ocean related threats such as water quality, over fishing and global warming, while promoting environmentally responsible living. Main themes of the MERITO Strategic Plan include:

- *Community Based Bilingual Outreach Program.* Serving Hispanic students (middle school level), adults, migrant families, community leaders and agriculture and tourism representatives.
- *Teacher Training and Hispanic Students Internship Program.* Address teacher professional development opportunities for Hispanic-serving teachers and youth program educators on marine sciences and resource protection and the need for paid internship opportunities for Hispanic graduate and undergraduate level students.
- *Bilingual Outreach Program.* To increase visitation to the Channel Islands and outreach centers (such as park visitors-centers, museums and aquariums), and collaboratively provide comprehensible natural resource protection information.
- *Communications Plan.* Targeting at a larger scale all age levels of the Hispanic audience through a comprehensive media campaign and communication tools in collaboration with partner organizations.
- *Bilingual Outreach Products and Materials.* Produce bilingual products conveying Sanctuary related information, watershed and ocean connections and promote environmentally friendly practices.

Status: Initiated in 2006, ongoing thereafter

Partners: MBNMS, SET and potentially many others, including: Channel Islands National Park, Ventura County Superintendent of Schools Office, Santa Barbara County School District, UCSB Marine Sciences Institute, Santa Barbara Maritime Museum, Boys and Girls Clubs of Oxnard, Ventura and Santa Barbara, UC Cooperative Extension LA and Santa Barbara County, Santa Barbara Museum of Natural History – Ty Warner Sea Center, Clear Channel Broadcast, Oxnard City, Santa Barbara County Water Agency, Santa Barbara City Creeks Outreach Division, El Consilio, Future Leaders of America, Oxnard Network Coalition, El Centrito de la Colonia, La Casa de la Raza, CAUSE, Head Start, Oxnard College, Santa Barbara Community College, Ventura College, Migrant Education Offices of Ventura and Santa Barbara, UC Channel Islands, Ojai Valley Youth Foundation, Ocean Futures Society, Heal the Ocean, Environmental Defense Center, Community Environmental Council. Island Packers, Truth Aquatics, Aquarium of the Pacific, California Department of Parks and Recreation Ventura County and Santa Barbara County

Table 4. Estimated Costs for the Public Awareness & Understanding Action Plan

Strategy	Estimated Annual Cost (in thousands)*					Total Estimated 5 Year Cost
	YR 1	YR 2	YR 3	YR 4	YR 5	
AU.1: Education Program Development	\$30	\$91.5	\$91.5	\$81.5	\$81.5	\$376
AU.2: Community Involvement	\$32	\$55	\$56	\$57	\$58	\$258
AU.3: Team OCEAN	\$38.5	\$26	\$24	\$24	\$24	\$136.5
AU.4: Developing Outreach Technology	\$52.5	\$99	\$99	\$56	\$56	\$362.5
AU.5: Greater Southern CA Outreach	\$0	\$40	\$45	\$50	\$30	\$165
AU.6: Education & Outreach Tools & Products	\$111.5	\$112.5	\$112.5	\$112.5	\$112.5	\$561.5
AU.7: Visitor Center Support & Development	\$20^	\$20^	\$60^	\$32^	\$27^	\$159
AU.8: MPA Network Education	\$49	\$16	\$16.5	\$17.5	\$18	\$117
AU.9: Multicultural Education	\$0	\$27**	\$30	\$35	\$40	\$132
Total Estimated Annual Cost	\$333.5	\$487	\$534.5	\$465.5	\$447	\$2267.5

* Cost estimates are for “programmatic” funds, which exclude base budget funding requirements (salaries, overhead, etc.).

** Contributions from outside funding sources also anticipated.

^ Additional funding will come from NMSP Capital Facilities allocations.

Addressing the Issues – Strategies From Other Action Plans

In addition to the strategies identified in this Public Awareness & Understanding Action Plan, there are several strategies from other action plans either directly or indirectly addressing the issue of increasing public awareness and understanding of the Sanctuary and its resources:

- CS.2 – Comprehensive Data Management;
- CS.5 – Research Interpretation;
- MH.2 – MHR Volunteer Program;
- MH.3 – Partnering With the Santa Barbara Maritime Museum;
- MH.4 – Implementing a Coordinated MHR Protection Outreach Effort;
- MH.5 – Upgrading the Maritime Heritage Website;
- MH.6 – Supporting Public Education of Chumash Native American Maritime Heritage;
- EE.2 – Expanding Enforcement Efforts; and
- OP.1 – Sanctuary Advisory Council Operations

Addressing the Issues – Regulations

Not applicable. Education and outreach are important tools used to assist with increasing compliance with Sanctuary regulations. Sanctuary regulations are available at 15 CFR 922.70-922.74.

CONSERVATION SCIENCE ACTION PLAN

Overview

CINMS staff prioritized conservation science as one of the Sanctuary's primary programmatic functions. This function is driven by the NMSA, which states that the purpose and policy of the NMSA is "to support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas" (16 U.S.C. 1431(b)(5)). The mission of the National Marine Sanctuary Program (NMSP) is "to serve as trustee for the nation's marine protected areas to conserve, protect and enhance the biodiversity, ecological integrity, and cultural legacy of these ecosystems." Accomplishing this mission requires a rigorous, objective, scientific foundation for understanding ecosystem structure and function, evaluating the status of Sanctuary resources, understanding socioeconomic impacts, and implementing effective, sustainable, and adaptive management strategies (Gittings *et al.* 2003). CINMS research and monitoring efforts focus on the development and application of a program to support this scientific foundation. The purpose of the research department at CINMS is to support management decision making with conservation science. Site staff and their partners work to better understand such issues as:

- How do biological communities function and vary naturally?
- How do different biological components interact and how are they integral to the health of the ecosystem?
- What are the effects of human activities on the natural system?
- How do ecosystems vary over time due to natural perturbations and anthropogenic factors?
- What socioeconomic impacts result from the health of the ecosystem or from management actions?

Answering these questions allows CINMS to better understand Sanctuary ecosystems, the effects of human use impacts on Sanctuary resources, and the socioeconomic effects of Sanctuary management.

The Sanctuary engages in research mainly through partnerships with government agencies, universities, and private and non-profit institutions. CINMS provides vessel time, staff and field help, divers, and funding to projects that are compatible with the Sanctuary mission.

Description of the Issues

During the 1999 scoping meetings, a number of specific issues emerged in association with the general issue of science. Several of these specific issues were then designated by CINMS staff and the Advisory Council as areas the Sanctuary should address in the draft management plan:

- The Sanctuary should implement and support more research projects and opportunities;
- The Sanctuary should better interpret and summarize research findings for decision makers and public understanding;
- The Sanctuary should coordinate and cooperate with other regional science organizations;
- The Sanctuary should work to characterize and inventory Sanctuary species and habitat types, assess ecosystem health, and examine natural fluctuations vs. human impacts;
- The Sanctuary should include the participation of commercial fishermen in its scientific research projects; and
- The Sanctuary should always try to base decision-making on scientific information.

Conservation science will be applied at CINMS to help management better understand potential threats to Sanctuary resources. A summary list of management issues, many of which are described in the Resource Protection Action Plan, will be informed by the variety of research, monitoring, and evaluation work embodied in the Conservation Action Plan. These issues include:

- Spatial human use patterns;
- Introduced species;
- Anthropogenic noise;
- Aquaculture;
- Energy development;
- Artificial reefs;
- Climate change effects;
- Marine mammal ship strikes;
- Water quality;
- Efficacy of marine reserves and conservation areas; and
- Socioeconomic effects of marine reserves and conservation areas.

Addressing the Issues – Strategies For This Action Plan

Currently, CINMS is building a research program that complements the NMSP's national research priorities by focusing its data collection efforts in the areas of ecosystem assessment, monitoring, and processes. Continuing development of research projects in these three areas will help CINMS continue to



Figure 36. Sonar equipment is frequently used to map the seafloor (CINMS)

build strong foundations of sound science on which to base management decisions. These foundations also allow CINMS to identify gaps in knowledge about the resources to better identify future research needs and to address increasingly complex resource management issues. This information will be used to develop new strategies to protect Sanctuary resources, restore impaired ecosystem

structure and functioning, and mitigate threats to ecosystem health.

Three types of research projects provide information for CINMS management:

1. Intramural research projects funded by the NMSP and conducted by CINMS staff;
2. Extramural research projects funded and conducted by outside agencies and institutions; and
3. Directed research projects carried out by outside agencies and institutions with guidance and/or support from CINMS and NMSP headquarters.

In addition to data collection efforts, CINMS has a lead role in the community to identify research needs; to collaborate and coordinate research efforts between agencies and institutions; to analyze and disseminate data; and to identify practical management applications for existing data.

There are eight non-regulatory management strategies in this Conservation Science (CS) action plan:

- CS.1 – Sanctuary Aerial Monitoring and Spatial Analysis Program;
- CS.2 – Comprehensive Data Management;
- CS.3 – Support Monitoring and Site Characterization Programs;
- CS.4 – Collaborative Marine Research Project;
- CS.5 – Research Interpretation;
- CS.6 – Biological Monitoring of MPA Network;
- CS.7 – Socioeconomic Monitoring of MPA Network; and
- CS.8 – Automated Identification System (AIS) Vessel Tracking

Each of these strategies is detailed below.

STRATEGY CS.1 – SANCTUARY AERIAL MONITORING AND SPATIAL ANALYSIS PROGRAM (SAMSAP)

- *Objective:* To analyze historical data and create predictive models for resource management through near real-time data collection.
- *Implementation:* Research and Monitoring staff

Background

SAMSAP is an aerial survey program the Sanctuary utilizes for vessel traffic monitoring, marine mammal sighting, and emergency response. These efforts help address management questions about who is using the Sanctuary and how, as well as about the distribution, abundance, and types of marine mammals using the Sanctuary. Sanctuary staff conduct SAMSAP surveys aboard survey aircraft, flying along survey transects that traverse the Sanctuary from Santa Barbara Island to San Miguel Island. During the surveys a specially trained observer notes the location and types of vessels and marine mammals they observe, while a recorder enters this data into a computer system using specially designed SAMSAP software. SAMSAP allows near real-time collection and viewing of data vital to Sanctuary management and resource protection. CINMS will continue mission flights to maintain a statistically significant database to better analyze historical data and create predictive models for resource management. Data are shared with research partners and summaries are made available to the public using the CINMS comprehensive data management strategy.

Activities (2)

(1) Continue SAMSAP Data Collection. To collect statistically reliable data on vessel traffic and marine mammal sightings, aerial surveys need to take place on a weekly basis. A basic survey mission (vessel or marine mammal survey) consists of a recorder entering specific coordinates and species or vessel type specific information into the survey program. After completion, the survey file is converted to GIS data, which are then classified and displayed over a base map. Other data layers, such as sea surface temperature, may be added to allow queries across data types. Data are comparatively analyzed with other sampled physical and anthropogenic phenomena to observe trends, correlations, and variations. Animations of historic data are created to aid in the visualization of visitor use and marine mammal migration patterns over variable time frames. In addition to the data collection efforts, SAMSAP is being used as a response tool for resource emergencies such as oil spills. Data collected on spill perimeter changes, spill trajectories, observed oil, and endangered animals can be downloaded in real-time directly from the aircraft to a portable GIS at Unified Command Centers to aid in both immediate response decisions and long-term impact analysis.

Status: Ongoing since 1998, will continue multiple flights per week as weather and aircraft readiness permits

Partners: NOAA Marine and Aviation Operations

(2) Produce Data and Trends Analysis. Data collected from the vessel traffic surveys will help assist the Sanctuary in understanding levels and types of visitor use (both recreational and commercial) taking place in Sanctuary waters. These data are essential for understanding visitor impacts on marine resources and making sound management decisions. Marine mammal data will provide valuable information on migration patterns to better understand seasonal use of Sanctuary waters by cetaceans and pinnipeds. Data will be made available to scientists and decision-makers for predictive modeling, and to the public for viewing.

Status: Data collection since 1998; SAMSAP data analysis ongoing
Partners: Internal only



Figure 37. *Using NOAA aircraft or contracted aircraft resources is integral to the SAMSAP program. (CINMS)*

STRATEGY CS.2 – COMPREHENSIVE DATA MANAGEMENT

- *Objective:* To integrate CINMS data into existing regional and national data management programs that will facilitate conservation science-based decision-making.
- *Implementation:* Research and Monitoring staff

Background

Combining CINMS' existing infrastructure capacity with regional and national partners, the Sanctuary will develop a strategy for integrating, processing, synthesizing and analyzing a large volume of Sanctuary data. This strategy will initially focus on spatial data; however, CINMS will work to incorporate data spanning the variety of Sanctuary programs. For example, the system may include ecological, management, and historical resource data, as well as data on education and outreach projects. To maximize the utility of such a strategy, CINMS will ensure that the distribution node provides an intuitive user interface. The interface will be web-based, and will be made available for practical

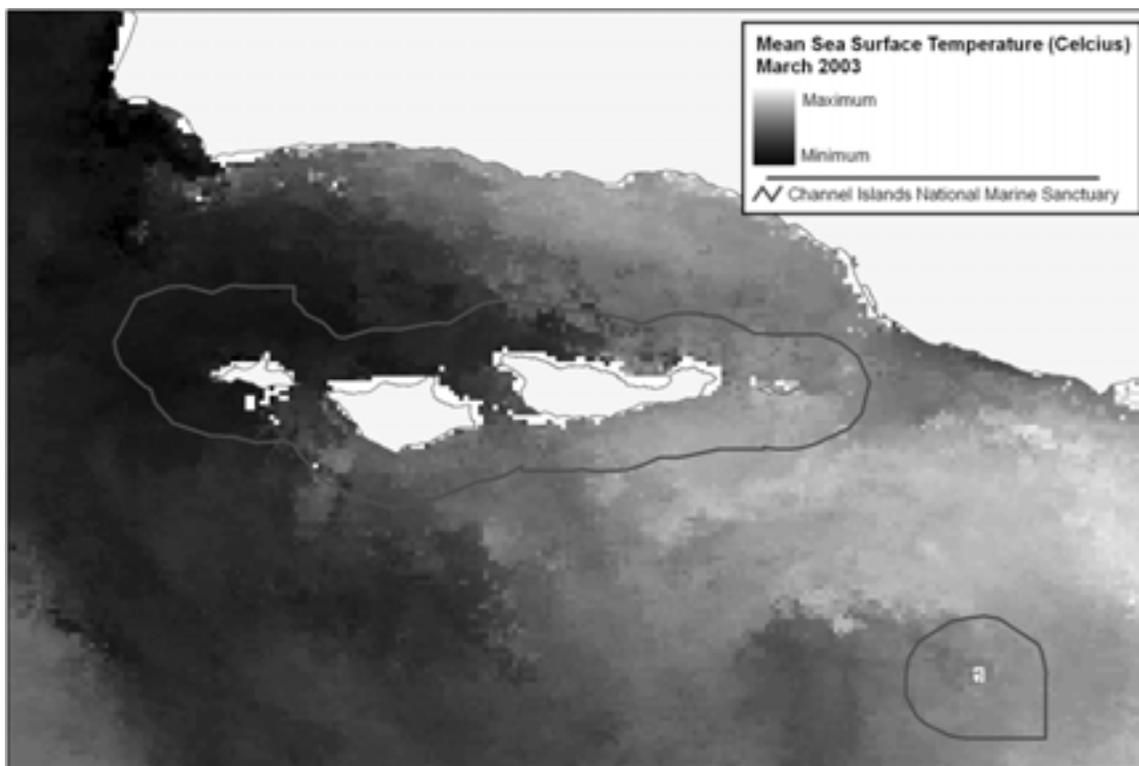


Figure 38. GIS imagery of CINMS

application by both a casual user and experts.

The objective of comprehensive data management is to develop a well-designed information management and dissemination tool to facilitate conservation science-based decision-making. Regional partners, such as the University of California, Santa Barbara's Marine Science Institute, have well developed infrastructure for such an endeavor (*e.g.*, "Marine Map"). Through data partnerships, CINMS will be able

to disseminate data using well established data distribution nodes. This will eliminate duplication of effort, save time and resources at CINMS, and support partners by providing the data useful to them and to the public. Additionally, CINMS will utilize the Sanctuary Integrated Monitoring (SIMoN) system to further provide easily accessible links to geospatial and other data created by CINMS. By collaborating with regional and national partners, CINMS will expand the range and uses of existing Sanctuary data.

Activities (2)

(1) Identify Applicable Data Nodes. CINMS will contact regional partners already running established web-based data warehouses and identify the appropriate data warehouses to best disseminate particular data types.

Status: Implement by year 2

Partners: SIMoN, NMSP Headquarters, UCSB

(2) Process and Maintain Existing and New Data. CINMS will continue current research programs involving data collection on natural and anthropogenic phenomena in the Sanctuary. CINMS will also ensure that data sets are kept up to date with current metadata. To enhance the resource management value of these programs, remotely-sensed satellite (*e.g.*, sea surface temperature), aerial (*i.e.*, SAMSAP), and habitat characterization (*e.g.*, sidescan sonar of benthic habitat) data will be integrated into existing and future research as well as current GIS programs to increase the Sanctuary's ability to carry out complex spatial analyses. All spatial data will be standardized according to National Spatial Data Infrastructure format.

Status: Ongoing

Partners: Internal only

STRATEGY CS.3 – SUPPORT MONITORING AND SITE CHARACTERIZATION PROGRAMS

- *Objective:* To support monitoring programs and build a database of Sanctuary resources.
- *Implementation:* Research and Monitoring staff

Background

CINMS will continue to work with and develop programs to understand habitats, species abundance, diversity, ecological processes, links with abiotic processes (*e.g.*, climate and physical oceanography), interactions with natural and human disturbance, and general resource protection issues. A baseline inventory is necessary to determine change over time; effectiveness of resource protection efforts; the effects of human activities on natural systems, and socioeconomic information on the use, scenic and existence value of resource conservation.

CINMS also strives to achieve a system-wide ecosystem monitoring program to track structural, functional, biological, chemical and physical conditions of natural marine resources over long periods of time to identify changes resulting from anthropogenic and/or natural disturbance. There are a variety of ecosystem monitoring efforts focused on important management issues, both current and emerging. Based on information from these monitoring programs, actions may be taken to address adverse impacts in order to more effectively conserve, enhance and restore habitats and ecosystems. Moreover, information from monitoring programs may indicate more effort is needed in assessing a particular aspect of the ecosystem. For example, several monitoring programs track disease and pollution, non-indigenous species, and bioprospecting as part of their regular monitoring activities. In this way, conservation science and evaluation of current and emerging issues are closely linked. As part of adaptive management, our research and monitoring program is ready to respond to current and emerging issues and changing priorities. Within the broad outline of this strategy, new research projects and partnerships may develop within the next five years in response to current and emerging issues or resource protection. Research priorities are evaluated on an annual basis.

Among these various monitoring efforts, the Sanctuary's role is to actively coordinate and support research efforts of other agencies and institutions, provide platform and personnel support for research conducted by CINMS and other agencies, and synthesize existing information to better identify data gaps and information needs. In addition, CINMS will work with partners to develop a methodology for intuitive data query to be used by resource managers (as well as educators and the public) through web-based access (see Strategy CS.2). The following site characterization and monitoring activities are "directed" research projects conducted by others with guidance and/or support from CINMS and NMSP headquarters

Activities (4)

(1) Continue Support for Monitoring. Monitoring of biological resources is needed to evaluate the condition of resources over time. Monitoring projects are regularly conducted efforts that revisit the same areas over time and use standardized protocols for the purpose of recording the status of a resource. CINMS supports several monitoring projects that evaluate habitat, species, and physical conditions. Several of these are listed below.

- Kelp Forest Monitoring – Since 1981, the NPS has monitored 16 sites in CINMS and Channel Islands National Park on a regular basis. These sixteen sites were selected to represent a range of biogeographical and physical settings of kelp forests in the CINP and CINMS. In 2004,

another 16 sites were added to pair sites inside and outside of state marine reserves for marine reserves monitoring. CINMS has provided vessel support for the program, and staff assist with CINP sampling schemes which include quadrants, band transects, random point contacts, visual fish transects, size frequency surveys, thermographs, video surveys, photogrammetric plots, and species inventory surveys. These data indicate temporal trends for 68 kelp forest taxa at 32 sites. Data also reveal differences in abundance of benthic organisms at different locations. This project is one of the longest ongoing data collection efforts in Sanctuary waters, providing data on one of the Sanctuary's unique and prolific habitats and CINMS is committed to supporting its continued operation.

Status: Kelp forest monitoring in continuous operation by CINP since 1981; Sanctuary support and involvement to continue through years 1-5, and beyond

Partners: Channel Islands National Park

- Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) – PISCO is a consortium of researchers at universities along the West Coast of the US. PISCO researchers at UCSB have been studying the Channel Islands since 1999. PISCO monitors fish and invertebrate density in kelp forest communities on SCUBA surveys inside and outside marine reserves. PISCO has three components: (1) subtidal monitoring (2) recruitment (3) oceanographic monitoring. The PISCO scientists collect data in a coordinated program that facilitates comparisons of marine biological communities and oceanographic conditions from Washington State to the southern border of California. Data is available online at:
<http://www.piscoweb.org/research/community/subtidal/sitemap#>.

Status: PISCO surveys and research conducted since 1999; Sanctuary support and involvement to continue through years 1-5, and beyond

Partners: PISCO

- Acoustic monitoring – Acoustic monitoring is conducted by Dr. John Hildebrand and his graduate students from Scripps Institution of Oceanography. The goals of their research program are to 1) understand the anthropogenic noise in the Santa Barbara Channel and Sanctuary using in-situ listening devices, 2) Relate the anthropogenic noise to ship traffic by integrating acoustic data with data on ship traffic from Automated Identification Systems on ships which is transmitted from large ships to various receivers including at Santa Barbara Harbor and UCSB, 3) understand the abundance, distribution, and vocalizations of marine mammals in the channel and Sanctuary, 4) understand how anthropogenic noise affects the behavior of marine mammals. Beginning in 2005, the scientists deployed equipment in the channel and in 2007 received additional funding for more equipment from NOAA. The Sanctuary assists by providing vessel time, field scientists, and community outreach. 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).

Status: Scripps researchers conducting research in the Santa Barbara Channel and Sanctuary since 2005; Sanctuary support and involvement to continue through years 1-5, and beyond

Partners: Scripps Institution of Oceanography, NOAA Ocean Acoustics Program

- Deep Water Monitoring – Following recommendations made in a 2005 workshop and the establishment of MPAs in federal waters in 2007, a proposal to characterize and monitor deep water habitat, communities, and populations was developed by West Coast sanctuary staff. The proposal calls for habitat mapping and characterization, and monitoring of biodiversity,

ecosystem health, invasive species, and other key species, identifying stressors, and understanding how extraction affects the ecosystem. Provided adequate resources can be obtained, a range of habitats and locations will be selected and monitored over time and will constitute a comprehensive survey of the community, including rare and common species. Activities in this proposal will allow the Sanctuary to leverage resources by incorporating ongoing projects, such as habitat mapping by USGS, while collaborating with partners on contemporary technologies such as submersibles, remote sense data, and technologically advanced diving methods. Further development of the proposal into an implemented plan is necessary (see Strategy CS.6). Given the significantly high cost of deep water monitoring, it will be important for CINMS and the NMSP to seek and leverage as much support as possible from other NOAA offices that are implementing potentially relevant projects. Proposed activities are inclusive of and complementary to CS.3, activity 4 (site characterization – see below) and CS.6 (Biological Monitoring of MPA Network).

Status: Workshop held in 2005, proposal development in 2008, plan implementation in years 2-5

Partners: NMSP Headquarters, USGS, NMFS, MBARI, EPA; Monterey Bay, Gulf of the Farallones, and Cordell Bank national marine sanctuaries

(2) Continue Seafloor Mapping Project. Since 1997, CINMS and the U.S. Geological Survey have conducted an ongoing survey to characterize benthic habitats in and around the waters of CINMS.³⁰ This research is designed to identify and link different habitat types and their associated biological communities. With NOAA vessels as launch platforms, side scan sonar has been and will continue to be used to ground truth sensor imagery of bottom types and bring a finer resolution to Sanctuary bathymetric maps. In addition, ROVs, submersibles, and cameras have been and will be used to ground truth the side scan sonar findings. With about 20 percent of the high-quality data mapping complete in Sanctuary waters, it is estimated it will take an additional 10 years to map the remainder. To complete seafloor mapping and site characterization of the CINMS, Sanctuary staff will continue to work closely with the U.S. Geological Survey, MMS, and other groups.

Status: Surveys ongoing since 1997; work planned to continue until mapping complete

Partners: U.S. Geological Survey and other experts

(3) Continue Support for Seabird Studies. Through nest searches, nocturnal spotlight surveys, captures, and other monitoring techniques, baseline seabird population data are being collected in the Sanctuary to obtain several measures of population status. These data will be used to compare future data to help measure changes in seabird populations. For example, since eradication of black rats on Anacapa Island in 2002, researchers have documented an increase in Xantus's murrelet nesting and nest success. CINMS supports seabird research, including Xantus's murrelets, Ashy Storm petrels, Cassin's auklets, and others using the CINMS vessel as a platform, and staff participation.

Status: Xantus's murrelet annual surveys ongoing since 2000 and planned to continue as needed, Ashy storm-petrels since 1995, CINMS support of Cassin's auklets since 2007

Partners: Humboldt state University; U.S. Geological Survey; Channel Islands National Park; Point Reyes Bird Observatory; U.S. Navy; U.S. Fish and Wildlife Service; American Trader Trustee Council (ATTC); CA Dept. of Fish and Game; Minerals Management Service, California Institute of Environmental Studies

³⁰ Much of the U.S. Geological Survey research within the Sanctuary has been funded by MMS.

(4) Support Site Characterization Research Projects. The Sanctuary supports projects to characterize features and resources of the Sanctuary. These include projects to characterize the physical features, kelp coverage, fish and invertebrates, and water quality, among others. As additional Sanctuary-based research proposals are received, CINMS will consider supporting select projects to assist in gaining a better understanding of living marine resources, ecosystems and human activities. As appropriate, CINMS will provide staff, vessel time or other support to these projects. Research priorities are evaluated on an annual basis, allowing for the inclusion of projects addressing emerging issues (see Strategy RP.2).

Status: Ongoing activity since site designation, support of select research projects to continue through years 1-5

Partners: Various researchers

(5) Develop a Carbon Budget for the Sanctuary. CINMS staff, with input from Sanctuary Advisory Council members, have developed a proposal for a pilot project to characterize the human carbon inputs to the Sanctuary. This pilot project is intended to be a component of a larger project to estimate a net carbon budget for the CINMS. This project will have a number of valuable dividends, but is principally designed to inform more environmentally responsible recreational, commercial and research use of the CINMS resource. Involved CINMS community members will deploy a fuel consumption and use monitoring program. Data from the Santa Barbara County Air Pollution Control District and California Air Resources Board will be collected to establish baseline reference levels and estimates of impacts for given levels of fuel consumption. CINMS staff will also analyze large ship data to predict large commercial CO₂, sulfur and nitrogen inputs to the CINMS domain. These values can be assembled to produce monthly estimates, which in turn may be used to develop quarterly and annual summaries that can be provided to the Sanctuary Advisory Council to monitor progress. In parallel, CINMS staff will work with the research community to develop other modules of the larger Carbon Budget for the CINMS into which the human impacts module will fit. The larger Carbon Budget will form the research framework onto which diverse current research can be integrated into larger-scale, ecosystem assessments.

Status: Development of proposal and pilot project in 2008

Partners: Sanctuary Advisory Council, various researchers and carbon budget experts

STRATEGY CS.4 – COLLABORATIVE MARINE RESEARCH PROJECT

- *Objective:* To foster research collaboration among scientists, various agencies and fishers and to obtain rigorous scientific data on issues of concern to these groups.
- *Implementation:* Research and Monitoring staff, Channel Islands Marine Sanctuary Foundation

Background

This strategy seeks to develop a program fostering collaboration among scientists, various agencies and fishers to promote cooperative research, resource assessment and protection with stakeholders who have experience and knowledge of the marine environment. The program is based on a partnership of local marine researchers, conservation organizations, commercial and recreational fishers and regional resource management agencies. It is designed to simultaneously collect resource management information in a cost-effective manner, build working relations between marine stakeholders and provide additional income to participating fishers.

Collaborative Marine Research Project partners will work together to prioritize resource management issues and questions and use these to select and design research projects. The data collected from these projects will help direct resource management efforts in the northern SCB. Efforts will be made to ensure this program does not duplicate existing research efforts, but rather complements them by filling research gaps and building new knowledge to assist resource managers in the decision making process.

Activities (1)

(1) Select and Implement Research Projects. A planning committee with representatives from participating agencies organizations and institutions will solicit research projects. The committee will also seek outside funding for additional program support. CINMS staff track progress and receive reports from projects.

Status: Pilot projects selected and funded in 2001/2002; two collaborative research projects were selected and funded in 2005 and conducted in 2006; Sanctuary support to continue through years 1-5 as funding allows

Partners: CA Dept. of Fish and Game; NOAA Fisheries; Channel Islands National Park; UC Santa Barbara; UC Sea Grant; commercial and recreational fishermen; The Ocean Conservancy; Channel Islands Marine Sanctuary Foundation

STRATEGY CS.5 – RESEARCH INTERPRETATION

- *Objective:* To communicate and interpret for the public, NOAA, the scientific community, and other resource managers, the research activities taking place in and around the Sanctuary.
- *Implementation:* Research and Monitoring, and Education and Outreach staff

Background

CINMS communicates and interprets for the public, NOAA, the scientific community, and other resource managers the research and monitoring activities taking place in and around Sanctuary waters. A successful interpretation and outreach program ensures an ongoing and open dialogue among scientists, managers and the public. Outreach leads to a better understanding of Sanctuary resources and their value and, ultimately, to more informed participation in resource management decision-making and ocean conservation. As an offshore site, CINMS needs to reach out to the regional community to make a connection between their activities on land and in and on the water and how this impacts the marine environment. Fundamental to this effort is helping the public learn about the value of the natural ecosystem, how human activities affect it and the connection between a healthy economy and a healthy ecosystem.

One model for successful monitoring program outreach is the Sanctuary Integrated Monitoring Network (SIMoN) system, a center for initiating and integrating data collecting efforts and for disseminating information (www.mbnms-simon.org). First implemented at the Monterey Bay National Marine Sanctuary in 2002, SIMoN uses a comprehensive website and database system to help researchers integrate existing monitoring programs and identify gaps in information. As a communication and data discovery tool, SIMoN helps the research community to avoid duplication of efforts so resources can be more effectively directed towards surveying and characterizing habitats, assessing the impact of natural processes or human activities on specific resources, and long-term monitoring. Through a web site, reports, newsletters and symposiums, SIMoN also serves to make monitoring data available to managers, decision makers, the research community, and the general public. The NMSP is seeking to expand SIMoN from the Monterey area to regions further north and south, specifically including the CINMS. Sanctuary staff plan to work closely with SIMoN staff and regional scientists to build and maintain SIMoN for CINMS.

Activities (4)

(1) Interpret and Disseminate Sanctuary Research Findings. CINMS works closely with the scientific community to distribute scientific information, identify information gaps, coordinate and disseminate data, and interpret research generated by the scientific community for public consumption. A key component of this activity will be the development and maintenance of a Sanctuary Integrated Monitoring Network (SIMoN), as described above, and similar to the system already in place at the Monterey Bay National Marine Sanctuary (www.sanctuariesimon.org). Another component is the continuation of an annual report summarizing CINMS research projects/results, as has been compiled by Sanctuary staff annually since 2004. The report will be disseminated in bilingual format as appropriate. Beginning in 2007, all sanctuaries will periodically produce a Sanctuary Wide Monitoring (SWiM) report that discusses the condition of the sanctuary. With input from experts, Sanctuary staff will produce the first CINMS SWiM report in year 1.

Status: CINMS research department web site offerings upgraded in 2003-2006. Since 2004, Sanctuary staff has assisted coordinating and supporting the Sanctuary Advisory Council's RAP (Research Activities Panel), which in part contributes to disseminating research and monitoring

program findings. Spatial information on projects was compiled in 2006 by UCSB Bren School intern. Research summary to be published annually. SWiM report to be published every five years.

Partners: Sanctuary Advisory Council, Research Activities Panel, UCSB, NOAA NMSP

(2) Develop a Research-Focused Website and Implement SIMoN. The website, to include SIMoN, will serve as a portal to various research and monitoring results, data, maps, publications and other materials for researchers and the public.

Status: CINMS research web site significantly upgraded in 2003-2006, maintenance and updated postings continue; SIMoN website developed by the end of year four

Partners: SIMoN, Internal

(3) Disseminate Research Information at Public Venues. CINMS will ensure public awareness of Sanctuary research by providing research information, such as that contained in the annual report mentioned in activity (1) above, at meetings, workshops, and lectures. These outreach opportunities enhance communication among the research community, the public and Sanctuary staff while helping to disseminate current research results to the public in a timely fashion. For example, researchers will continue to be invited to present findings at the Shore to Sea lecture series and Sanctuary Advisory Council meetings. CINMS staff will present information at scientific conferences and workshops. In addition, other venues and opportunities will be explored. Materials will be multilingual when appropriate and necessary.

Status: Implement by year 2

Partners: Sanctuary Advisory Council

(4) Develop a Voluntary Research Registry. CINMS will develop an outreach program to encourage the regional scientific community, who are conducting research that does not require a Sanctuary permit to inform CINMS of the nature and intent of their research. The voluntary research registry allows CINMS to spatially track research activities, understand the types of research activities being undertaken, and have the Sanctuary benefit from research and monitoring findings from projects the Sanctuary did not directly assist.

Status: Permitted and directed research is currently tracked and reported, extramural research tracking will be implemented by year 2, maintain thereafter

Partners: California Department of Fish and Game; Channel Islands National Park; U.S. Fish and Wildlife Service; NOAA Fisheries; U.S. Coast Guard, UCSB

STRATEGY CS.6 – BIOLOGICAL MONITORING OF MPA NETWORK

- *Objective:* To measure the biological effects of the Channel Islands MPA Network.
- *Implementation:* Research and Monitoring staff

Background

An important part of the long term management of the Channel Islands MPA network are programs to monitor and evaluate biological, social, and economic changes in areas that are within, nearby, and distant from the MPAs. Together, these monitoring programs will help managers determine the impacts and effectiveness of the MPA network. MPAs can act as reference sites, providing useful data on natural populations in the absence of fishing pressure. Much needed data on natural mortality rates, growth rates, population structure, effects of various environmental changes, and other parameters can be obtained. CINMS staff works closely with several partner agencies and institutions to implement biological MPA monitoring programs. The biological monitoring for the nearshore MPAs is guided by the *Channel Islands Marine Protected Areas Monitoring Plan*, released in February 2004 by the California Department of Fish and Game (California Resources Agency, CDFG 2004). This plan calls on the Sanctuary and other agencies and institutions for significant staff, vessel and funding contributions. A deep water MPA monitoring plan is in development and is guided by a deep water MPA network monitoring workshop hosted by NOAA in 2003.

Since the MPAs were designated in 2003 and 2007, several existing research and monitoring programs at CINMS have been modified to include monitoring the network. For research and monitoring activities conducted without Sanctuary support or involvement, CINMS will track external research projects that may aid in the Sanctuary's MPA network monitoring efforts.

On February 7-8, 2008 the California Department of Fish and Game, CINMS, Channel Islands National Park and the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) at the University of California, Santa Barbara sponsored a public symposium on the first five years of monitoring, enforcement and education programs for the Channel Islands Marine Protected Area Network. In general, the findings of these first five years of monitoring show consistent differences in abundance and size of species found within the MPAs versus the surrounding waters, including species that are targeted by fishing, such as kelp bass and California sheephead. Research using a remotely-operated vehicle and SCUBA surveys found targeted finfish species monitored had greater densities within the MPAs than those outside. Other studies noted increases in the average size of fish inside MPAs, which can have important ecological effects because larger fish produce exponentially more young than smaller fish. Preliminary research also indicates that California spiny lobsters found within the MPAs are larger in size and in greater abundance than outside MPAs. Mature large sized lobsters are essential to successful reproduction of this valuable fishery (www.dfg.ca.gov/marine/channel_islands/specialsession.asp).

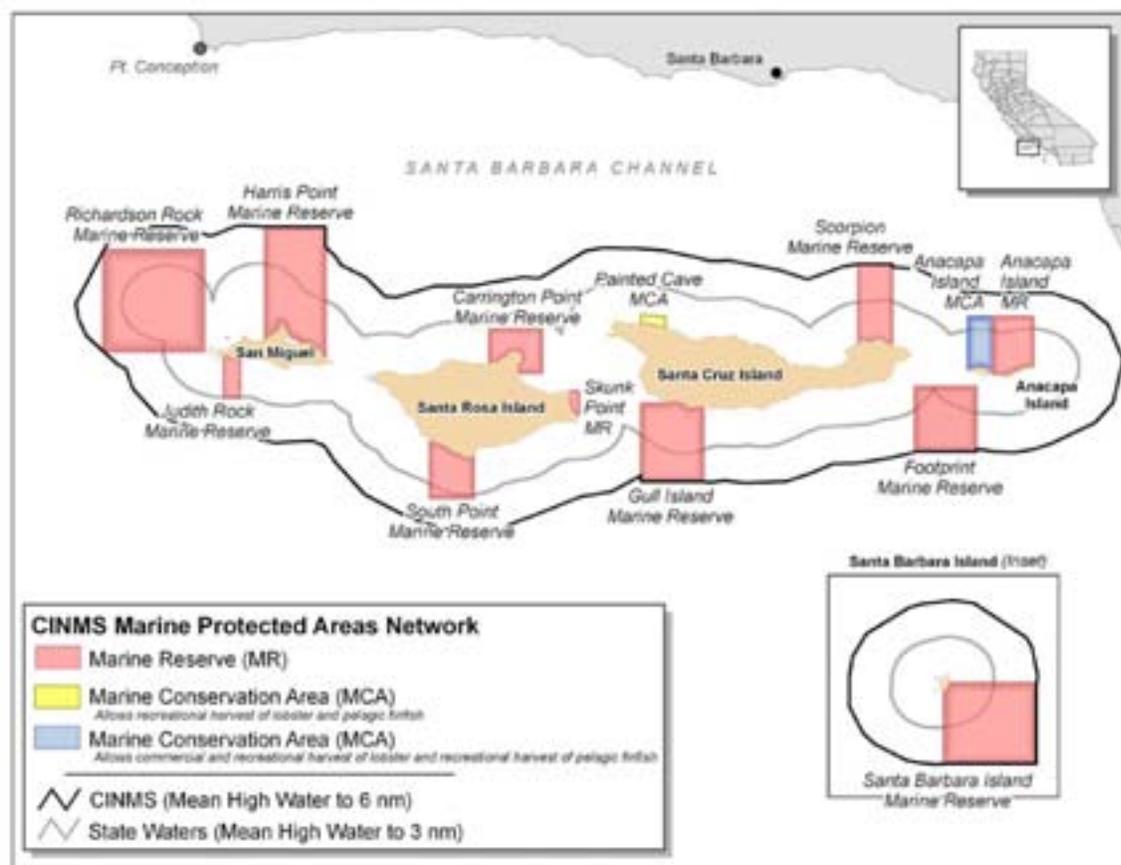


Figure 39. Marine reserves and conservation areas within CINMS (2008)

Activities (3)

(1) Maintain and Expand MPA Network Biological Monitoring Program. CINMS will continue to work closely with the California Department of Fish and Game and other partner agencies and institutions to maintain and further develop biological monitoring programs contributing to evaluating the effectiveness of the MPA network, such as the Remotely Operated Vehicle (ROV) project in partnership with CDFG, Marine Applied Research and Exploration (MARE), and CINMS. This and other existing or envisioned programs are described in the Channel Islands Marine Protected Area Monitoring Plan, a multi-agency document that will be revised periodically to direct highest priority MPA network monitoring projects (California Resources Agency, CDFG 2004).³¹ In years one through five, CINMS will, in partnership with other agencies and institutions, conduct, coordinate and support a variety of monitoring activities. The Sanctuary will also participate in periodic symposia and reporting on MPA network effects.

Status: Program development, coordination, implementation, and evaluation through years 1-5

Partners: California Department of Fish and Game; Sanctuary Advisory Council and Research Activities Panel; National Park Service; NOAA Fisheries; Partnership for Interdisciplinary Study of Coastal Oceans (PISCO); various universities and other experts and organizations

³¹ Available online at http://www.dfg.ca.gov/mrd/channel_islands/monitoring.html.

(2) Utilize Various Existing CINMS Research and Monitoring Programs In Support of the MPA Network. Such programs, which are implemented both inside and outside of MPAs, include but are not limited to:

- The Collaborative Marine Research Project (Strategy CS.4);
- Sanctuary Aerial Monitoring and Spatial Analysis Program (Strategy CS.1);
- Habitat Mapping (See Strategy CS.3);
- Seabird Research (See Strategy CS.3); and
- Biological Monitoring (See Strategy CS.3)

Status: (See status previously listed for each strategy referenced above)

Partners: (See partners previously listed for each strategy referenced above)

(3) Develop and Implement an MPA Network Deep Water Monitoring Plan. Following recommendations made in a 2005 workshop and the establishment of MPAs within CINMS federal waters in 2007, a proposal to characterize and monitor deep water habitat, communities, and populations was developed by West Coast sanctuary staff in 2008. To be fully implemented, further development of the proposal into a plan is necessary. A key part of this development is coordination and collaboration with partner researchers and agencies. In addition, the challenging logistics of working in deep water habitats require that significant funds are available to fully implement the plan and acquiring these funds are critical to the success of the plan. A general description of the proposed monitoring is available in CS.3, activity (1).

Status: Proposal developed in 2008, further development in years 2-5

Partners: USGS, CDFG, NOAA-IOOS, NOS, Research Activities Panel of the Sanctuary Advisory Council

STRATEGY CS.7 – SOCIOECONOMIC MONITORING OF MPA NETWORK

- *Objective:* To demonstrate the socio-economic effects of the Channel Islands MPA network.
- *Implementation:* Resource Protection staff, and Social Science Coordinator

Background

Under a state and federal partnership, a commitment was made in 2003 to monitor and adaptively manage the MPA network within the Sanctuary. In particular, a commitment was made to monitor biological and socioeconomic changes occurring inside and outside the MPA network, and cooperatively and adaptively manage them. The overall goal of socioeconomic monitoring is to identify MPA network effects on human spatial use of the Sanctuary, economic values, local and regional economic impacts, and the knowledge, attitudes and perceptions of Sanctuary users.

CINMS created a social science plan that details an explicit three-year effort to acquire and analyze scientifically rigorous socioeconomic data on all human uses of the Sanctuary. The CINMS *Social Science Plan for 2007 – 2010, Socioeconomic Research & Monitoring of Marine Reserves and Conservation Areas*, is available online at: http://channelislands.noaa.gov/marineres/PDF/ssp_8-29-07.pdf. Basic information from this plan is described next, followed by an overarching activity for this strategy that focuses on developing and implementing a socioeconomic monitoring program.

The spectrum of human uses to be monitored and understood is categorized as consumptive (*e.g.*, commercial and recreational fishing, spear fishing), non-consumptive (*e.g.*, kayaking, diving), passive (*e.g.*, learning about the Sanctuary through reading), and education and research related (*e.g.*, lectures and exhibits). A strategy for addressing MPA network effects to each of these user groups is included in the social science plan.

Data will be required to address three main objectives: (i) test socioeconomic predictions made prior to MPA network designation, (ii) monitor human-sanctuary interactions to inform adaptive management of the MPA network, and (iii) contribute to an ecosystem-based approach to management.

In 2003, over 100 scientists, agency staff, and stakeholders met at a public workshop to provide formal research and monitoring recommendations. With further input from CINMS stakeholders and scientists, these formal recommendations were used to devise a three-year program of research and monitoring presented in the social science plan, including a strategy for each user group, a consultative process for working with stakeholders, and a process for establishing priorities and allocating funds.

Outline of Recommended Research: Socioeconomic research and monitoring objectives and questions to be addressed are as follows:

1. Commercial Fishing -- Identify and measure the effect, if any, that the MPA network is having on commercial fishing businesses, fishing communities, and economies that benefit from fishing. Do impacts of the MPA network financially harm or benefit individual fishermen/businesses (or have no discernable impact)? Do impacts of the MPA network harm or benefit local and/or regional economies? Are there broader social/community impacts from the MPA network? Will data on spillover/replenishment effects support an integrated assessment?
2. Recreational Fishing -- Identify and measure the effect, if any, that the MPA network is having on recreational fishing businesses, individuals, and economies that benefit from fishing. What are the spatial use patterns and intensity of recreational fishing in the Channel Islands, and how has

this changed since the MPA network was designated? Do impacts of from the MPA network financially harm or benefit individual fishermen/businesses? How do the perceptions of recreational fisherman toward the MPA network affect their spatial use patterns and individual businesses that serve them?

3. Non-Consumptive Use -- Identify and measure the effect, if any, that the MPA network is having on non-consumptive uses such as diving, kayaking, and wildlife viewing. What are the spatial use patterns and intensity of these

uses? What are the local expenditures and associated economic impacts on local economies and consumer/producer surplus levels associated with spatial use patterns and intensity? What attitudes, perceptions, and level of knowledge do non-consumptive users have in relation to the CINMS and MPA network? What are the biological and physical attributes of the CINMS that best explain non-consumptive use patterns and associated values? How are such use patterns and associated values likely to change if attributes of the CINMS change?

4. Non-Use -- Identify and measure the effect, if any, that the MPA network is having on values of so-called non-users. Does the MPA network affect existence value, bequest value, and option value?

A strategy that defines priorities, differentiates funded from planned activities, and identifies who will be responsible for each activity is defined for each user group.

Priorities and Process for Funds Allocation: The social science plan identifies the order in which activities will be undertaken and the principals used to derive priorities and allocate new funds.

Consultative Process: It is recognized in the social science plan that socioeconomic research and monitoring cannot take place without cooperation from Sanctuary users, and that human surveys are an important tool for collecting spatial use data. A consultative process is presented that defines protocols for interacting with users, sharing information, and, where necessary, keeping user data confidential.

Activities (1)

(1) Develop and Implement MPA Network Socioeconomic Monitoring Program. CINMS will continue to work closely with NOAA economists, partner agencies and institutions, and Sanctuary users to conduct, coordinate and support socioeconomic monitoring activities in accordance with the CINMS Social Science Plan for 2007 – 2010, Socioeconomic Research & Monitoring of Marine Reserves and Conservation Areas.

Status: CINMS has contracted a Social Science Coordinator annually since 2005, and a 3-year social science plan was finalized in 2007



Figure 40. Sea kayakers near Santa Cruz Island (CINMS)

Partners: NMSP; Sanctuary Advisory Council and Working Groups; National Park Service; California Department of Fish and Game; NOAA Fisheries; various universities and other experts and organizations

STRATEGY CS.8 – AUTOMATED IDENTIFICATION SYSTEM (AIS) VESSEL TRACKING

- **Objective:** To use AIS information to track vessel traffic and vessel trends within the CINMS, enhancing socioeconomic and scientific research as well as Sanctuary resource protection capabilities.
- **Implementation:** Research and Monitoring, and Resource Protection staff, along with Enforcement partners

Background

AIS systems are currently mandatory for ships over 300 Gross Registered Tons, and in coming years these systems will become more prevalent on smaller ships as well as commercial and recreational boats. AIS systems transmit vessel information using FM frequency radio waves. Information transmitted includes: vessel identification data; location (updated every few seconds while underway); speed; heading; destination; cargo; crew complement; and various other ancillary data.

These data are invaluable for many Sanctuary research and enforcement goals, including:

- Monitoring large vessel (ship) traffic, such as:
 - Traffic activity in the shipping lanes;
 - Types of ships (*e.g.*, cargo, tanker, cruise ships);
 - Cargo types (hazardous vs. non-hazardous); and
 - Monitoring ship activity outside of the shipping lanes
- As AIS becomes more prevalent, monitoring small vessel traffic in the CINMS, such as:
 - Small vessel destinations to pinpoint high use areas;
 - Small vessel points of origin to understand from where users are coming; and
 - Monitoring potential impacts of disabled vessels;
- Enhancing SAMSAP (Strategy CS.1) by providing:
 - Verification data for SAMSAP surveys; and
 - Additional data (*e.g.*, vessel points of origin) not collected by SAMSAP
- With partners, providing acoustic monitoring and marine mammal interaction data:
 - Collect and analyze vessel noise data within and around the CINMS; and
 - Determine whether there are correlations between vessel noise and observed marine mammal activity pattern changes.

Activities (4)

(1) Work with Partners to Install an AIS Transceiver Station on the Northern Channel Islands. Also work with the U.S. Navy to integrate the data stream from an existing AIS transceiver on San Nicholas Island.

Status: Implement by year 1

Partners: Channel Islands National Park, U.S. Navy, Navbase Ventura County; Marine Exchange of Southern California; U.S. Coast Guard

(2) Work with Partners to Create an Internet Access Point for CINMS to View Realtime AIS Data and to Download Archival Data Based on Specific Information Needs.

Status: Implement by year 2

Partners: U.S. Navy, Navbase Ventura County; U.S. Coast Guard; Marine Exchange of Southern California; and NOAA NMSP

(3) Download and Analyze AIS Data to Address Research, Monitoring and Management Needs, as Described Above.

Status: Implement in years 2-5

Partners: Internal, Scripps Institute of Oceanography

(4) Work with Scripps Institute of Oceanography to House an AIS Receiver Used to Collect Data on Vessel Traffic as Part of an Ongoing Study of Anthropogenic Noise in the Marine Environment and the Effects on Marine Mammals. This activity addresses Sanctuary Advisory Council anthropogenic noise policy and partnerships recommendation 1: Establishment of a vessel traffic-monitoring program to log and quantify vessel traffic through the Sanctuary.

Status: In place, ongoing through year 5

Partners: Scripps Institute of Oceanography

Table 5. Estimated Costs for the Conservation Science Action Plan

Strategy	Estimated Annual Cost (in thousands)*					Total Estimated 5 Year Cost
	YR 1	YR 2	YR 3	YR 4	YR 5	
CS.1: SAMSAP	\$30	\$40.5	\$23	\$23	\$23	\$139.50
CS.2: Comprehensive Data Management	\$126	\$126	\$126	\$126	\$126	\$630.00
CS.3: Support Monitoring and Site Characterization Programs	-	\$80	\$80	\$80	\$80	\$320.00
CS.4: Collaborative Marine Research Project**	-	\$50	\$50	\$50	\$50	\$200.00
CS.5: Research Interpretation**	-	\$42	\$32	\$32	\$32	\$138.00
CS.6: Biological Monitoring of MPA Network** ¹	\$1,510	\$1,510	\$1,510	\$1,510	\$1,510	\$7,550.00
CS.7: Socioeconomic Monitoring of MPA Network**	\$285	\$285	\$285	\$285	\$285	\$1,425.00
CS.8: Automated Identification System (AIS) Vessel Tracking**	-	\$105	\$30	\$30	\$34	\$199.00
Total Estimated Annual Cost	\$1,951.00	\$2,238.5	\$2,136.00	\$2,136.00	\$2,140.00	\$10,601.50

* Cost estimates exclude base budget funding requirements (salaries, overhead, etc.).

** Contributions from outside funding sources also anticipated.

¹ The substantially high costs of deep water MPA monitoring are reflected here.

Addressing the Issues – Strategies From Other Action Plans

In addition to the strategies identified in this Conservation Science Action Plan, there are other strategies from other action plans directly or indirectly addressing the issues associated with conservation science, such as:

- WQ.1 – Offshore Water Quality Monitoring;
- MH.1 – The Shipwreck Reconnaissance Program;
- RP.1 – Identifying & Assessing Current and Emerging Issues;
- RP.2 – Responding to Identified Issues; and
- OP.8 – Greening Facilities & Operations

Addressing the Issues – Regulations

Not applicable. There are no Sanctuary regulations associated with the issues in the Conservation Science Action Plan. Sanctuary regulations are available at 15 CFR 922.70-922.74.

BOUNDARY EVALUATION ACTION PLAN

Overview

The issue of expanding the Sanctuary's boundary was raised by many people during a series of seven management plan public scoping meetings held in 1999, and has remained an issue of continued interest to numerous constituents.³² This action plan describes the continued study of and decision-making process for a possible change to the Sanctuary's boundary. Analysis of the Sanctuary boundary has been ongoing since early in the management plan revision process and resulted in a range of preliminary boundary concepts (see Vol. I, Appendix D). Work will continue until sufficient data and analysis have been completed, at which point a supplemental environmental review process will be initiated that will ultimately lead to a decision about changing the Sanctuary's boundaries.

Description of the Issues

Three main factors have driven the NMSP's interest in considering whether to propose a change to the CINMS boundary: 1) an emerging understanding of how the Sanctuary's living resources are integrally connected to marine areas outside the CINMS boundary, 2) heightened awareness of human activities occurring outside the Sanctuary which could pose threats to CINMS resources, and 3) high public interest in boundary expansion as expressed clearly during the 1999 public scoping meetings. Since 1999, these factors were considered as the management plan review process evolved. Process history and findings to date are summarized below, with additional details provided in Vol. I, Appendix D.

Scoping Comments

Applying an ecosystem approach to Sanctuary management was one of the most prevalent issues identified during the 1999 public scoping process and subsequent meetings with the Sanctuary Advisory Council. Some of the specific ecosystem-based management comments and ideas that emerged were:

- The Sanctuary should apply an ecosystem approach, adaptive management and other marine management tools to the framework for the management plan;
- CINMS must consider the interconnections of habitats and ecosystems when proposing management actions;
- Sanctuary resource management should be based on a thorough understanding of ecosystem management as an alternative to specific species management and
- The management plan should address terrestrial impacts on the Sanctuary (such as the relationship between human activities in the island watersheds and their effect on intertidal habitats).

Some of the most frequent comments heard during the public scoping period were that the Sanctuary boundary should be expanded to incorporate more of the regional marine ecosystem. Doing so, it was argued, would help CINMS better address management issues associated with coastal watersheds, oil and gas development, water quality, and military activity. It would also provide more opportunities for the Sanctuary to improve overall marine resource protection. CINMS received hundreds of comments

³² CINMS consists of an area of approximately 1110 square nautical miles (nmi) off the southern coast of California. The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six nmi from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (the Islands).

(including three petitions with over 1500 signatures) in support of expanding the Sanctuary.³³ CINMS also received less than a hundred comments that expressed opposition to the idea of expanding the Sanctuary boundary. Some of the specific boundary-related comments included:

- CINMS should expand its boundary to include the entire Santa Barbara Channel and Santa Catalina Island;
- CINMS should expand its boundary north to San Luis Obispo and the Santa Lucia Bank to better incorporate regional resources and dynamic attributes (upwelling areas, spawning grounds for certain fish species, etc.);
- CINMS should expand its boundary north to meet the southern edge of the Monterey Bay National Marine Sanctuary;
- CINMS should expand its boundary north to Santa Rosa Creek to better protect biodiversity;
- CINMS should evaluate the advantages for the ecosystem by expanding its boundary;
- CINMS should not expand its boundary and
- To better protect biodiversity, CINMS should redraw its boundary to include the Nipomo Dunes and Point Sal.

Determining a Study Area

Immediately following the public scoping meetings, CINMS staff began compiling updated information about the Sanctuary, including its natural and historical resources, trends in human use and activities, and potential threats to Sanctuary resources and qualities within and adjacent to the CINMS. This was done in response to comments and concerns raised during the public scoping meetings and to gain a better understanding of the larger marine ecosystem and human environment within and surrounding the Sanctuary. Defining a geographical “study area” within which to collect data was the first step in this process. Determining a study area was also required to begin work on the Draft Environmental Impact Statement (DEIS) so environmental and socioeconomic impacts from any proposed changes to CINMS management could be assessed within and adjacent to the Sanctuary.

In 2000, CINMS contracted Dr. Michael McGinnis to provide recommendations on the location of an appropriate study area. This work was contracted specifically to provide information to the Sanctuary useful for determining a management plan study area. The McGinnis (2002) study, called “A Recommended Study Area for the CINMS Management Planning Process: Ecological Linkages in the Marine Ecology from Point Sal to Point Mugu,” evaluated the state of knowledge on oceanographic conditions and processes (*e.g.*, water temperatures, currents and upwelling patterns), the range and distribution of marine species found near the Channel Islands, and the status of marine and coastal habitats within the Sanctuary region. It also evaluated such factors as the extent of interconnectedness between species found within the Sanctuary, their needs for outlying habitats and food sources, and the interplay of oceanographic processes. Of particular importance was the finding that the spatial extent of the Sanctuary’s two bioregions (cold temperate, warm temperate) and the transition zone between them fluctuates more northward than previously known. As such, McGinnis recommended a study area extending from the current Sanctuary boundary to the mainland coast, northward to Point Sal, and southward to Point Mugu. CINMS staff discussed McGinnis’ recommendations with the Sanctuary Advisory Council and Sanctuary stakeholders, and determined the final management plan study area (Figure 41), which extends approximately from Point Sal to Point Dume.

³³ The majority of these comments encouraged CINMS to expand the Sanctuary boundary to the mainland coast.

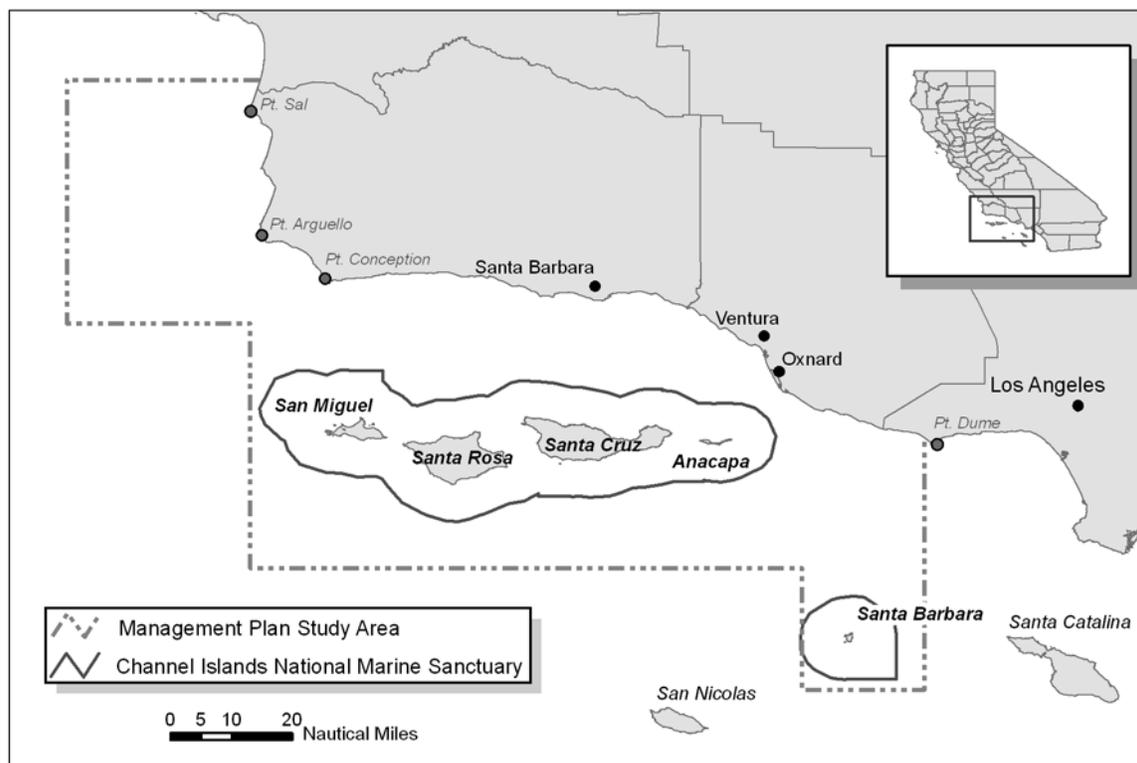


Figure 41. CINMS Management Plan Review Study Area

The study area contains a diverse array of natural resources, ecological qualities and historical/cultural resources (detailed information about all of these features is found in the FEIS (Vol. II, Section 3.0). Several activities and human-influenced processes occur within the study area as well, including but not limited to:

- Military activities such as training exercises, military testing and evaluation projects for aircraft, ship and missile programs, commercial and military space launches;
- Inputs to coastal marine waters from nonpoint source pollutants (such as coastal watershed runoff) and point-source pollution discharges (including municipal treatment facilities and power plants);
- Offshore oil and gas activities such as exploratory seismic surveys, effluents from oil and gas production, potential spills from pipelines, platforms, and tankers, and the possible decommissioning and potential removal (or not) of platforms;
- Commercial fishing;³⁴
- Recreational fishing;³⁵
- Motorized personal watercraft use; and
- Port and harbor operations.

³⁴ To obtain some of this information, CINMS often referred to an ethnographic data survey of long-time mariners familiar with Sanctuary waters (Airame and Simon 2000). This survey characterizes the value of knowledge many of these individuals have about the Sanctuary ecosystems. See the Human Activities action plan for descriptions of these activities and management actions CINMS is proposing to address them.

³⁵ *Ibid.*

Considering Preliminary Boundary Concepts

With a better understanding of ecosystem connectivity and human use patterns within the study area, Sanctuary staff and the Advisory Council then began to discuss possible alternatives to the existing Sanctuary boundary. These public discussions with the Advisory Council led to the development a wide range of preliminary Sanctuary boundary concepts within the study area to be further analyzed. These boundary concepts initially included a status quo (no change) boundary configuration along with six expanded boundary configurations. Sanctuary staff then worked with NMSP headquarters staff to refine these preliminary boundary concepts, which resulted in a suite of alternatives including the status quo configuration plus five boundary concepts. These concepts are described in Vol. I, Appendix D.

In discussing the possibility of expanding the Sanctuary's boundary, and in comparing the various preliminary boundary concepts, several criteria were considered. Table 6 lists some of the main criteria analyzed by staff and reviewed at meetings and special workshops of the Advisory Council.

Table 6. Criteria Used in the Consideration of CINMS Boundary Alternatives

Category	Criteria
Ecosystem/ Biogeographic	Contains nationally significant living resources; vital habitats, resources needing protection from human activities, and a definable ecosystem unit.
	Contributes to maintaining, restoring or enhancing living resources, biological diversity, ecosystem structure, and maintenance of ecologically and commercially important species, threatened species or assemblages.
	Contributes to the biogeographic representation of the site.
Social/Cultural	Contains nationally significant non-living or human use resources, nationally significant cultural, archaeological, historical or paleo-ecological resources, areas significant to research, education, and recreation or of aesthetic value.
	Contains resources generating tourism, areas in which human activities are conducted that may need to be managed to protect resources, areas necessary to maintain access to larger areas.
	Future trends in uses depending on or impacting resources
	Impacts to socio-economic uses that may result from Sanctuary designation
Administrative	Provides opportunity for ecosystem-based management.
	Provides opportunity for integrated coastal watershed management.
	Supports, promotes, and coordinates scientific research.
	Cooperates with global programs.
	Contributes to comprehensive and coordinated conservation management.
	Facilitates public and private uses compatible with resource protection.
The area is suitable for monitoring and enforcement.	

Sanctuary Advisory Council Recommendation

In August 2000, after months of deliberation, the Advisory Council delivered a split recommendation to the Sanctuary Manager (now referred to as Sanctuary Superintendent) regarding a preferred boundary concept. One suggested boundary concept extended to the rural Gaviota coast, while avoiding the urban coast (including ports and harbors); the other recommended CINMS consider a relatively unchanged boundary alternative, featuring a "squaring off" of current boundaries and slight expansion to encompass a defunct chemical munitions dumpsite south of Santa Cruz Island.



Figure 42. Anacapa Island (Glenn Allen)

NOAA Decision to Continue Boundary Analysis

Following the Advisory Council recommendation, NMSP headquarters staff revisited the boundary issue, analyzing criteria (Table 6) and considering input received from the public, stakeholder groups and various agencies. In the summer of 2002, the NMSP concluded conducting additional scientific data collection and analysis was desirable in order to make a more informed decision on boundary expansion. In particular, it was determined a detailed study of the Channel

Islands regional biogeography was needed and would be conducted by NOAA's National Centers for Coastal Ocean Science (NCCOS). It was also determined, because the biogeography assessment was ongoing during development of the Draft Management Plan, no changes to the boundary would be proposed as part of this management plan revision; however, public comment on the preliminary boundary concepts (see Vol. I, Appendix D) is welcomed. NCCOS completed the biogeography assessment in 2005. After conclusion of the management plan revision process, the NMSP will conduct a supplemental environmental review process to consider boundary change options (as well as the status quo boundary), consider additional public comment and Advisory Council input, and identify a preferred boundary alternative. The NMSP will incorporate results of the NCCOS biogeography assessment into the supplemental environmental review process.

The remaining environmental review steps are described in the strategies of this action plan.

Addressing the Issues – Strategy For This Action Plan

The issue of determining the appropriate location of the Sanctuary's boundary is one that has undergone intense scrutiny and study since 1999. The strategy in this action plan presents a straight-forward plan for reaching a conclusion on this issue. The strategy herein outlines the subsequent supplemental environmental review and analysis that will lead to a final determination on the Sanctuary boundary (Strategy BE.1).

It is important to restate that this management plan does not propose any Sanctuary boundary changes at this time, but rather calls for the continuation of a comprehensive, scientifically-based, open public process that will lead to a sound decision in the future. Preliminary boundary concepts previously developed with community input are provided in Vol. I, Appendix D. Additional opportunities for public comment will be provided during the supplemental environmental review. Following the strategy below, Table 7 presents estimated costs for the Boundary Evaluation Action Plan.

STRATEGY BE.1 – FINAL DETERMINATION ON BOUNDARY ISSUE

- *Objective:* To conduct a scientifically rigorous, open public process to consider, analyze and make a final determination on changing the boundary of the Sanctuary.
- *Implementation:* Research and Monitoring, Education and Outreach, Resource Protection, Technology Integration and Management, and Community and Management Planning staff

Background

This strategy presents steps in an environmental review and decision-making process leading to a final decision on changing of the Sanctuary boundary. The environmental review process will build on significant work done to date, including the NCCOS biogeography assessment. In addition, in compliance with the National Environmental Policy Act (NEPA), the potential environmental and socioeconomic impacts associated with any boundary change alternative will be analyzed, documented in a supplemental environmental impact statement, and made available for public review and comment. The process will be open and transparent to the public, involving significant discussion with and input from the Advisory Council and other interested agencies and parties.

Activities (2)

(1) Prepare and Release Draft Supplemental Environmental Impact Statement/ Supplemental Management Plan. This activity encompasses a number of process steps to be taken in sequence, including: a) assimilation of biogeography assessment findings into a framework for fully analyzing boundary change options; b) development of a draft Supplemental Environmental Impact Statement (SEIS) and draft Supplemental Management Plan (SMP) to support consideration and analysis of various boundary change alternatives, and c) release of the draft SEIS/SMP to solicit and consider public and agency comments and suggestions. The Sanctuary Advisory Council will be an important body to offer review comments, feedback, and recommendations on boundary alternatives proposed within the SEIS/SMP.

Status: To be initiated after completion of final management plan

Partners: Multiple agencies, Sanctuary Advisory Council

(2) Issue Final SEIS/SMP; Make Final Decision on Boundary. This activity also encompasses a number of process steps leading to a final decision on the Sanctuary boundary. These steps include: a) responding to all comments received on the draft SEIS/SMP, b) developing a final SEIS/SMP; issuance of additional Sanctuary regulations, if necessary.

Status: To be initiated after completion of the draft Supplemental Environmental Impact Statement

Partners: Internal

Table 7. Estimated Costs for the Boundary Evaluation Action Plan

Strategy	Estimated Annual Cost (in thousands)*					Total Estimated 5 Year Cost
	YR 1	YR 2	YR 3	YR 4	YR 5	
BE.1: Final Determination on Boundary	\$0	\$125	\$125	\$0	\$0	\$250
Total Estimated Annual Cost	\$0**	\$125	\$125	-	-	\$250

* Cost estimates exclude base budget funding requirements (salaries, overhead, etc.).

** Includes funds expected from the NMSP.

Addressing the Issues – Strategies From Other Action Plans

While this action plan is in some ways unique among those found in this management plan, there are some strategies that may serve to better inform the analysis and decision-making processes needed to reach a sound decision on the boundary change issue. Related strategies include:

- RP.1 – Identifying & Assessing Current and Emerging Issues;
- CS.3 – Supporting Monitoring and Site Characterization Programs;
- CS.5 – Research Interpretation;
- WQ.2 – Water Quality Protection Planning; and
- OP.1 – Sanctuary Advisory Council Operations

Addressing the Issues – Regulations

Sanctuary regulations establish the boundary of the CINMS and the set of regulations applicable to that boundary. Sanctuary regulations are available at 15 CFR 922.70-922.74.

Any consideration of expanding the CINMS boundary will involve an analysis of the applicability and impact of Sanctuary regulations within any expanded Sanctuary area. The process of developing a Supplemental Environmental Impact Statement (SEIS) will require a comprehensive analysis of regulatory options and impacts with regard to a range of boundary alternatives. Subsequent to analysis and a public review of the SEIS, and issuance of a Final Supplemental Environmental Impact Statement (FSEIS), a Final Rule will establish Sanctuary regulations within the CINMS boundary, if changed.

WATER QUALITY ACTION PLAN

Overview

This action plan describes the Sanctuary's management strategies for understanding and addressing water quality. Traditionally, the Sanctuary's water quality efforts have been primarily limited to supporting select monitoring projects conducted by outside parties, facilitating public discussion and investigation of water quality issues (through the Sanctuary Advisory Council and its working groups) and producing various education and outreach materials aimed at teaching basic water quality and watershed science as well as promoting practices to limit pollution. This action plan addresses the need for and commitment of CINMS to work in partnership with many individuals and entities to find answers to important unanswered questions about water quality, from science to management policies and regulations.

The offshore water quality monitoring strategy contained in this action plan demonstrates the NMSP's ongoing commitment to better understand water quality conditions and dynamics in the Southern California Bight and Santa Barbara Channel. Water quality monitoring data is used to evaluate and understand localized and large-scale spatial and temporal impacts from natural and anthropogenic sources, and their potential or actual impacts on Sanctuary resources. These data may also have utility for evaluating the effectiveness of water quality management efforts over time. The NMSP commitment to water quality is bolstered by several NMSP-wide performance measures pertaining to water quality:

- By 2015, 12 sites with water quality being maintained or improved;
- By 2010, 100% of the [National Marine Sanctuary] System is adequately characterized; and
- By 2020, 14 sites that have implemented monitoring programs, based on the System-Wide Monitoring program framework, for relevant natural and maritime archaeological resources.³⁶

The water quality protection planning strategy (WQ.2) explains how the Sanctuary will prioritize threats and look for potential areas of cooperation and integration with existing water quality resources and management programs. CINMS will take a partnership-based approach to water quality protection in order to leverage outside resources and expertise and given that many priority Sanctuary water quality issues may be best addressed by management programs already established in the region. A key to making progress on protecting Sanctuary water quality is to recognize which programs are most suitable for addressing water quality issues, and, if necessary, identify how these programs can be enhanced to ensure appropriate water quality conditions. It is also important to determine if any water quality issues warrant the inception of additional Sanctuary-directed water quality protection programs.

The Sanctuary developed this action plan with guidance from the NMSP West Coast Region Water Quality Coordinator. This position was originally intended to serve as the lead for implementing Strategy WQ.2, and to provide overall guidance for implementing this action plan. However, this position has been vacant since 2006. Consequently, until or unless CINMS and West Coast Region staff are able to acquire dedicated water quality personnel, other staff will strive to implement this action plan.

³⁶ Program-wide performance measures are contained in the Performance Evaluation Manual for the Office of National Marine Sanctuaries, which is available online at <http://sanctuaries.noaa.gov/management/effective.html>.

Recent Water Quality Work in the Sanctuary

In 2005 the Sanctuary Advisory Council adopted a water quality report submitted by the Advisory Council's Conservation Working Group: *A Water Quality Needs Assessment for the Channel Islands National Marine Sanctuary*.³⁷ The report contains over twenty specific recommendations within the general categories of water quality: 1) action planning; 2) research and monitoring; 3) jurisdiction, regulations, and policy; and 4) public education and outreach. These recommendations are presented in Appendix E. The report also contains detailed descriptions of water quality pollution sources. The information and recommendations contained in the Advisory Council's assessment, coupled with the information and activities provided in this action plan provide a knowledge base, and framework that the Sanctuary can use to build a water quality program.

Assessing water quality conditions in the Sanctuary will be greatly assisted by the work of Dr. Diana Engle, who in 2006 developed a report for the National Park Service entitled, *Assessment of Coastal Water Resources and Watershed Conditions At Channel Islands National Park California*.³⁸ The purpose of this report was to:

...examine existing information pertaining to water quality, the condition of aquatic habitats and their biota, sources of point and non-point pollution in the region, avenues of transport of pollutants to Park waters, and threats to aquatic resources stemming from consumptive and non-consumptive uses of Park habitat. In addition, the report identifies current information gaps and makes recommendations for addressing them. (Engle 2006)

Dr. Engle has partnered with Santa Barbara Channelkeeper to help develop a water quality characterization report for the Sanctuary, described below in Strategy WQ.2.

In 2005, CINMS partnered with Santa Barbara Channelkeeper to develop a pilot water quality monitoring project for the waters off of Santa Cruz and Anacapa islands (described in more detail in Strategy WQ.1). The pilot program was a cooperative effort to better understand existing conditions and potential water quality issues associated with boating within the Sanctuary, especially at anchorages. The pilot project can help to inform decisions about when, where, and how to conduct long-term water quality monitoring at the islands.

Description of the Issues

Sanctuary water quality was a commonly expressed issue at all of the management plan revision public scoping meetings. In recent years, the increased frequency and extent of regional beach and shellfish-bed closures coupled with decreases in some local fishing catches are taken as signs of declining water quality in the Sanctuary region. CINMS received scores of comments on water quality issues from various interests in the regional communities. Sanctuary staff, working with the Advisory Council, then synthesized the comments related to water quality, researched the issues more fully, and developed the following list of priority sub-issues:

- CINMS needs a comprehensive, coordinated plan for protecting resources from water quality impairment;
- CINMS should increase water quality public awareness, research and monitoring;

³⁷ The water quality needs assessment is available on line at: <http://channelislands.noaa.gov/sac/pdf/10-17-05.pdf>.

³⁸ Dr. Engle's report is available online at: <http://www.nps.gov/chis/naturescience/assessment-of-coastal-water-resources.htm>.

- The Sanctuary should be proactive about terrestrial impacts on water quality;
- CINMS should address water quality impacts from outside the Sanctuary boundary from potential sources such as power plants, vessels, coastal runoff, treatment plants and shipwrecks containing hazardous materials; and
- The Sanctuary should increase partnerships with coastal watershed and water quality groups, other regional water quality authorities, and organizations currently collecting water quality data.



Figure 43. Willows Anchorage, Santa Cruz Island
(Adrian M. Wenner)

These sub-issues indicate water quality in the study area and Sanctuary is affected by pollution from a variety of terrestrial and marine-based activities and land uses. Because many pollutants can be carried to the Sanctuary by ocean currents, the spatial extent of water quality threats is much larger than the Sanctuary itself. This pollution is from both point sources (such as power plants or treatment plants) and nonpoint sources (such as urban runoff), explained in more detail below. These sub-issues also demonstrate a need for greater coordination among the numerous federal, state, and local government entities and other organizations playing roles in water quality protection within the study area. For example, various aspects of water quality in the study area are addressed by the U.S. Environmental Protection Agency Region Nine, the California State Water Resources Control Board, the Central Coast (region three) and Los Angeles (region four) Regional Water Quality Control Boards, the California Coastal Commission, Ventura and Santa Barbara Counties, and many municipalities, to name a few. CINMS will build partnerships with these and other water quality authorities and organizations to determine which programs best address particular water quality issues, to enhance existing water quality protection programs, to identify needs for additional programs, and to address water quality education and outreach, and research and monitoring.

Two categories of pollution are the principal factors affecting Sanctuary water quality: point source and non-point source. When it occurs, *point source pollution* can be traced to identifiable sources, such as oil platforms, power plants, ocean dumping and marine debris sites, industrial effluent discharge sites, municipal sewage treatment plants, and surface runoff (including storm outfalls and dry weather flows). *Nonpoint source pollution* originates from diffuse sources, such as atmospheric deposition and agriculture, urban, and industrial activities. As runoff moves over and through the ground picking up and carrying away natural and human-made pollutants, it deposits them into lakes, rivers, wetlands, and coastal waters.

Point and nonpoint source pollution can impact marine resources in a number of ways. Toxic effluents can lead to metabolic impairment or cellular damage, physiological damage or behavioral changes at the organism level, changes in mortality or biomass at the population level, and changes in species distribution or altered trophic interactions at the community level (Klee 1999). Re-suspended sediments

may impact benthic marine life by interfering with filter feeding and respiratory functions and causing a loss of food sources and habitats. Organic contaminants in the marine environment may lower photosynthesis and oxygen levels and introduce disease. High nutrient concentrations can lead to eutrophication, causing excess algal growth and oxygen depletion. Some point source discharges have the potential to introduce non-native species into the environment. Marine debris can lead to injury or mortality of marine mammals and seabirds through ingestion and entanglement. Effluents may introduce disease-causing microorganisms (pathogens), such as bacteria, protozoans, and viruses, into the marine environment.

Numerous statutes regulate a variety of issues related to water quality. Many of the programs these acts established, and the agencies charged with implementing them are described in detail in the FEIS (Vol. II, Sections 3.3.5, 3.5.3.4, 3.5.4.4, and 5.2).

Point Source Pollution

Approximately 82 percent of municipal wastewater effluents, 70 percent of the power plant-returned cooling waters, 95 percent of the discrete industrial wastes, and 71 percent of the surface runoff into the Southern California Bight enters the coastal waters between Point Dume and San Mateo Point (Anderson *et al.* 1993), which incorporate the mainland coast adjacent to the Sanctuary. Anderson *et al.* (1993) also identified 178 discrete sources of contaminant and nutrient input to the Southern California Bight from Point Conception to the Mexican border. Of these, 26 are in the Channel Islands region and consist of oil platforms, sewage outfalls, power plants, ocean dumping sites, industrial waste, and storm water outfalls. Potential impacts to Sanctuary water quality from these sources vary and are described below.

Municipal Treatment Plants

Most of the water used for domestic and industrial purposes in the coastal region adjacent to the Sanctuary enters municipal treatment (or sewage) plants³⁹ and eventually empties into the ocean (Table 8). The largest freshwater inputs (and probably the largest sources of nutrients and contaminants) in the waters in and around the Sanctuary are the Santa Clara and Ventura Rivers and the Oxnard municipal treatment plant (Anderson *et al.* 1993).⁴⁰

Table 8. Publicly Owned Treatment Works (POTW) Discharging Into the Sanctuary Region

POTW Name	Receiving Water	Level of Treatment	Volume Discharging (mgd)
City of Lompoc	Santa Ynez River	Secondary	3.72
Goleta	Santa Barbara Channel	Primary/Secondary	5.2
Santa Barbara	Santa Barbara Channel	Secondary	8.1
Montecito	Santa Barbara Channel	Secondary	1.1
Summerland	Santa Barbara Channel	Tertiary	0.17
Carpinteria	Santa Barbara Channel	Secondary	1.5
Oxnard	Santa Barbara Channel	Secondary	19.5

Source: Anderson *et al.* 1993

Sewage discharge can result in significant negative impacts to humans and coastal and marine resources. These impacts are typically caused by:

³⁹ Surface runoff is approximately 68% the volume of municipal wastewater discharge (Polhemus 2006).

⁴⁰ Pursuant to the FWPCA, municipalities are required to provide secondary treatment (physical and biological) of discharge. However, FWPCA 301(h) allows the EPA to waive the full secondary sewage treatment requirement if a municipality meets certain conditions specified in that section. The Central Coast Regional Water Quality Control Board has issued Goleta Sanitary District a timeline to upgrade their treatment plant to full secondary standards by November 1, 2014.

- Introduction of disease-causing bacteria;
- Eutrophication (the introduction of excess nutrients, causing excess algal growth and oxygen depletion);
- Introduction of suspended particulates; and
- Introduction of toxic wastes, heavy metals and PCBs.

Power Plants

Power plants discharge cooling water carrying waste heat, along with a small volume of contaminants such as chlorine. The volume of discharges from power plants is 10 times the volume of discharges from municipal wastewater treatment plants; moreover, power plant discharges yield the largest volume of inflow in the Southern California Bight (Anderson *et al.* 1993). Currently, two power plants (both located in Ventura County) discharge into the Sanctuary region. Power plants may have the following impacts on marine organisms and habitats:

- Effluent toxicity;
- Sediment input and destruction of benthic biota;
- Interference with the filter feeding and respiratory functions of marine organisms;
- Loss of food sources and habitats;
- Impingement of living marine resources on cooling water intake screens and entrainment through cooling water systems; and
- Thermal impacts from cooling water.

Oil and Gas Activities

Sanctuary water quality is susceptible to potential oil-well blowouts, pipeline leaks, oil tanker spills, activities associated with decommissioning of platforms (see the oil and gas issues description in the Emergency Response & Enforcement Action Plan), and natural seepage. In addition, pollutant discharges are associated with routine operations of oil and gas development, including the release of effluents consisting of drill cuttings and mud, sewage, formation waters, and corrosion products.⁴¹

Oil and Gas Seeps

As described in the FEIS affected environment section, there are numerous naturally occurring oil and gas seeps in the Santa Barbara Channel (Norris and Webb 1990). The rate of oil seepage from the South Ellwood anticline, located about three kilometers offshore in the Santa Barbara Channel, is one of the highest in the world. The seeps are a major source of marine pollution because the oil they release accumulates in large slicks. This natural seepage releases more hydrocarbon gases than all of the mobile sources (mostly automobiles) in Santa Barbara County.

⁴¹ Platforms in federal waters can either discharge to the ocean in compliance with the National Pollutant Discharge Elimination System (NPDES) permit requirements or send their discharges ashore for treatment and disposal. Discharges from oil and gas operations in state waters are regulated by discharge permits, which specify limits for waste discharge constituents, as well as monitoring requirements for verifying compliance with permit conditions and ensuring the discharges do not cause significant impacts to the quality of receiving waters. Although platforms in state waters are permitted to discharge to the ocean, most discharges are sent to onshore facilities. Muds and cuttings are transported to landfills for disposal. Produced water is either re-injected back into the well or sent ashore to a produced water treatment facility where it may then be discharged to the ocean or to a sewer system. Sanitary waste is either discharged to the ocean, or transported to shore and discharged to a sewer system.

Ocean Dumping, Disposal and Marine Debris

Active dredged material disposal sites in the Sanctuary region include the Los Angeles/Long Beach LA-2 (Anderson *et al.* 1993) and the base of Hueneme Canyon (NOAA 1996). Inactive sites, which may act as nonpoint source pollution sites, include chemical dumpsites located in the vicinity of the Santa Lucia Bank and south of Santa Cruz Island formerly designated and/or used for government chemical munitions dumping; an area southeast of Santa Barbara Island charted as a disused explosives dumping area (NOAA 1996); and a low-level radioactive waste dumpsite offshore from Point Hueneme (U.S. EPA 1983).

Typically, water quality impacts from dumping and /or disposal are highly dependent on such factors as ocean currents and distribution of contaminants, chemical interactions of dumped/disposed materials in water and associated degradation time, and short-term and long-term biological effects of absorption in living marine resources (such as invertebrates, marine mammals and fish).

Disposal of industrial effluents can include toxic organic chemicals such as detergents, oil and industrial solvents, as well as toxic metals such as mercury and lead. Industrial contaminants can affect marine organisms at several levels, including:

- Metabolic impairment or damage at the cellular level;
- Physiological damage or behavioral changes at the organism level;
- Changes in mortality or biomass at the population level; and
- Changes in species distribution or altered trophic interactions at the community level (Klee 1999).

Most marine debris is land-based in origin and can come from such sources as malfunctioning sewage treatment plants, sewer overflows, inadequate solid waste programs and facilities, beach users, and storm water runoff. This debris may be inadvertently deposited, such as debris lost at sea or blown into the ocean. Marine debris also comes from accidental discard and illegal trash dumping at sea. Illegal dumping poses a threat to human health and safety, and injures and kills marine mammals, seabirds and sea turtles through ingestion and entanglement. A Southern California Coastal Water Research Project (SCCWRP) study found man-made

The Case of the Pacbaroness

A recent example of a toxic accident near the Sanctuary involved the bulk-carrier *Pacbaroness*, which collided with the car carrier *Atlantic Wing* off Point Conception in 1987. The *Pacbaroness*' cargo consisted of over 21 thousand metric tons of bulk copper concentrate. The copper concentrate cargo was observed discoloring the water as the vessel sank. Researchers recently began collecting sediment samples from the vicinity of the vessel to determine the extent of copper contamination, although these have not yet been summarized. The amount of copper concentrate that has entered the environment as a result of this accident remains unknown. Copper concentrate is toxic to marine organisms.

In addition to copper concentrate, the *Pacbaroness* held a combined volume of approximately 379,000 gallons of fuel and lubricating oil. Oil reaching the surface in the first few hours after the *Pacbaroness* sank was estimated at 20,000 to 75,000 gallons. Significant amounts of oil continued to leak for another four days then tapered off to an estimated few gallons a day.



*The Pacbaroness Sinking, 1987
(Glenn Allen)*

debris occurred in approximately 14 percent of the mainland shelf of the Southern California Bight (Moore and Allen 1999). Man-made debris was most common in the central (urbanized) region on the outer shelf, and in areas near municipal sanitary sewer system outlets (Moore and Allen 1999). With support from NOAA's Marine Debris Program, CINMS has worked on marine debris removal projects with partners including the City of Santa Barbara, and the University of California Davis' SeaDoc Society.

Vessel Discharge/Deposit

Discharge of oil, sewage, graywater and non-biodegradable materials from vessels is an ongoing issue of concern for the Sanctuary, particularly with regard to such discharges from large vessels like cargo ships and cruise ships. Although pollutant discharge/deposit is strictly regulated in Sanctuary waters, awareness of and compliance with these regulations is an ongoing challenge for CINMS management. In addition, polluting activities occurring beyond the boundary of the Sanctuary (e.g., spills or discharges) pose a threat to and may negatively impact Sanctuary resources and qualities.

Vessel sewage discharges are more concentrated than domestic land-based sewage. They may introduce disease-causing microorganisms (pathogens), such as bacteria, protozoans, and viruses, into the marine environment (U.S. EPA 2007). They may also contain high concentrations of nutrients that can lead to eutrophication (the process that can cause oxygen-depleted "dead zones" in aquatic environments).

Vessel graywater can contain a variety of substances including (but not limited to) detergents, oil and grease, pesticides and food wastes (Eley 2000). Very little research has been done on the impacts of graywater on the marine environment, but many of the chemicals commonly found in graywater are known to be toxic (Casanova *et al.* 2001). These chemicals have been implicated in the occurrence of cancerous growths in bottom-dwelling fish (Mix 1986). Furthermore, studies of graywater discharges from large cruise ships in Alaska (prior to strict state effluent standards for cruise ship graywater discharges) found very high levels of fecal coliform in large cruise ship graywater (well exceeding the federal standards for fecal coliform from Type II marine sanitation devices, or MSDs, designed to treat sewage). These same studies also found high mean total suspended solids in some graywater sources (exceeding the federal standards for total suspended solids from Type II MSDs).

Discharge/Deposit From Vessel Accidents and Shipwrecks

Vessel groundings on shore and vessel collisions can lead to the discharge of oil, debris, and other pollutants. Similarly, the hazardous cargos, abandoned fuel and possible unexploded ordinance inside the metal hulls of slowly deteriorating deep-water shipwrecks may also threaten Sanctuary resources. A recent example of a toxic accident from a shipwreck in the Sanctuary region was the bulk carrier *Pacbaroness* that sank off of Point Conception in 1987 (see text box above).

Nonpoint Source Pollution

Nonpoint source pollution occurs when rainfall or irrigation runs over the land or through the ground, picks up pollutants and carries them to streams, rivers, wetlands and coastal waters and, during heavy rainfall, further offshore. The U.S. EPA identifies nonpoint source pollutants as the nation's largest source of water quality problems, and urban runoff as the largest source of water quality impairments to the estuaries it surveys (U.S. EPA 2002).

In the Sanctuary region, nonpoint source pollution sources are widespread. All regional watershed drainages include urban and agricultural lands yielding nonpoint source pollution. Dams, forestry, grazing, development, construction, and the physical alteration of streambeds also contribute to nonpoint source pollution. Common nonpoint source pollutants are sediments and nutrients such as fertilizers. Other nonpoint sources pollutants in the study area may include:

- Herbicides and insecticides from urban and agricultural runoff;
- Soil, grease, toxic chemicals, and heavy metals from urban runoff;
- Bacteria, viruses, and nutrients from livestock, pet wastes, and faulty septic systems;
- Accidental spills of fuel and other hazardous materials; and
- Air pollutants settling from the atmosphere into the ocean.

Watershed Runoff and Sediment Plumes

The semi-arid climate of Southern California is characterized by intense, intermittent rainfall during winter and seasonal drought during summer and autumn. Floods of coastal watersheds result from intense storms that can be exacerbated by natural phenomena such as El Niño. The time from rainfall to runoff is fairly immediate (within hours) due to the steep terrain of the foothills and Santa Ynez Mountains (Mertes *et al.* 1998). Sediments enter the coastal lagoons, estuaries, wetlands, marshes, beaches, and coastal waters, and eventually, the Santa Barbara Channel.

During winter storms, the Sanctuary region's four main rivers (the Santa Clara, Ventura, Santa Maria and Santa Ynez) discharge along the mainland coast. The Santa Clara and Ventura Rivers can produce a large sediment plume from the eastward end, moving westward into the Channel and surrounding Anacapa Island. The Santa Maria and Santa Ynez Rivers enter the Channel from the west. Upwelling following major storm events can move fine sediments toward San Miguel Island. During flood years, millions of tons of material containing nutrients and pollutants such as animal wastes, pesticides, fertilizers, PCBs, and oil can be transported into the Southern California Bight in as little as one or two days (Hickey 2000b).

In addition, the coastal mainland includes the San Antonio Creek watershed and 41 small coastal watersheds draining the south side of the Santa Ynez Mountain Range. While providing important nutrients to the Sanctuary environment, the creeks of these watersheds also contribute pollution from agricultural and urban runoff.

Coastal Wetlands

The Sanctuary region's coastal mainland watersheds include wetlands, estuaries, lagoons and other systems important to CINMS resources. These areas serve as fundamental feeding, breeding, and nursery grounds for a wide variety of species while providing natural filtration of land-based pollutants. Roughly 10 percent of the historic wetlands of Southern California remain as most have been destroyed by development (Page 1999).⁴² The coastal area between Coal Oil Point and Point Sal comprises only 15 percent of Southern California's coast, yet holds approximately 50 percent of its remaining rural and natural coastline. These coastal wetlands are recognized as "significant biological resources" (Zedler 1982) and "environmentally sensitive habitat" (County of Santa Barbara 1982). The ecological productivity of these coastal wetlands is limited by the general impacts of suburban, industrial, and agricultural development. Nutrient input into coastal and marine systems can stimulate algal growth, reduce abundance and diversity of invertebrates, impact bird-feeding behavior, and reduce oxygen concentration in the water column.

Research has detailed the adverse affects of runoff on wetlands. Nitrogen inputs from watersheds may alter wetland function by stimulating primary production and algal blooms (Valiela 1983; Coven and Zedler 1988). Zedler and Onuf (1984) argue a winter/spring pulse of dissolved inorganic nitrogen could be traced through successive trophic levels at Mugu Lagoon and thus play a major role in the functioning of Southern California systems. Page (1999) and Page *et al.* (1995) studied nutrient input in the

⁴² The study area includes a majority of these remaining wetlands.

Carpinteria Salt Marsh and found nitrate loading from watersheds (but not ammonium or phosphate) increased as a function of stream discharge. They also demonstrated the Carpinteria Salt Marsh exports nitrate and ammonium to the Santa Barbara Channel.

Community Involvement and Advisory Council Assessment

Community interest in the protection and improvement of water quality throughout the study area has been high throughout the management plan revision process. Since 1999, the Sanctuary Advisory Council has consistently identified water quality planning and protection as a priority issue of concern, repeatedly incorporating it into their annual work plan. As noted above, in 2005 the Advisory Council adopted a water quality needs assessment for the Sanctuary. This report is a good source of additional information about water quality threats and gaps in related monitoring, research, education, policies and regulations. The report did not suggest a crisis in general water quality conditions or with specific pollution sources. However, the assessment did recommend use of a proactive approach for protecting good water quality. The assessment finds that the Sanctuary is confronted with many types of anthropogenic pollution sources, over a large geographic range, and with dynamic magnitudes. These include:

- Nonpoint source pollution from the Channel Islands;
- Small vessel traffic in Sanctuary waters and the greater Santa Barbara Channel (SBC) region;
- Large vessel traffic (>300 gross tons) in the Sanctuary waters and the SBC region;
- Former ocean dumpsites;
- Ship and plane wreck sites;
- Offshore oil and gas production facilities within the SBC;
- Other point source discharges to the SBC (*e.g.* wastewater treatment facilities and cooling water effluents); and
- Nonpoint source pollution from the mainland.

This work and continued input from the Advisory Council and its working groups is integral to the development of Sanctuary programs and actions to address water quality issues.

Addressing the Issues – Strategies For This Action Plan

There are two strategies in the Water Quality Action Plan:

- WQ.1 – Offshore Water Quality Monitoring; and
- WQ.2 – Water Quality Protection Planning

These strategies address the need for CINMS to support and conduct sound monitoring for pollutants, identify pollutant sources, prioritize Sanctuary water quality threats, work closely with existing and new partners and water quality authorities, and develop and implement Sanctuary programs to address water quality concerns.

STRATEGY WQ.1 – OFFSHORE WATER QUALITY MONITORING

- *Objective:* To better evaluate and understand localized and large-scale spatial and temporal impacts from oceanographic and climatic changes and impacts from increases in human population in the coastal zone and subsequent pressure(s) on offshore marine resources.
- *Implementation:* Research and Monitoring staff

Background

State, county, city and NGO data collection efforts in the Southern California Bight (SCB) are heavily focused on coastal waters and streams. As an offshore site, CINMS is directing its efforts on the Santa Barbara Channel and the waters surrounding the Channel Islands to better evaluate and understand localized and large-scale spatial and temporal impacts from oceanographic and climatic changes (such as El Niño and La Niña events) and impacts from increases in human population in the coastal zone and subsequent pressure(s) on offshore marine resources. The water quality monitoring programs CINMS conducts address a range of water quality issues and impacts on the offshore resources of the Sanctuary. For example, one of the important goals of these efforts is to further understanding of stormwater plumes and how they may affect Sanctuary water quality and living resources.

CINMS currently supports and/or participates in several ongoing water quality data collection efforts, described below, and intends to do so on a long-term basis. In addition to collecting data, CINMS will support the processing, analysis and integration of additional relevant data for a better understanding of the dynamics of healthy functioning ecosystems and the biological implications of impacts on the resources. Statistically robust and relevant data sets will provide scientists with the ability to develop predictive models to better determine changes over time, allowing resource managers to be proactive instead of reactive to water quality impacts.

As mentioned in the Overview to this action plan, in 2005, CINMS partnered with Santa Barbara Channelkeeper to develop a pilot water quality monitoring project for the waters off of Santa Cruz and Anacapa islands. Goals of the pilot program were to: assess and identify suitable monitoring locations for longer term water quality assessment in the Sanctuary; collect water samples throughout the summer months in both high use and low uses areas, as well as areas supporting large marine mammal or seabird colonies; and analyze samples for bacterial indicators including total coliform, *Escherichia coli* (*E. coli*) and *Enterococcus*. The pilot program was a cooperative effort to better understand existing conditions and potential water quality issues associated with boating within the Sanctuary, especially at anchorages. From May to October 2005, Channelkeeper collected 35 samples from 14 locations around Santa Cruz and Anacapa Islands. Channelkeeper found indicator bacteria at several popular anchorages. Between May 2006 and May 2007, Channelkeeper processed a total of sixty water samples collected at thirty-two locations by Channelkeeper staff, along with UCSB researchers and commercial fishermen. Similar to the previous samples, in general Channelkeeper found levels of indicator bacteria to be non-detectable or very low at most sites, with a few exceptions. All samples fell below the state standards.

The next strategy focuses on water quality protection planning, but it also bears relevance to water quality monitoring. Through the course of implementing Strategy WQ.2 the Sanctuary will develop a water quality protection plan. In doing so, the Sanctuary and its partners will identify additional water quality monitoring needs. Such work has already been greatly assisted by the Sanctuary Advisory Council's 2005 report, *A Water Quality Needs Assessment for the Channel Islands National Marine Sanctuary*. However, as the Sanctuary has not yet completed a water quality protection plan, only current water quality monitoring activities supported by the Sanctuary are described in detail below.

Activities (3)

(1) Continue Support for Plumes and Blooms and Assess Management Implications. *Plumes and Blooms* is a study of the impacts of storm runoff on the marine environment of the Santa Barbara Channel. Part of an ongoing study, UCSB scientists are attempting to ground-truth SeaWiFS (Sea-Viewing Wide-Field-of-Vision Sensor) satellite acquired ocean-color data using the Sanctuary's vessel. One of the primary goals is to develop, apply and validate state-of-the-art tools for quantifying concentrations of suspended sediments, phytoplankton pigments and dissolved organic materials, using satellite ocean color imagery. *Plumes and Blooms* research provides valuable ocean color data for CINMS to better understand and manage freshwater and terrestrial inputs in the marine environment. CINMS is interested in better understanding the characteristics, dynamics and fate of large, storm-driven plumes emanating from the Ventura and Santa Clara Rivers, and the extent to which they could pose a threat to the Sanctuary's water quality and living resources.

The principal investigator for this project is UC Santa Barbara, with partnerships in NOAA, NASA, ONR, CSC and COP. Sanctuary staff will work with project leaders to appropriately incorporate *Plumes and Blooms* findings into water quality protection planning efforts (see Strategy WQ.2 below).

Status: CINMS vessel support ongoing since 1996, expected to continue aboard the R/V *Shearwater* on a competitive award basis for vessel time

Partners: UCSB; NASA; ONR; CSC; COP

(2) Continue Support for Southern California Bight Regional Monitoring Surveys. Bight '98 was a regional monitoring survey of the SCB coordinated by the Southern California Coastal Water Research Project (SCCWRP) to assess cumulative impacts of contaminant inputs and evaluate relative risks among different types of stresses. In 1998, more than 55 agencies coordinated efforts to sample 416 sites between the Mexican border and Point Conception. Multiple indicators were measured at each site to relate contaminant exposure, biological response, and habitat condition. Thirty-one trawl samples and thirty-seven benthic samples were collected off the Sanctuary's vessel at randomly selected sites in the Sanctuary. Useful comparative data about the relative health of the Sanctuary to the mainland coastal region were collected. A second survey was conducted in 2003, during which the same methods were used to gather additional data on the status of resources in the Southern California Bight. Sanctuary staff were also involved in planning for and field implementation of the Bight '08 project.

This research will assist the Sanctuary and other resource managers in answering questions about: 1) which areas do or do not meet water quality standards; 2) geographic distribution of impacts; 3) comparison of relative risk from point and nonpoint discharges; 4) the relationship between contaminant exposure and biological response; and 5) understanding historical trends at selected sites. The principal investigator for this project is the SCCWRP with partners including over 50 agencies and institutions.

Status: CINMS involvement and support began in 1998 (for Bight '98), continued in 2003 (for Bight '03), and 2008 (for Bight '08) and will continue as future projects are planned

Partners: SCCWRP as coordinator; over fifty other agencies and institutions

(3) Continue Support for CINMS Water Quality Monitoring Initiatives. Sanctuary staff, and partners from the Channel Islands Naturalist Corps, and Santa Barbara Channelkeeper are engaged in several ongoing water quality monitoring initiatives:

- Seakeeper Data Collection – In 2007 the NMSP outfitted the R/V *Shearwater* with a Seakeepers system that continuously monitors and records sea surface temperature, conductivity, dissolved

oxygen, pH, and Redox, as well as weather information and vessel position/status. The information is transmitted via satellite and Sanctuary staff can access it via web site. Data from this system will augment a variety of research and monitoring projects conducted aboard the *Shearwater*.

- Channel Islands Naturalist Corp (CINC) Data Collection – CINC volunteers collect water samples at various locations within and around CINMS and send them to the California Department of Health Services, where they are processed and become part of a biotoxin report on harmful algal blooms.
- Anchorage Data Collection – The Sanctuary has an ongoing partnership with Santa Barbara Channelkeeper, which collects and analyzes water quality samples and analysis from popular anchorages within the Park and Sanctuary.

Status: These projects and data collection have been operating since 2006/07

Partners: CINMS staff, Channel Islands Naturalist Corps, Santa Barbara Channelkeeper

STRATEGY WQ.2 – WATER QUALITY PROTECTION PLANNING

- *Objective:* To protect the chemical, physical and biological integrity of the Sanctuary by restoring and maintaining water quality.
- *Implementation:* Resource Protection staff

Background

This strategy will be implemented to protect the chemical, physical, and biological integrity of the Sanctuary by restoring and maintaining water quality. To do so, the Sanctuary, working with the NMSP West Coast Region and the Advisory Council, will 1) partner with local and state agencies and constituent groups in a comprehensive and coordinated effort for water quality protection and 2) better define the Sanctuary's role in water quality protection through policy development, research, and education. To accomplish these objectives the Sanctuary will use, to the extent appropriate, the existing Monterey Bay National Marine Sanctuary Water Quality Protection Program as a model (see www.montereybay.noaa.gov). The Sanctuary will also rely on assistance from the NMSP's West Coast Region to help build a water quality protection plan. The Sanctuary will also rely on the extensive research and documentation, and continued involvement, contributed by the Advisory Council and its working groups.

The Advisory Council's 2005 report, *A Water Quality Needs Assessment for the Channel Islands National Marine Sanctuary*, provides an important set of recommendations that will guide water quality protection planning efforts. As mentioned in the Water Quality Action Plan Overview, this report contains over twenty recommendations dealing with aspects of water quality such as: action planning; research and monitoring; jurisdiction, regulations, and policy; and public education and outreach. The report's recommendations are presented in Vol. I, Appendix E and will be instrumental for building a water quality protection program.

Activities (4)

(1) Complete Water Quality Characterization Report. In 2006, the NMSP West Coast Region and CINMS partnered with Santa Barbara Channelkeeper to develop a report characterizing water quality in the CINMS region. Finalizing this report is an important first step in the water quality protection planning process, as the report will provide an understanding of current water quality baseline conditions necessary to determine and prioritize current water quality threats. This baseline data will also be important to future water quality protection work as Sanctuary staff and partners can compare it against future data from water quality monitoring efforts described in Strategy WQ.1. Such comparisons may be used to help determine whether water quality protection efforts are having the desired effect, and to help determine when and how to adjust such efforts as necessary.

Status: To be completed by year 1

Partners: NMSP West Coast Region; Santa Barbara Channelkeeper

(2) Compile and Synthesize Information on Jurisdictional Water Quality Authorities and Responsibilities. Building on the Advisory Council's 2005 water quality needs assessment, Sanctuary staff will compile and synthesize information on jurisdictional water quality authorities and responsibilities as it pertains to water quality issues affecting the Sanctuary (including point source pollution and nonpoint source pollution, dredging, waste water management, HAZMAT response, freshwater flow, storm water permitting, etc.). This will also involve drafting descriptions of existing

agencies and management programs with responsibility for addressing water quality issues affecting the Sanctuary.

Status: To be completed by year 1

Partners: NMSP West Coast Region; Advisory Council; other regional water quality authorities and organizations

(3) Review State and Regional Water Quality Management. Work with interagency committees to evaluate and comment on management of existing and emerging water quality issues. Evaluate and develop recommendations on regional projects and permits that may impact Sanctuary water quality.

Status: Currently underway; expected to be implemented across years 1 through 5

Partners: Advisory Council; state and federal agencies; county agencies; NGOs

(4) Develop and Propose Priority Corrective Actions for Managing Sanctuary Water Quality Impacts. Building on the water quality characterization report described in activity (1) above, and the Advisory Council's 2005 water quality needs assessment (see also Vol. I, Appendix E), the Sanctuary will identify and prioritize water quality threats to Sanctuary resources, and identify needs and opportunities to coordinate and/or develop partnerships with existing authorities and interested public and private groups concerning improving Sanctuary water quality management efforts. CINMS will determine the need for and feasibility of implementing additional water quality management strategies using existing resources and programs, and ascertain the need for any additional resources to develop a Sanctuary water quality management program (to include grant proposals, public-private partnerships, volunteers, memoranda of agreement, etc.). This will also involve coordinating with Sanctuary education and outreach staff to determine water quality outreach needs. All planning activities will be based on significant input from and involvement by the Advisory Council and its working groups.

Status: Planning estimated to be complete by year 2 with implementation to follow

Partners: Sanctuary Advisory Council



Figure 44. Understanding links between regional terrestrial and marine systems is important to protecting Sanctuary water quality. (Brian D. Bresolin)

Table 9. Estimated Costs for the Water Quality Action Plan

Strategy	Estimated Annual Cost (in thousands)*					Total Estimated 5 Year Cost
	YR 1	YR 2	YR 3	YR 4	YR 5	
WQ.1: Offshore Water Quality Monitoring	\$15**	\$43**	\$43**	\$43**	\$43**	\$187**
WQ.2: Water Quality Protection Planning	\$20	\$20	\$20	\$20	\$20	\$100
Total Estimated Annual Cost	\$35	\$63	\$63	\$63	\$63	\$287

* Cost estimates exclude base budget funding requirements (salaries, overhead, etc.).

** Contributions from outside funding sources also anticipated.

Addressing the Issues – Strategies From Other Action Plans

In addition to the strategies identified in this Water Quality Action Plan, there are other strategies from other action plans either directly or indirectly addressing the issues associated with water quality:

- Strategy AU.1 – Education Program Development;
- Strategy CS.1 – Sanctuary Aerial Monitoring and Spatial Analysis Program;
- Strategy CS.8 – Automated Identification System (AIS) Vessel Tracking;
- Strategy EE.1 – Emergency Response Planning & Implementation; and
- Strategy RP.1 – Identifying & Assessing Current and Emerging Issues

Addressing the Issues – Regulations

Two Sanctuary regulations are directly associated with CINMS water quality issues. In summary these regulations prohibit:

- Discharging or depositing material or other matter, with exceptions related to fishing, vessels, military vessels, and lawful hydrocarbon activities; and
- Exploring for, developing, or producing hydrocarbons, with an exception for grandfathered leases (executed prior to March 30, 1981), and an exception for laying pipeline.

Sanctuary regulations are available at 15 CFR 922.70-922.74.

EMERGENCY RESPONSE & ENFORCEMENT ACTION PLAN

Overview

Effectively responding to hazardous spills or other emergencies and ensuring compliance with Sanctuary regulations requires a series of coordinated activities among multiple agencies, vessel and aircraft operations, and adequate staff and volunteer training. Utilizing these and other approaches, this action plan presents strategies and actions for addressing the Sanctuary's enforcement and emergency response needs.

Description of the Issues

The remote offshore location of CINMS presents challenges for enforcement of regulations and response to resource emergencies. While CINMS does not employ its own Sanctuary enforcement officers, Sanctuary regulations are enforced by NOAA's Office for Law Enforcement and via a series of agreements with other state and federal agencies. CINMS staff also work with other federal and state response agencies and resource trustees to ensure prompt and effective response to emergencies such as oil and hazardous substance spills, grounded or sunken vessels, vessel collisions, and downed aircraft. Such emergencies have the potential to injure Sanctuary resources, and may sometimes jeopardize human safety or involve loss of life.

Oil spills are a primary concern among many Sanctuary constituents, which is due in large part to the extent and history of oil and gas production in the Santa Barbara Channel (for one example of an oil spill in the Sanctuary region, see the text below on the 1969 Unocal platform blowout). Of the 79 active federal oil and gas leases off the coast of Southern California 43 are developed (producing; MMS 2008), 39 of which are in the Channel Islands region. Three lease units overlap the Sanctuary at its eastern boundary. Emergency response issues raised by Sanctuary constituents during scoping focused on oil and gas production:

- The Sanctuary should better evaluate the negative impacts from oil drilling, such as vessel strikes, pipe bursts and other accidents, and potential platform blowout;
- CINMS should evaluate and eliminate the potential for increased drilling in the Sanctuary (renewal of existing leases);
- CINMS regulations should be strengthened so that oil and gas activities continue to be prohibited in the Sanctuary; and
- CINMS should evaluate potential impacts of new leases on regional economies, such as fishing and tourism.

Emergency Response Issues

Oil and Hazardous Spills

Spills of oil or other hazardous materials in the Sanctuary and surrounding marine environment may come from a variety of vectors, including: accidents at oil and gas platforms, land-based accidents, and vessel and aircraft accidents. Spills from vessel accidents may result from vessel-to-vessel collisions, vessel collisions with oil and gas platforms or other stationary facilities, groundings, fires or explosions on board vessels, and aircraft crashes. The potential for spills from each of these vectors exists within the Sanctuary and its immediate surroundings due to: the close proximity of the Sanctuary to several oil rigs,

the overlap of three lease units with the Sanctuary, the close proximity of major air traffic flight paths, oil tanker traffic to the south of the islands, high use of the Sanctuary by recreational and commercial vessels, and the Sanctuary's close proximity to and overlap with major shipping lanes. Figure 45 shows the volume and number of hydrocarbon spills in the Pacific OCS Region due to oil and gas activities between 1969 and 1999.

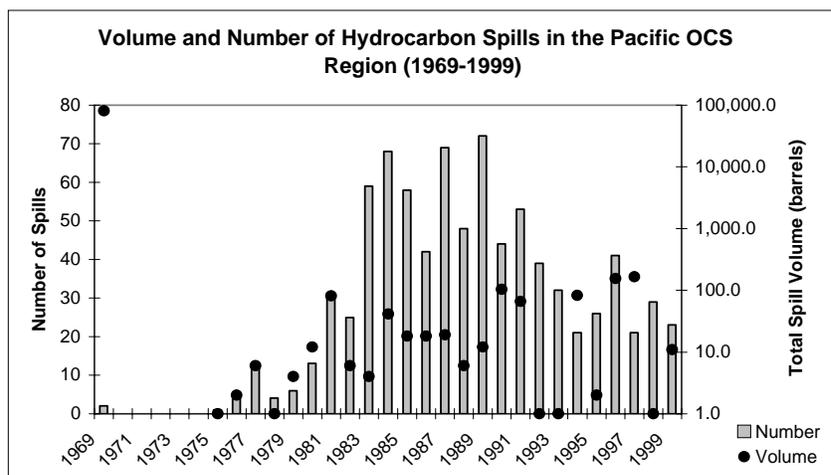


Figure 45. Volume and number of hydrocarbon spills in the Pacific OCS Region due to oil and gas activities between 1969 and 1999.

*Note: In years 1975, 1978, 1992, 1993, and 1998 the total volume of hydrocarbon spilled was greater than zero. It should be noted that there is also a large amount of natural hydrocarbon seepage in the Pacific OCS Region, particularly in the Santa Barbara Channel. However, hydrocarbons released by natural seepage are dispersed over large spatial and temporal scales, whereas spills due to oil and gas activities occur in concentrated amounts in small spatial and short temporal scales (County of Santa Barbara 2003).

Source: Minerals Management Service. 2001. Delineation Drilling Activities in Federal Waters Offshore Santa Barbara County, California. Department of the Interior, Minerals Management Service. EPA number: 010227D, 631 pages, June 18, 2001.

The impact of oil spills may be both physical and biological, and depends on the type of oil spilled and natural factors such as weather or current patterns that may spread the spill across a greater area. Oil spills caused by vessels or aircraft may include fuel oil, and/or cargo oil, while spills resulting from oil and gas platform accidents may include crude oil and other hydrocarbon products found in natural gas. Heavier petroleum products, such as crude oil and bunker fuel, last for a long duration but are less toxic than lighter hydrocarbons. Although most spilled crude oil initially floats, a percentage of the surface slick dissolves and penetrates the water column. Currents may then carry the slick onshore, fouling the coastline. In contrast, light petroleum products typically evaporate quickly but are more toxic.

Effects of oil on marine organisms vary with the extent and nature of exposure (*e.g.*, ingestion vs. external exposure), coincidence with activities such as feeding or breeding, the overall health of the affected animals, the species affected, and the type of oil (McCrary, Panzer, and Pierson 2003; County of Santa Barbara Energy Division 2002; Geraci and Aubin 1987; National Research Council 1985). Heavy crude oil tends to be very sticky, adhering to fur, feathers and skin. Volatile compounds in oil can burn eye, nose and mouth membranes of various marine organisms. Lighter hydrocarbons (*e.g.*, benzene, propane and toluene) may enter the bloodstream and damage red blood cells, immune system, liver, kidneys, spleen and the reproductive organs. In general, impacts may include disruption of normal feeding behavior, breeding and locomotion, reduced resistance to stress, toxic disease, loss of buoyancy, reproductive failure, and internal and external injury. Foraging seabirds may suffer contamination of feathers, which reduces flying and swimming ability, compromises buoyancy and thermal insulation, and often results in high mortality rates (McCrary, Panzer and Pierson 2003). Preening birds experience reproductive failure, unviable eggs or the transfer of oil to eggs or chicks from ingestion of toxic hydrocarbons. Diving birds, such as murres, guillemots, murrelets, loons, grebes and cormorants, are particularly susceptible to contact with oil given the additional exposure they receive when diving through the water column. Sea otters may suffer loss of buoyancy and thermal insulation (Laughlin 1994; Geraci and Aubin 1987; NRC 1985). Seals may be heavily oiled, compromising the insulating properties of their fur, leading to death through hypothermia. Whales may suffer from fouled baleen (impeding feeding ability), and oil collecting in their callosities (rough, cornified patches of skin) (Geraci and Aubin 1987; Geraci 1990). While animals in the water column may be able to avoid or exit areas impacted by oil, benthic marine organisms, especially those that are non-mobile, are highly susceptible. Internal injury to marine animals may also result from ingestion of oil during feeding, and/or grooming. Potential external injuries to animals may include skin and eye damage.

Effects of hazardous spills vary extensively depending on the nature of the hazardous agent involved (County of Santa Barbara Energy Division. 2002). A regional example of a hazardous spill is the case of

The Unocal Spill of 1969

The 1969 blowout and oil spill from Unocal's platform A in the Santa Barbara Channel received international attention (McCrary, Panzer and Pierson 2003; County of Santa Barbara Energy Division. 2002) and was a major catalyst in the development of modern environmental law in the United States and the designation of the Channel Islands National Marine Sanctuary (Cicin-Sain and Knecht 2000). The spill led to the spread of 200,000 gallons of crude oil into an 800 square mile slick.

Major oil spills can have devastating impacts on marine life (NRC 1985). Animals may ingest toxic quantities of hydrocarbons or may suffer other effects of contact or physical fouling. Sea otters and seals may be heavily oiled, compromising the insulating properties of their fur, and leading to death through hypothermia. When major spills impact areas populated by marine animals, dozens to thousands may be killed.

Reactions of migrating gray whales to the 1969 oil spill were not documented (Brownwell 1971), and no deaths were attributed to the effects of oil pollution (Reeves 1977). Six gray whale carcasses were recovered after the 1969 oil spill (Geraci 1990). Although the tally of dead whales was higher than recorded, researchers concluded that the higher counts were due to increased survey effort (Geraci 1990). The 1969 oil spill resulted in the loss of thousands of birds (McCrary, Panzer and Pierson 2003).

The 1969 spill influenced the passage of major state and federal legislation, such as the National Environmental Policy Act (NEPA), Federal Water Pollution Control Act (CWA), California Environmental Quality Act (CEQA), California Coastal Initiative in 1972 (Proposition 20), and California Coastal Act of 1976. Pursuant to these and other statutes, development permits for onshore or offshore oil and gas facilities may not be issued without provisions to protect terrestrial, marine, visual, recreational, and air resources.

the *Pacbaroness*, which collided with a car carrier off Point Conception in 1987 while carrying a toxic cargo of copper ore. This example is described in further detail in The Case of the *Pacbaroness* text box within the Water Quality Action Plan.

Other Emergency Response Issues

Aside from oil and hazardous spills, other emergency issues of concern to the Sanctuary result from vessel and aircraft accidents, and natural disasters. While vessel and aircraft accidents may be a source of hazardous materials and oil spills, they may also result in resource damages from impacts other than spills, as well as human safety threats and loss of life. Grounded vessels, and sunken vessels and aircraft may result in resource damage due to wildlife and habitat disturbance (*e.g.*, loss of benthic organisms due to abrasion from vessels grounded on rocky reefs). Although issues related to human safety and loss of life fall within the mandates of other agencies such as the U.S. Coast Guard, CINMS sometimes acts as a partner in responding to such emergency issues when they occur within or near the Sanctuary and Sanctuary resources such as aircraft and vessels, computer models, oceanographic data, and staff trained in first aid or paramedics may be of assistance. For example, CINMS staff aided in the search and salvage response efforts where Alaskan Airlines Flight 261 was lost off of Anacapa Island in February 2000.

Need for Coordinated Enforcement

Enforcement of CINMS and other resource agency regulations is essential for providing long-term protection to Sanctuary resources. As an offshore site, CINMS is a difficult area to patrol and enforce, requiring challenging use of available vessels, aircraft and other resources from among multiple agencies.

Sanctuary regulations are enforced through two principal means: the NOAA Office for Law Enforcement (OLE) and cooperative agreements allowing NOAA to deputize enforcement officers from other federal and state agencies. The Sanctuary currently has individual enforcement agreements with the U.S. Coast Guard, California Department of Fish and Game, and the National Park Service. In order to ensure coordinated and comprehensive law enforcement services around the Channel Islands, CINMS needs to continue playing a lead role in developing and updating these cooperative agreements among enforcement agencies.

Public Involvement in Sanctuary Stewardship

In addition to providing law enforcement of regulations, CINMS seeks to take an interpretive enforcement approach to informing the public and encouraging voluntary compliance. Interpretive enforcement is an enforcement strategy in which voluntary compliance and stewardship are stressed through educational messages and literature about responsible behavior. Because CINMS covers a vast area of open waters, the boating public can play an important role in helping to keep an eye on the Sanctuary, and, where appropriate, trained volunteers can assist in raising visitor awareness of the Sanctuary's regulations. To successfully and safely employ volunteers in this way, CINMS needs to provide leadership, training, and other support to develop an effective interpretive enforcement program.

Addressing the Issue – Strategies For This Action Plan

There are two strategies in the Emergency Response & Enforcement Action Plan:

- EE.1 – Emergency Response Planning & Implementation; and
- EE.2 – Expanding Enforcement Efforts

Each of these strategies is detailed below.

STRATEGY EE.1 – EMERGENCY RESPONSE PLANNING & IMPLEMENTATION

- *Objective:* To be prepared for response to oil spills, hazardous material spills, grounded vessels and natural or human initiated disasters.
- *Implementation:* Resource Protection staff

Background

CINMS staff will continue to develop an emergency response plan for oil spills, hazardous material spills, grounded vessels or natural disasters. The plan will be developed to link with the Incident Command System and the U.S. Coast Guard's Area Contingency Plan (ACP) and will strive to initiate a seamless operation in cooperation with various federal, state and local emergency response agencies in California including: NOAA HAZMAT; California Dept of Fish and Game, Office of Oil Spill Prevention and Response (OSPR); The U.S. Coast Guard; the California Office of Emergency Response (OES); and County and City government Emergency Response Offices. The Emergency Response Plan will be reviewed, evaluated and updated on an annual basis and volunteers will be trained to assist in the event of an emergency.

All CINMS response activity for any event large enough to activate the regional response system is coordinated through the ACP and activated Incident Command Center. The ACP is the "playbook" for emergency response. The ACP is basically a step by step instruction set taking responders through an event from initial notification through post event impact analysis and reporting. The ACP is a living document, and is reviewed and updated on an as-needed basis to ensure that all contact information and response resource inventories are always current. The ACP is available online at: http://www.dfg.ca.gov/ospr/organizational/scientific/acp/marine3/2005ACPs/2005LAACPs/laacp_index.htm.

The National Marine Sanctuary program has designed and utilizes innovative emergency response tools to increase response capabilities at CINMS and other national marine sanctuaries in responding to resource protection emergencies. Two of these tools are the Sanctuaries Hazardous Incident Emergency Logistics Database System (SHIELDS) and the Resources and Under Sea Threats (RUST) database. SHIELDS is a comprehensive web-based tool that, in the event of a resource emergency, provides Sanctuary and headquarters staff with immediate access to information about habitats and species at risk, any additional threats, resources available to help, notification contacts, maps and agency jurisdictions. RUST is included within SHIELDS and allows NMSP and CINMS staff to inventory and assess the relative threat of shipwrecks, pipelines, platforms, munitions, radioactive wastes, chemical warfare agents and industrial wastes.

CINMS provides aircraft, vessels, and trained response personnel as needed for emergency response events. Additionally, the Federal On-Scene Coordinator (FOSC), usually the U.S. Coast Guard in marine incidents, has full authority to bring any resources in from anywhere in the country to respond to an event, thus ensuring national resources are available to protect the CINMS. The ACP provides information about how the FOSC is designated for each incident.

Activities (5)

(1) Identify Specific Emergency Response Duties for CINMS Staff. Staff are trained in the Incident Command System, the area contingency plan, emergency response duties, emergency response drills and resource damage assessment skills. Training is ongoing, with regular updates and refresher courses.

Status: Existing project; training is ongoing and will continue at appropriate intervals through years 1-5

Partners: USCG; NOAA HAZMAT; CDFG-OSPR; California OES; regional oil companies; other regional authorities

(2) Implement SHIELDS and RUST. CINMS staff will continue to work with NMSP headquarters on implementing and improving the various aspects of both the SHIELDS and RUST initiatives (see description above). CINMS staff has received training on both of these emergency response tools and will receive additional training as it is made available.



Figure 46. Grounded or sunken vessels may release harmful substances such as fuel and oil into the environment, as at this site of a sunken fishing vessel off of Santa Rosa Island, 2003. (CINMS)

Status: Project began in 2003; implementation and training will continue across year 1 through 5

Partners: NOAA HAZMAT, USCG, CDFG-OSPR

(3) Train Additional Emergency Response Volunteers. Volunteers will be provided training on hazardous waste operations and emergency response (HAZWOPR) procedures, as well as shoreline cleanup and assessment techniques, to be readied for service by the end of year three. In the event of a spill or other resource emergency, these volunteers would be located at affected coastal and island shorelines to inventory impacts on living marine resources and habitats during and after an incident.

Status: Implementation by year 3

Partners: USCG; NOAA HAZMAT; CDFG-OSPR

(4) Develop an Emergency Response Manual. CINMS will develop a manual containing a site safety plan checklist, responsibilities of CINMS staff, command, operations, planning, logistics and a glossary of terms.

Status: Existing project; updated manual completed by year two

Partners: U.S. Coast Guard; NOAA HAZMAT; CDFG-OSPR

(5) Develop a Modeling Program as Part of SAMSAP to Assist in Emergency Response and Assessment. Using Global Positioning Satellite (GPS), modified survey software and Geographical Information System (GIS), CINMS can now plot a spill's perimeter and endangered resources and transmit findings and produce color maps and GIS data output immediately after landing. CINMS is currently updating the SAMSAP software to include modules specific to emergency response use. The next phase of this program includes the acquisition of additional data to input into a model for real-time analysis for increased accuracy of trajectory models. In addition, CINMS would like to make these capabilities available for vessel use.

Status: Implementation began in 1998; next phase implemented by year 2

Partners: Internal

STRATEGY EE.2 – EXPANDING ENFORCEMENT EFFORTS

- *Objective:* To promote resource protection through compliance with Sanctuary regulations and other applicable state and federal statutes and regulations.
- *Implementation:* Resource Protection staff

Background

The objective of this strategy is to promote resource protection through compliance with Sanctuary regulations and other applicable state and federal statutes and regulations. The mission of Sanctuary enforcement is to ensure compliance with the NMSA and Sanctuary regulations. Section 307 of the NMSA authorizes the Secretary of Commerce to conduct activities for enforcing the act, delineates civil penalties and powers of authorized officers, and provides for recovery of penalties by the Secretary. The CINMS enforcement program will achieve its goals through: 1) the use of interpretive enforcement⁴³ as a means to inform the public and encourage voluntary compliance with Sanctuary regulations and 2) the active enforcement of the NMSA and CINMS regulations. Together, these approaches should result in a regular and ongoing enforcement presence in Sanctuary waters and compliance with Sanctuary regulations.

Activities (3)

(1) Plan and Implement Interpretive Enforcement Via Sanctuary Marine Watch (Team OCEAN).

Team OCEAN (Ocean Conservation Education Action Network), a volunteer-based, peer education program will conduct outreach and interpretation activities to affect behavior and values to achieve voluntary compliance with Sanctuary regulations. Volunteers will impart information about Sanctuary resources, the purpose of Sanctuary regulations, the benefits of protection and the potential impact of activities on the environment. Additional information on Team OCEAN can be found in Strategy AU.3 of the Public Awareness & Understanding Action Plan.

Status: Initial planning efforts began in 2002, implementation of pilot project planned for year 2 or 3 with full implementation to follow

Partners: Volunteer participants

(2) Maintain Effective Vessel and Aircraft Surveillance Operations. The law enforcement component of this strategy includes both aerial and ship-based patrols. Weather permitting, the Sanctuary Aerial Monitoring and Spatial Analysis Program (SAMSAP) performs simultaneous data collection and enforcement surveillance on a weekly basis in the Sanctuary. Using NOAA, partner, and contract aircraft as platforms, SAMSAP tracks visitor use and compliance using its aerial vantage point (see Strategy CS.1) while ship-based patrols are carried out by the Sanctuary's vessel. In addition, CINMS will maintain an active enforcement relationship with the USCG and the Civil Aeronautical Patrol. Additionally, CINMS is increasing its surveillance and enforcement capabilities through the automated identification system described in Strategy CS.8 - Automated Identification System (AIS) Vessel Tracking.

Status: Began in 1998; MPA network surveillance started in 2003; continued operations planned throughout years 1 through 5

⁴³ Interpretive enforcement is an enforcement strategy in which voluntary compliance and stewardship are stressed through educational messages and literature on responsible behavior.

Partners: Civil Aeronautical Patrol; CA Department of Fish and Game; Channel Islands National Park; NOAA Fisheries – Office for Law Enforcement; U.S. Coast Guard

(3) Cross-Deputize Other Regional Enforcement Personnel. Partnerships with state and federal agencies are vital to a successful enforcement program. To ensure sufficient patrol presence in the Sanctuary, various interagency agreements have been developed or are under development by CINMS and NOAA’s Office for Law Enforcement. Such partnerships provide for the cross-deputization of officers with the CDFG and CINP.

Status: Some agreements already in place; complete implementation by year 2 (or sooner) and maintain thereafter

Partners: CA Department of Fish and Game; Channel Islands National Park; NOAA Fisheries – Office for Law Enforcement; U.S. Coast Guard



Figure 47. CINMS staff onboard the CDFG enforcement vessel *Swordfish*.
(Robert Schwemmer)

Table 10. Estimated Costs for the Emergency Response & Enforcement Action Plan

Strategy	Estimated Annual Cost (in thousands)*					Total Estimated 5 Year Cost
	YR 1	YR 2	YR 3	YR 4	YR 5	
EE.1: Emergency Response Planning & Implementation	\$14	\$23	\$23	\$14	\$14	\$88
EE.2: Expanding Enforcement Efforts	\$24**	\$16.5**	\$16.5**	\$16.5**	\$90**	\$163.5**
Total Estimated Annual Cost	\$38	\$39.5	\$39.5	\$30.5	\$104	\$251.5

* Cost estimates exclude base budget funding requirements (salaries, overhead, etc.).

** Includes funds expected from the National Marine Sanctuary Program.

Addressing the Issues – Strategies From Other Action Plans

In addition to the strategies identified in this Emergency Response & Enforcement Action Plan, there are several strategies from other action plans either directly or indirectly addressing the issues associated with responding to emergencies and enforcing Sanctuary regulations:

- Strategy AU.3 – Team OCEAN;
- Strategy AU.4 – Developing Outreach Technology;
- Strategy AU.8 – MPA Network Education;
- Strategy CS.1 – Sanctuary Aerial Monitoring and Spatial Analysis Program;
- Strategy OP.2 – Permitting and Activity Tracking;
- Strategy OP.3 – Relationships With Other Authorities; and
- Strategy OP.4 – Vehicle, Boat & Aircraft Operations

Addressing the Issues – Regulations

Strategy EE.2 (Expanding Enforcement Efforts) is related to the provision of law enforcement for all Sanctuary regulations. Sanctuary regulations are available at 15 CFR 922.70-922.74.

MARITIME HERITAGE ACTION PLAN

Overview

Maritime heritage resources (MHRs) of the Sanctuary may represent as much as 13,000 years of human history. These resources consist of Chumash Native American artifacts, paleontological remains, shipwrecks, aircraft wrecks, and material associated with wharves, piers and landings. MHRs are typically divided into two categories: 1) cultural, consisting of Chumash Native American artifacts and 2) historic, consisting of artifacts from non-Native American cultures.

Currently known cultural material in the Sanctuary dates as far back as 13,000 years while historic materials span history from the time of Juan Rodriguez Cabrillo's voyage (1542 to 1543) up to the mid-20th century. In addition, the Sanctuary likely contains submerged paleontological remains. Collectively, Sanctuary MHRs represent a remarkable cross-section of our regional and national heritage. Note that sanctuary regulations (15 CFR 922.3) indicate that "historical resource means any resource 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." The cultural maritime heritage of the Sanctuary is also embodied by the contemporary Chumash community, with whom the Sanctuary has worked and continues to work closely to promote public education of Chumash history and culture as well as to assist in a Sanctuary-related indigenous maritime culture revitalization among regional Chumash communities.



Figure 48. In 1997, Chumash Maritime Association launched 'Elye'wun, a traditional tomol. (CINMS)

Launched in 2002, the NMSP's Maritime Heritage Program has made great strides toward meeting the mandates of the National Marine Sanctuaries Act and the goals of President Bush's Preserve America Executive Order. The program has successfully worked in partnership with numerous government agencies and private groups to locate, document, inventory, and/or protect more than a dozen historically significant shipwrecks, from the famed Civil War ironclad USS Monitor to the 19th century steamer Portland, known as "New England's Titanic." Also, the program distributes mini-grants aimed at discovering, exploring, preserving, and protecting maritime heritage in the sanctuaries. In 2007, NOAA opened the Maritime Archaeology Center in Newport News, Virginia to serve as a central coordination point for the protection of cultural resources within national marine sanctuaries. CINMS staff play an integral role in the Maritime Heritage Program, which will be a critical component to the continued success and growth of the CINMS Maritime Heritage Program and the accomplishment of strategies and actions presented in this action plan.

Description of the Issues

The history of California's northern Channel Islands and its contiguous waters is predominantly a maritime one. From the days of ancestral Chumash inhabitants up to the time of their forced removal from the Islands, to more recent times of Euro-American island commerce, and now serving as a major waterway for coastal and international shipping, the history until recently has been known by only a small number of people. Although the sport diving community frequently visits the Sanctuary for recreation, knowledge of the region's maritime heritage and the protected status of its submerged resources is generally unknown. The same is true for the non-diving public who visit the islands and local community visitor attractions along the central coast. The Santa Barbara region alone receives over eight million annual visitors. Public understanding of the national and regional significance of Sanctuary maritime resources will not only enhance visitor experiences, it is essential for the protection of the resources for present and future generations. In addition to enhancing the need for public awareness about the region's Chumash cultural and historic maritime heritage, opportunities exist for the public to participate in the important role as stewards for the protection of these resources. The NMSP and NMSA provide through its educational and outreach provisions the opportunity to enhance public appreciation of this special region.

To gain a better understanding of the past, researchers strive to study MHRs in their original context. The relationship of one artifact to another is important and if an artifact is moved or altered, it can affect the way researchers understand and interpret an MHR site.

There are two principal threats to submerged cultural and historic resources: human behavior and natural phenomena. While little can be done to minimize the injury from natural events (with the exception of removing delicate artifacts for conservation and research), human behavior may be managed through education, adequate regulations and effective enforcement. Evaluating the threats to submerged cultural and historic resources in the Sanctuary requires further research because so few sites have been located and thoroughly surveyed. As such, NOAA recognizes the removal of cultural or historic artifacts is sometimes necessary. The following are reasons that may necessitate removing artifacts:

- To protect artifacts from harsh environments;
- To conduct research helping to educate the public;
- To make the artifacts more accessible to the public; and
- To improve the scientific understanding of the Sanctuary environment through research.

With respect to the recovery of Chumash artifacts, an issue of concern is the proper handling of that activity in consultation with Chumash tribal and other organizations. This issue is addressed in Strategy MH.4.

Human Threats

Site looting (where objects are intentionally pilfered from submerged sites) may pose a major threat to submerged archeological resources. This act has the potential to be more injuring than controlled salvage since it is an act of wanton destruction and theft. Artifacts that are small and light enough for divers to carry are pilfered most often. Larger structures of shipwrecks are less likely to be stolen, but may be vandalized, intentionally defaced, or destroyed in search of recoverable artifacts. Most events go unnoticed, while some cases occurring in the Sanctuary have been documented with evidence for successful prosecution.

Sometimes through the process of recovery, important archaeological contexts are destroyed. Attempted conservation by over-zealous cleaning may remove important evidence about the artifact, its use and the associated site, or destroy the protective coatings enabling it to survive in the first place. Some artifacts are discarded when they are found to have little or no monetary value and/or the novelty of discovery has worn off, while others are neglected and allowed to fall into decay (Robinson 1998).

Divers who may not have any intentions to loot or vandalize artifacts may still cause injury through poor diving techniques or tampering. Divers may inadvertently injure resources by kicking up sand from the bottom, holding onto artifacts or accidentally breaking fragile resources when striking them with scuba tanks. Even if the intent was not to steal or damage the resources, permanent destruction to non-renewable artifacts can be inflicted.

Vessel activity can also cause serious injury to submerged archaeological resources. An anchor dropped on an artifact can seriously and permanently injure it or drag it away from the context of its original site location. Seabed disturbance by mobile bottom fishing gear has emerged as a concern due to the injurious effects of heavy trawl doors and nets dragging through archaeological sites.

Modern ship groundings can have seriously impacted archaeological resources in various sites worldwide. A large vessel grounding on an archaeological site may destroy and permanently bury historic artifacts under tons of modern steel and debris. The impacts of oil spills from bunker fuels and petroleum cargoes covering historical resources have largely been overlooked. Sinking petroleum products can physically smother resources. Due to the increase in carbon, oil contamination from a modern shipwreck may also impede the radiocarbon dating processes.

Loss of the Winfield Scott

The Winfield Scott departed San Francisco upon its last voyage on 1 December 1853, with a full load of passengers and a shipment of gold bullion. Selecting the Santa Barbara Channel rather than a passage outside the islands in an effort to save time, Captain Simon F. Blunt entered the passage as a fog developed. Evidently intending to steam between Anacapa and Santa Cruz islands the Winfield Scott piled into Middle Anacapa Island at full speed, probably around 10 knots, at eleven o'clock that evening. Amid general confusion, a boat was launched and located a nearby land place. The entire ship's company, more than 300 persons, left the vessel that evening for a small pinnacle 200 yards offshore from Anacapa Island. The following morning, the ship's boats transferred the group to the island proper. There a temporary camp sheltered most of the group for the next week. The majority of the passengers left on December 10, when the California plucked them from the beach and took them on their way to Panama. The ship's company remained on the island for two more days, concentrating on recovery of the mail and baggage carried aboard. They also recovered some furniture and "small portions of machinery." Other salvors removed foodstuffs and other items. Captain Horatio Gates Trussell of Santa Barbara salvaged wood that became incorporated into the home now preserved as the Trussell-Winchester Adobe, which also contains two brass thresholds from the ship.



The process of trenching communications cables can have permanently damaging effects to submerged archaeological resources during grappling and (sea) cable installation. To mitigate such a threat, qualified archaeologists are required to conduct archaeological resources inventories and avoidance plans with supervised magnetometer and side-scan surveys of the proposed regions.

The laying of oil pipelines and other structures supporting offshore oil and gas processing facilities can destroy cultural and historic resources. Dredging operations to clear harbor entrances can destroy and/or dislodge submerged archaeological resources, thus losing important clues to their history.

Natural Threats

Although there is little that can be done to protect artifacts from natural processes, the Sanctuary recognizes these threats and, when possible, will attempt to mitigate their impacts, or when necessary remove “at risk” items as part of the Shipwreck Reconnaissance Program. Most injury to shipwrecks occurs in the first few decades of their sinking. Sanctuary staff have observed shipwrecks tend to stabilize with the environment (sustaining fewer injurious effects) after twenty or thirty years.

Shipwrecks in shallow water environments within higher energy zones are much more likely to be subjected to injury by waves, shifting sands and strong currents. Wave action carries a tremendous amount of energy that can easily break up a shipwreck and physically pull it apart; whereas shipwrecks in deeper and calmer waters are generally in a more stable environment (limiting physical effects). Cold and deep-water environments tend to have fewer biological processes accelerating ship degradation as that found in shallower sites.

Shipworms (*Teredo diegensis*) inhabit and burrow through wood material, rapidly destroying its structure. Evidence of these shipworms is common among wooden shipwrecks in the Sanctuary. Sea urchins secrete acid that dissolves small, cup-shaped depressions into rocky reef ledges. Creatures living on the surface of historical resources also have the potential to inflict damage. Rock-boring clams, tubeworms and other organisms can have destructive results, even on stone artifacts.

Raising Public Awareness

Public awareness is a key for a better understanding and protection of the unique MHRs of the Sanctuary. With additional MHR knowledge visitors to the Sanctuary can enjoy their experience while mitigating impacts to these resources and potentially engaging in a stewardship role. Visitors to regional learning centers will also be informed of the region’s maritime heritage and the role of the Sanctuary Program in protecting and managing these resources.

Contemporary Chumash Native American Culture

The Sanctuary has a history of working closely with the Chumash community in supporting their cultural revitalization as well as in teaching others about Chumash culture as it relates to the ocean and the Sanctuary. For example, the Sanctuary helped fund the construction of a *tomol* (a traditional Chumash plank canoe) in 1996 and, since 2001, has regularly provided support and assistance during historic *tomol* Channel crossings to the Channel Islands. In 2004 CINMS added a Chumash Community seat to the Sanctuary Advisory Council and has continued to help institute a related Chumash Community Working Group. In partnership with this important community, much remains to be done to bring a fuller understanding in the promotion of educating the public about the unique spiritual and cultural relationship of the Chumash to Sanctuary waters, from ancestral times to the present. In addition, such a partnership can assist Chumash people to make a complete reconnection with their maritime heritage, including involvement in Sanctuary management.

Addressing the Issues – Strategies For This Action Plan

With the development of underwater technologies bringing the public physically and virtually closer to the marine environment, there is increasing interest in the protection of MHRs. Management of these historically significant resources can provide the public with a variety of education, research, and recreation opportunities. The continuing discovery, exploration, documentation, and study of these resources provide a richer understanding of the region's maritime community, which is an important component of the larger ecosystem CINMS is protecting. MHRs provide an excellent historical record to past human behavior patterns and uses in the Sanctuary.

Submerged maritime heritage resources are subject to irreversible injury and can be severely compromised by human and environmental impacts. Although the Sanctuary allows certain compatible activities, it must assess multiple use against the over-riding responsibility for protecting both maritime heritage resources and natural resources for current and future generations.

With the Maritime Heritage Action Plan, CINMS will continue to inventory, monitor and protect these archaeological resources. The public will be engaged and informed through volunteer efforts, exhibits and access through Website technologies. Partnerships with Chumash tribal groups, organizations, and individual community members will be fostered to further goals of the program.

There are six strategies designated for this Maritime Heritage Action Plan:

- Strategy MH.1 – The Shipwreck Reconnaissance Program;
- Strategy MH.2 –MHR Volunteer Program;
- Strategy MH.3 – Partnering With the Santa Barbara Maritime Museum;
- Strategy MH.4 – Implementing a Coordinated MHR Protection Outreach Effort;
- Strategy MH.5 – Upgrading the Maritime Heritage Website; and
- Strategy MH.6 – Supporting Public Education of Chumash Native American Maritime Heritage

STRATEGY MH.1 – THE SHIPWRECK RECONNAISSANCE PROGRAM

- *Objective:* To contribute to scientific knowledge and enhancement of management practices related to underwater historical resources by encouraging research and monitoring efforts.
- *Implementation:* Maritime Heritage staff

Background

The NMSP adheres to the Federal Archaeology Program as established by the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470f). Federal agencies with land management responsibilities for public lands must inventory their holdings (Sec. 110) and ensure mitigation of any federally funded activities threatening historical and cultural resources on those lands (Sec. 106). In 1971, Executive Order 11593 required all agencies create programs to facilitate the protection of cultural resources on protected lands. The Shipwreck Reconnaissance Program contributes to scientific knowledge and enhancement of management practices related to underwater archaeological resources by encouraging research and monitoring efforts.

Activities (3)

(1) Maintain the CINMS MHR Inventory. A comprehensive inventory of MHRs began at the time of CINMS' designation in 1980 and continues today. To date, 30 of the 140 known historic sites in the Sanctuary have been recorded. The inventory process includes: 1) literature searches of secondary and primary source documentation; 2) interviews with local sport and commercial diving/fishing communities and local residents; 3) field searches to locate probable submerged sites; 4) systematic recording of submerged sites establishing site maps, still photography and videography; 5) monitoring sites for new discoveries and evaluation of human disturbance; 6) identifying partners to perform research and field studies for publication; 7) presentation of findings to the public and scientific community; 8) conversion of site maps to GIS format; and 9) evaluation of sites for National Register of Historic Places (NRHP) designation.

Status: Implemented 1980; remains an ongoing project to be conducted annually

Partners: Channel Islands National Park and CMAR

(2) Continue Year-Round Monitoring of Known Sites. Utilizing federally certified scuba divers, the Shipwreck Reconnaissance Program provides year-round monitoring of submerged sites. Periodically emergent beach shipwrecks are viewed during routine SAMSAP flights. To date, major submerged archaeological sites have been recorded within recreational diving depths. Through a cooperative partnership, the program has qualified archaeologists to oversee field studies. Underwater artifacts are recorded and mapped providing archaeologists with an accurate reconstruction of sites. To augment field studies, archival research is conducted which broadens the historical context of each site. CINMS and CINP, working with Coastal Maritime Archaeology Resources (CMAR) personnel, are prepared to respond and investigate new discoveries on short notice. The response team mitigates possible injury to sites and can provide emergency documentation and recovery for artifacts at risk. To secure "at risk" artifacts, CINMS has established a system for conserving, cataloging, displaying and curating items through the Santa Barbara Maritime Museum and State of California. Over the next 5 years, the Sanctuary would like to employ deep-water technology, such as remotely operated vehicles (ROVs) or manned submersibles to investigate sites at greater depths.

Status: Implemented 1997; remains an ongoing project to be conducted annually

Partners: CINP; CMAR; SBMM; CSLC

(3) Produce Various MHR-Focused Outreach Materials. Such materials include underwater site maps of selected shipwreck sites, such as: 1) artifact identification for public use; 2) an updated and reprinted Shipwrecks of The Channel Islands brochure; 3) documentation on qualifying sites for nomination to the National Register of Historic Places; 4) CINMS Maritime Heritage Resources brochure; 5) an expanded CINMS maritime heritage website, including shipwreck database curriculum; and 6) a published assessment of the current status of CINMS MHRs.

Status: Ongoing function since designation; several upgraded products and web offerings since 2000; additional materials produced from years 2 through 5

Partners: Internal

STRATEGY MH.2 – MHR VOLUNTEER PROGRAM

- *Objective:* To provide an opportunity for individuals most interested in maritime heritage resource protection to become stewards and representatives of the CINMS.
- *Implementation:* Maritime Heritage staff

Background

CINMS looks to the community for providing additional expertise and assistance in recording and inventorying MHRs. The Maritime Heritage Resource Volunteer Program provides an opportunity for individuals most interested in maritime heritage resource protection to become stewards and representatives of the Sanctuary. This program engages the public in the management and protection of resources, allowing individuals to participate in research and interface with the public in presenting discoveries.

The Shipwreck Reconnaissance Program success is due in part to its partnership with Coastal Maritime Archaeology Resources (CMAR), an avocational archaeological organization. Through volunteer efforts, this team of qualified historians and avocational archaeologists has successfully recorded several submerged sites in the Sanctuary. Beyond archival research and recording of sites, CMAR volunteers will present their findings in both academic and professional settings as well as to the public.

Activities (3)

(1) Work With Volunteers in the Production of Waterproof Shipwreck Maps. CMAR members have years of experience in recording and developing underwater site maps. Upon completion of recording artifacts in the field, the information is transformed into Design CAD computer software for use in Arch View GIS applications and supports the production of waterproof slate imagery.

Status: Ongoing partnership; Implementation of first slates by year 3

Partners: CMAR; Santa Barbara Maritime Museum

(2) Support Volunteer Photo and Video Documentation of Sites. The annual recording and monitoring of underwater sites of historic significance is an important process in establishing a baseline of site conditions and documenting future changes brought on by environmental or human impact. CMAR members utilizing CINMS and CINP underwater video equipment help document established monitoring stations at designated sites.

Status: Ongoing activity to continue in years 1 through 5

Partners: CMAR; CINP; State of California

(3) Support Volunteers in the Production of Annual MHR Reconnaissance Reports. Upon completion of each Field Reconnaissance Expedition to record submerged resources in the Sanctuary, reports documenting site conditions require processing. CMAR provides invaluable site evaluation and documentation included in the production of the reports.

Status: Ongoing activity to continue in years 1 through 5

Partners: CMAR, CINP

STRATEGY MH.3 – PARTNERING WITH THE SANTA BARBARA MARITIME MUSEUM

- **Objective:** To promote the stewardship role of CINMS, Channel Islands National Park and the State of California in providing research, developing public awareness, overseeing visitor use and protecting MHRs.
- **Implementation:** Maritime Heritage staff

Background

The recently opened Santa Barbara Maritime Museum (SBMM) anticipates 100,000 local, national and international visitors each year. CINMS has accepted an opportunity to partner with the SBMM to create interactive exhibits providing museum visitors with a hands-on approach to learning about the Sanctuary's maritime heritage.

CINMS and SBMM are developing exhibits featuring shipwrecks of the Sanctuary and NOAA has agreed to provide Procurement, Acquisition, and Construction (PAC) funding for exhibit development. Exhibits will explain the stewardship role of CINMS, Channel Islands National Park and the State of California in providing research, developing public awareness, overseeing visitor use, and protecting MHRs. In addition to permanent shipwreck exhibits, Sanctuary staff will participate in an ongoing lecture series at the museum.

Activities (3)

(1) Maintain and Update the NOAA Exhibit. This exhibit provides information pertaining to the role and responsibility of the Sanctuary, the National Park and the State of California in protecting MHRs. The exhibit includes images of Native American Chumash watercraft, field research, historic research, and a video presentation on the Shipwreck Reconnaissance Program.

Status: Phase 1 installed in 2000, future maintenance and upgrades as necessary

Partners: Santa Barbara Maritime Museum; CMAR; CINP; Chumash Community Working Group and other Chumash groups as appropriate

(2) Maintain the Winfield Scott Exhibit. The *Winfield Scott* Shipwreck Exhibit tells the story of the California gold rush-era, side-wheel steamer *Winfield Scott*, which was stranded on Anacapa Island in 1853 with over 400 passengers onboard. The steamer's history and marooning is presented by survivors' first-person accounts.

Status: Install in December 2005, future maintenance and upgrades as necessary

Partners: SBMM; CMAR; CINP

(3) Maintain the Central California and Channel Islands Shipwrecks Exhibit. The Central Coast and Channel Islands Shipwrecks Exhibit will highlight individual shipwrecks and tell the story of how hundreds of shipwrecks have been lost in the region. The historic profiles of each shipwreck will include contemporary shipwreck images, modern underwater images and historic artifacts.

Status: Exhibit planned for 2007, future maintenance and upgrades as necessary

Partners: SBMM; CMAR; CINP

STRATEGY MH.4 – IMPLEMENTING A COORDINATED MHR PROTECTION OUTREACH EFFORT

- *Objective:* To enhance the quality of visitor use and avoid injury to archaeological resources.
- *Implementation:* Maritime Heritage, Resource Protection, and Education and Outreach staff

Background

This strategy seeks to enhance the quality of visitor usage and avoid injury to archaeological resources by consulting with representatives of the Chumash community about protection of Chumash artifacts, and providing divers with interpretive information on shipwrecks. In the event that Chumash artifacts are discovered within the Sanctuary, Sanctuary staff should determine the legal and best course of action for protection of such artifacts. This necessitates consulting and partnering with the appropriate entities, including Chumash representatives, the Channel Islands National Park, the California State Lands Commission and Office of Historic Preservation, and others. In order to avoid injury to other archaeological resources, namely shipwrecks, the Sanctuary is developing a coordinated outreach effort to make contact with the sport and commercial diving communities through printed materials, presentations, and diving aids. Important points of contact when reaching out to these diving communities include dive clubs, dive shops, and commercial dive boat operators.

Activities (3)

(1) Clarify and Enhance Practices Regarding Protection and Handling of Chumash Artifacts. The Sanctuary will consult with the Sanctuary Advisory Council and ask for the assistance of its Chumash Community Working Group in clarifying existing requirements and discussing best management practices regarding protection and handling of Chumash artifacts, including necessary and/or recommended Chumash monitoring or other involvement.

Status: Request working group assistance in year 1; implementation ongoing as needed thereafter

Partners: Sanctuary Advisory Council and Chumash Community Working Group; relevant state and federal agencies

(2) Create and Distribute Shipwreck Interpretive Underwater Slates. Slates will contain underwater maps, descriptions of significant artifacts, historical profiles of vessel history and loss, and information on location, depth, relevant regulations, and dive protocol.

Status: Slates produced and in use by year 3

Partners: Internal

(3) Create and Distribute Video of CINMS Shipwrecks. This interpretive video will feature *Shipwrecks of The Channel Islands* and will be distributed to local dive shops, dive clubs and commercial dive boat operators.

Status: Video produced and distributed by year 3

Partners: Internal

STRATEGY MH.5 – UPGRADING THE MARITIME HERITAGE WEBSITE

- *Objective:* To promote understanding of, appreciation for and involvement in the protection and stewardship of maritime heritage to a wide spectrum of the public
- *Implementation:* Maritime Heritage staff

Background

The current CINMS maritime heritage website hosts an overview of Chumash history and selected historic shipwrecks. Upgrading the website will promote public understanding of, appreciation for, and involvement in the protection and stewardship of MHRs targeting to students, educators, researchers and sport divers. This strategy calls for development of a dynamic website emphasizing recent discoveries and real-time uplinks to current events.

The website will include interactive features such as live underwater uplinks from field sites, living journals of students and researchers, and TV uplinks of maritime heritage lectures. Electronic versions of all maritime heritage resource printed materials, such as the *Shipwrecks of the Channel Islands* brochure and the *CINMS Maritime Heritage Resource Assessment* publication may be downloaded from the website. Shipwreck site information will be available including maps, vessel histories, artifact descriptions and historic images. SBMM shipwreck exhibit information will also be on the website.

Activities (3)

(1) Incorporate SBMM Exhibits Into the Website. Images of the shipwreck exhibits and the stories they tell can provide an interactive experience for visitors to the CINMS maritime heritage website. Several of the exhibits will include underwater video footage recorded at the shipwreck sites that can be incorporated onto the CINMS maritime heritage website.

Status: Significant website updates in 2003; more to follow across years 1-5

Partners: Internal

(2) Incorporate Shipwreck Profiles and Site Maps Into the Website. Providing lesson plans online allows students from several different schools across the nation to access the curriculum any time of day. A “West Coast Shipwreck Database” curriculum was established to raise public awareness about the importance and value of historic shipwrecks. This website will serve the diving community by providing underwater site maps, artifact descriptions, regulations, and diver protocol for visiting MHR sites.

Status: Significant website updates in 2003; more to follow across years 1-5

Partners: CMAR; CINP; State of California

(3) Incorporate “Living Journals” Into the Website. The CINMS maritime heritage website will feature visitors’ recollections after visiting the Sanctuary’s MHRs. The West Coast Shipwreck Database, in addition to providing an online curriculum, will assist families searching for information about shipwrecked vessels their relatives may once have served on. Family members are encouraged to share with the public their living journals associated with the shipwreck histories for dissemination on the maritime heritage website.

Status: Significant website updates in 2003; more to follow across years 1-5

Partners: Various authors

STRATEGY MH.6 – SUPPORTING PUBLIC EDUCATION OF CHUMASH NATIVE AMERICAN MARITIME HERITAGE

- *Objective:* To assist Chumash tribal groups, organizations and individual Chumash community members in cultural revitalization among regional Chumash communities as pertains to their traditional maritime heritage, while inspiring understanding of and sustainable relationships with the ecosystems of the Sanctuary.
- *Implementation:* Maritime Heritage, and Education and Outreach staff, along with Chumash groups and individuals, and the Chumash Community Working Group

Background

As the indigenous people of the Channel Islands and surrounding region, the Chumash people are working to revitalize and sustain their rich maritime culture. CINMS staff would like to support those efforts by collaborating with the Chumash community to provide education and outreach. CINMS first began its support of education about Chumash maritime heritage through a partnership with the Chumash Maritime Association (CMA), a non-profit organization dedicated to revitalizing Chumash maritime heritage principally through use of the Chumash *tomol*, a traditional plank canoe. This ongoing partnership has expanded into a unique opportunity to assist not only CMA, but also other Chumash groups, such as the Barbareño Chumash Council (BCC), in cultural revitalization activities tied to sustainable relationships with the ecosystems of the Santa Barbara Channel.

Through support of CMA and BCC activities, as well as using other Chumash education and outreach opportunities, CINMS will help accomplish this goal. The first activity described below is one example of how the Sanctuary can help and has been helping to support activities that foster public education about Chumash maritime heritage. In 2004, the Sanctuary Advisory Council to CINMS was expanded to include a Chumash Community seat. With Sanctuary staff assistance, representatives to that seat have been promoting awareness of and interest in CINMS among Chumash community members. With continued Sanctuary support, they have convened a Working Group that promises to take an active part in advising Advisory Council Chumash Community seat representatives. Through these Advisory Council efforts, CINMS is supporting cultural revitalization of Chumash communities linked to the Channel Islands and surrounding Sanctuary waters.

The second activity described below will foster collaboration between the Sanctuary and Chumash partners to determine other ways the Sanctuary can help support public education about Chumash maritime heritage. Ways in which the Sanctuary and Chumash community have collaborated on education and outreach include development of educational posters, Chumash community field trips to the Sanctuary and Park, development of Chumash content within a Sanctuary documentary film (developed in 2007-2008), and development of a Chumash internship. These ideas may help serve as inspiration for potential future collaborative education projects with the Chumash community.

Activities (2)

(1) Support Various Watercraft-Paddling Journeys and Activities. CINMS will continue to assist CMA, BCC, and other Chumash groups in providing various paddling journeys for educational and resource awareness purposes. These journeys will include Channel crossings to the islands on a regular basis, long paddling events up and down the coast, and may also include one and two-person kayaking activities. CINMS provided funding for the 1996-97 construction of the contemporary *tomol* ('Elye'wun), and provided support for the first contemporary *tomol* Channel crossing excursion in 2001. CINMS has continued support for four subsequent Channel crossings and a few coastal journeys. The indigenous

maritime peoples living in the Pacific West Coast national marine sanctuaries share in common the revitalization of their traditional canoes. One proposed paddling journey is to join the Chumash with the Makah of the Olympic Coast National Marine Sanctuary (OCNMS) in a canoe gathering. The Chumash would initiate this along with other tribes involved according to tribal protocols.

Status: Initiated in 2001, repeated in 2004, 2005, 2006 and 2007; CINMS support for additional paddle excursions across years 1-5 will be based on Chumash groups' plans

Partners: Chumash Community Working Group; CMA; BCC; SBMM; CINP; and OCNMS

(2) Work with Representatives of the Chumash Community to Identify Mutual Objectives and Activities for Supporting Public Education about Chumash Maritime Heritage. In addition to supporting paddling journeys and activities, Sanctuary staff hope to collaborate with the Chumash community to identify other ways in which the Sanctuary can support public education about Chumash maritime heritage. The Sanctuary works with the Chumash community primarily through engaging the Sanctuary Advisory Council Chumash Community Working Group, which is open to membership from all branches of the Chumash community. After agreeing upon mutual objectives for Sanctuary support of public education about Chumash maritime heritage, the Sanctuary and Chumash community can collaborate to outline and prioritize specific activities that the Sanctuary can implement to meet those objectives.

Status: Initiated in year 1, ongoing thereafter

Partners: Chumash Community Working Group, other interested Chumash organizations, education and maritime heritage partners

Table 11. Estimated Costs for the Maritime Heritage Action Plan

Strategy	Estimated Annual Cost (in thousands)*					Total Estimated 5 Year Cost
	YR 1	YR 2	YR 3	YR 4	YR 5	
MH.1: Shipwreck Reconnaissance Program	\$20**	\$71.5 **	\$51.5 **	\$51.5 **	\$61.5 **	\$256 **
MH.2: MHR Volunteer Program	\$3.5	\$3.5	\$3.5	\$3.5	\$3.5	\$17.5
MH.3: Partnering With the Santa Barbara Maritime Museum	\$90 ^	\$118 ^	\$16 ^	-	-	\$224
MH.4: Implementing a Coordinated MHR Protection Outreach Effort	\$6	\$36	\$17.5	\$7.5	\$3	\$70
MH.5: Upgrading the Maritime Heritage Website	\$1.5	\$1.5	\$1.5	\$1.5	\$1.5	\$7.5
MH.6: Supporting Public Education of Chumash Native American Heritage	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$62.5
Estimated Total Annual Cost	\$133.5	\$243	\$102.5	\$76.5	\$82	\$637.5

* Cost estimates exclude base budget funding requirements (salaries, overhead, etc.).

** Contributions from outside funding sources also anticipated.

^ Includes funding from NMSP Capital Facilities allocations.

Addressing the Issues – Strategies From Other Action Plans

In addition to the strategies identified in this Maritime Heritage Action Plan, there are strategies from other action plans either directly or indirectly addressing maritime heritage issues, such as:

- Strategy BE.1 – Final Determination on Boundary Issue;
- Strategy AU.6 – Developing Education & Outreach Tools & Products;
- Strategy AU.7 – Visitor Center Support & Development; and
- Strategy EE.1 – Emergency Response Planning & Implementation

Addressing the Issues – Regulations

There is one Sanctuary regulation directly associated with CINMS maritime heritage resources. In summary, this regulation prohibits:

- Removing, damaging, etc. historical resources.

Sanctuary regulations are available at 15 CFR 922.70-922.74.

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 statement⁴⁴ 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 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_acousticpolicy.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.

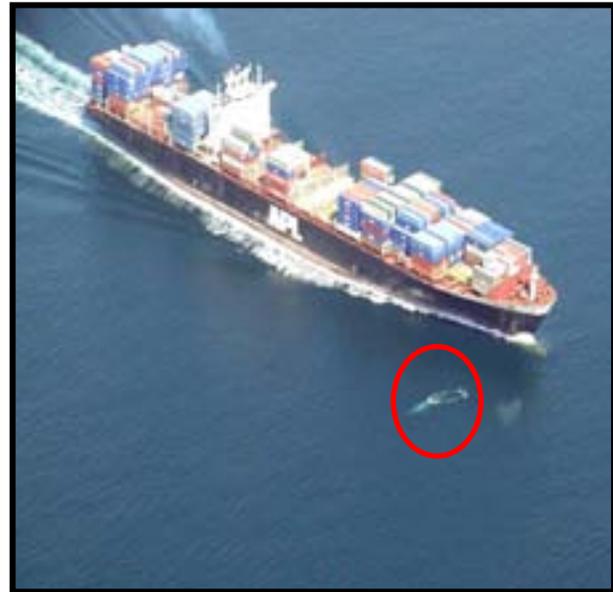


Figure 49. *The Santa Barbara Channel is an important route for both shipping traffic and migrating whales, as demonstrated by this container ship and blue whale (circled) in the southbound shipping lane near Anacapa Island. (U.S. Govt./NOAA)*

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 stranding⁵⁰ that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response.”

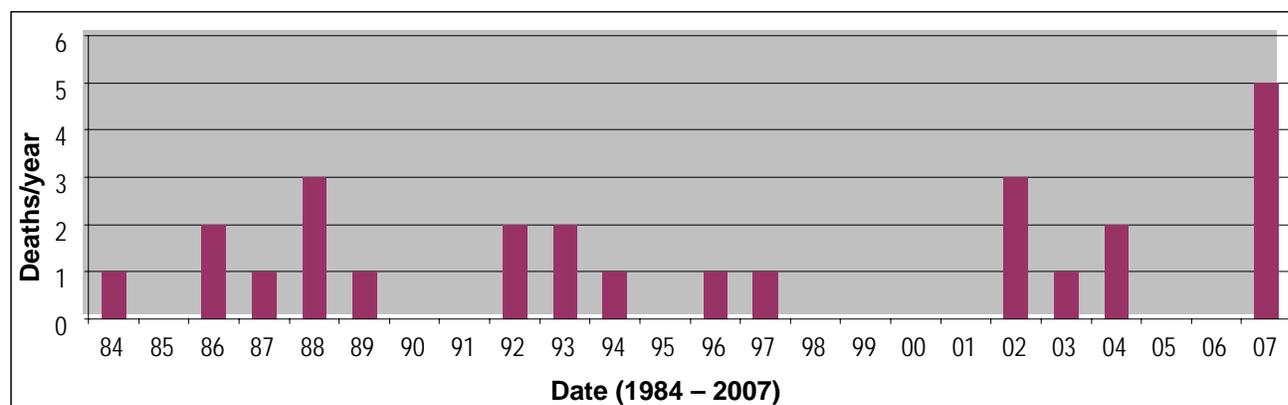


Figure 50. Number of blue whale fatalities offshore from California (1984 – 2007).

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

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.

OPERATIONS ACTION PLAN

Overview

While NOAA's NMSP provides oversight and coordination among the thirteen national marine sanctuaries, setting priorities for addressing resource management issues, and directing program and policy development, Sanctuary staff are responsible for onsite management and day-to-day operation of the Sanctuary. The purpose of this action plan is to outline the means and support necessary for CINMS to implement the activities and objectives contained in the other action plans.

The Operations Action Plan describes the Sanctuary's day-to-day administrative and operational activities. These activities are designed to effectively, efficiently, and safely utilize the Sanctuary's existing administrative, infrastructure, fiscal, and human resources. Some operational activities are designed to augment such resources through means such as contracts, partnerships, volunteers, and community involvement programs, or through assessments to identify other viable options for achieving Sanctuary objectives. In addition, given the Sanctuary is one of many entities involved in the management of resources within the Sanctuary, partnerships and community involvement programs aid in achieving comprehensive and coordinated management of Sanctuary resources.

Description of the Issues

The Sanctuary's primary operational issues fall within the following three categories: 1) working with the community and other authorities; 2) building human resources capacity; and 3) improving Sanctuary facilities. A number of specific issues regarding Sanctuary operations were raised during 1999 public scoping meetings, such as:

- The Sanctuary should identify the financial resources needed to meet current and future management objectives;
- There is a need for the Sanctuary to further coordinate, collaborate and partner with federal, state and local agencies, as well as with other entities; and
- Community action and citizen representation in Sanctuary management is critical.

Additional operational issues recognized by the Sanctuary Advisory Council, CINMS and NMSP headquarters staff include:

- Existing office facilities are inadequate;
- Visitor center facilities should be expanded;
- Existing staff resources do not provide sufficient capacity to fully address issues related to socioeconomic research and monitoring, multicultural education, and water quality; and
- Environmental impacts of Sanctuary facilities and operations should be evaluated and minimized where possible.

Working With The Community And Other Authorities

The Sanctuary is one of many authorities responsible for managing resources and human activities in the Channel Islands. As such, CINMS places a high value on working with the community and other regional authorities. Effective management requires an understanding of each authority's roles and responsibilities, as well as coordination among them. This understanding is important not only for staff of the various authorities, but also for their constituents. Given the diversity of interests among Sanctuary

stakeholders, it is important for CINMS to consider a wide range of perspectives when making management decisions, while ensuring consistency with the purposes of the NMSA.

Building Human Resources Capacity

Building human resources capacity is important not only to enable the Sanctuary to build upon its existing programs, but to address issues and develop programs not sufficiently met with current human resources.

For example, current Sanctuary staff have expertise in a wide variety of fields. To continually address the issues in this management plan, however, there is a need for on-site expertise in additional fields, such as water quality, multicultural education, and enforcement. In addition, some Sanctuary program areas are currently operated by a single staff person; in some instances, one staff position oversees multiple Sanctuary program areas. Thus, existing program areas may also benefit from additional human resources. CINMS is subject to federal limitations on hiring additional full time equivalent (FTE) employee positions as well as budgetary limitations on contracting additional services. As a result, CINMS must continue to utilize approaches to staffing other than FTE positions to augment human resources as needed.

Improving Sanctuary Facilities

Another operational issue for the Sanctuary is its limited facilities. The CINMS headquarters office is located at the Santa Barbara Harbor and the southern satellite office is located at the Channel Islands Harbor in Oxnard. Additional staff are located in an office building in downtown Santa Barbara. In 2003, Booz Allen Hamilton, a strategy, management and technology consulting firm, produced a Facilities Master Plan for CINMS. This plan contains an assessment of existing Sanctuary facilities, future staffing and space requirements, and an analysis of two alternatives for expanding Sanctuary facilities. According to the plan, Sanctuary office space is too small to accommodate existing staff and does not provide any capability for expansion.

Currently, the CINMS headquarters office houses fifteen work stations with an occupancy rate of 117 square feet per person, which is well below the occupancy rate of approximately 150 square feet per person suggested by industry standards and the General Services Administration (GSA). This plan also indicates a need for dedicated space to house a conference room, library, copy room, laboratory, and storage. Since neither Sanctuary office location has dedicated storage space, the Sanctuary rents public storage units for storing inventory, supplies and equipment. While CINMS does not maintain its own visitor center, it maintains exhibits at visitor centers and similar facilities operated by partner organizations (see the Public Awareness & Understanding Action Plan). In addition, Sanctuary headquarters in the Santa Barbara Harbor Waterfront Center are subject to local ordinances preventing the installation of additional signs outside the building, rendering CINMS offices effectively “invisible” and difficult to find. Although the plan indicates a need for expanded interactions with visitors, it also indicates large numbers of visitors would create serious operational problems given the crowded conditions of the existing offices.

Greening Sanctuary Facilities and Operations

In 2008, the NMSP announced a Blue Seas, Green Communities initiative designed to help green the National Marine Sanctuary System. CINMS has been working and continues to work towards “greener” operations, and greener facilities. CINMS management encourages energy efficiency in Sanctuary offices, along with recycling, using biodiesel when possible for research vessels, commuting by public transportation, and telecommuting. A significant step towards greening Sanctuary operations will take place when the Sanctuary relocates to its new headquarters on the UCSB campus. The new building will be constructed to the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) standards.

Addressing the Issues – Strategies For This Action Plan

There are seven strategies in this Operations (OP) Action Plan:

- OP.1 – Sanctuary Advisory Council Operations;
- OP.2 – Permitting and Activity Tracking;
- OP.3 – Relationships with Other Authorities;
- OP.4 – Vehicle, Boat & Aircraft Operations;
- OP.5 – Administrative Initiatives;
- OP.6 – Human Resources;
- OP.7 – Office Space Expansion; and
- OP.8 – Greening Facilities & Operations

Each of these strategies is detailed below.

STRATEGY OP.1 – SANCTUARY ADVISORY COUNCIL OPERATIONS

- *Objective:* The Advisory Council will continue to play an important role in advising the Sanctuary on resource management issues.
- *Implementation:* Community and Management Planning, Resource Protection, Education and Outreach, Research and Monitoring, and Maritime Heritage staff

Background

The CINMS Advisory Council was established in December 1998 to ensure continued public participation in management of the Sanctuary. Since its establishment, the Council has played a vital role in decisions affecting the Sanctuary, bringing valuable community advice and expertise to the task of assuring effective Sanctuary management. The Council provides a public forum for consultation and community deliberation on resource management issues affecting the Sanctuary.



Figure 52. Sanctuary Advisory Council members meet bi-monthly to discuss CINMS issues and advise the Sanctuary Superintendent. (CINMS)

One of the Council's most important strengths comes from the diversity of its membership. The Council consists of twenty-one voting members and twenty-one alternates representing the general public, tourism, business, recreational fishing, commercial fishing, non-consumptive recreation, education, research, conservation, and Chumash community interests, as well as local, state and federal government agencies. In addition, the Superintendents of three California national marine sanctuaries (Channel Islands, Gulf of the Farallones and Monterey Bay) participate as non-voting members of the Council. The in-depth and varied knowledge of these individuals, especially related to Sanctuary resources and values, combines to form a highly valuable collective body of expertise and experience.

The Council's objectives are to provide the Sanctuary Superintendent with advice on a variety of issues including:

- Protecting natural and historical resources, and identifying and evaluating emergent or critical issues involving Sanctuary use or resources;
- Identifying and realizing the Sanctuary's research objectives;
- Identifying and realizing educational opportunities to increase the public knowledge and stewardship of the Sanctuary environment; and
- Assisting to develop an informed constituency to increase awareness and understanding of the purpose and value of the Sanctuary and the NMSP.

Non-governmental Advisory Council representatives are appointed competitively by NOAA and serve voluntary two-year terms. The Council meets bi-monthly in open public sessions located throughout Ventura and Santa Barbara counties. Public participation at these meetings is welcomed and encouraged.

The Council is supported by a number of active working groups: the Conservation Working Group, Sanctuary Education Team (SET), Commercial Fishing Working Group, Recreational Fishing Working Group, Research Activities Panel, and Chumash Community Working Group. These working groups are created by and operate under the purview of the Council, and help to bring additional community members and experts to the Advisory Council to focus on specific issues or stakeholder group concerns. Some working groups meet as often as bi-monthly, while others meet less frequently.

CINMS will continue to offer support for the operation of the Advisory Council, and will increase efforts to improve its effectiveness and public accessibility.

Activities (3)

(1) Support the Operation and Administration of the Advisory Council. Sanctuary staff, primarily the Advisory Council Coordinator, will continue to provide support to the Advisory Council to ensure the effective handling of Advisory Council and working group meetings, public outreach, council communications, membership turnover, council documentation and outreach materials, web site information, budget tracking, and annual planning and reporting.

Status: Ongoing activity since 1998, to continue through years 1-5

Partners: Advisory Council

(2) Improve the Effectiveness of the Advisory Council. The function of the Advisory Council will be strengthened by evaluating and developing improved organizational strategies to enhance the Council's level of participation and overall effectiveness. This support will involve improving assistance provided to the Advisory Council with:

- Increased media communications;
- Strategic planning of meetings;
- Annual planning;
- Formation and operation of working groups and subcommittees;
- Timely and appropriate provision of education materials, training and presentations; and
- Effective recruitment of candidates for membership.

Status: Ongoing activities since 1998, improved approaches to begin in year 1

Partners: Advisory Council

(3) Sponsor Advisory Council-Hosted Issue Forums. Staff will support the Advisory Council in hosting public forums where Sanctuary resource management issues are discussed with the public. Such forums will seek wide public participation and will enable the community to learn from experts, hear a diverse range of perspectives and opinions, and offer input to the Advisory Council and CINMS. Through the Advisory Council, these public outreach efforts will be focused in two areas: 1) keeping the public informed about Sanctuary issues through periodically scheduled community forums; and 2) engaging the scientific community by inviting physical, biological and social scientists, as well as other subject matter experts, to publicly share knowledge about the Sanctuary and select management issues.

Status: Institute in year 2 and repeat annually in years 2-5

Partners: Advisory Council, research institutions, resource management agencies

STRATEGY OP.2 – PERMITTING AND ACTIVITY TRACKING

- *Objective:* To ensure information gained through research, education, salvage, and management activities conducted in the Sanctuary informs Sanctuary management and benefits CINMS programs and/or resources.
- *Implementation:* Staff from all seven functional areas

Background

Tracking research, education, salvage, and management activities, and where appropriate, permitting such activities otherwise prohibited by Sanctuary regulations is important to Sanctuary operations. By developing a means to track activities not requiring a permit, Sanctuary management may benefit from the voluntary sharing of valuable knowledge and experience gained through the use of the Sanctuary. In addition, the CINMS permit program provides a mechanism to allow appropriate research, education, salvage, and resource management activities that may benefit Sanctuary management but would otherwise be prohibited by Sanctuary regulations (see discussion of regulations in the FEIS, Vol. II, Section 2.0), while requiring modifications to or conditions for proposed activities to reduce their impacts upon Sanctuary resources and qualities. The permit program also provides a mechanism for denying permit requests in order to protect CINMS resources and qualities. Additional background on Sanctuary permits is provided in Section II, Part D.

Activities (3)

(1) Continue Careful Oversight and Issuance of Permits. Permitting will be conducted and coordinated by Sanctuary staff. The Sanctuary Superintendent will approve permits with the oversight of NMSP headquarters staff, provided some permits require headquarters approval. When evaluating an activity proposed to be conducted in the Sanctuary, the potential for injury is evaluated against the expected benefits of the outcome or use of the data. Proposed activities that may result in injury to Sanctuary resources must be of the highest quality and of benefit to the Sanctuary. The permitting process will remain straightforward and will usually not require substantial resources from either CINMS or the applicant. The results of all permitted research, as appropriate, will be made available to the Sanctuary and the public.

Status: Ongoing activity; will continue across years 1-5

Partners: CA Dept. of Fish and Game; Channel Islands National Park; U.S. Fish and Wildlife Service; NOAA Fisheries; U.S. Coast Guard

(2) Develop a Voluntary Research Registry. CINMS will develop an outreach program to encourage the regional scientific community, who are conducting research that does not require a Sanctuary research permit, to inform CINMS of the nature and intent of their research. The voluntary research registry will allow CINMS to spatially track research activities, understand the types of research activities being undertaken and benefit from research and monitoring findings from projects the Sanctuary did not directly assist or permit.

Status: Permitted and directed research is currently tracked and reported; extramural research tracking will be implemented by year 2, maintained thereafter

Partners: CA Dept. of Fish and Game; Channel Islands National Park; U.S. Fish and Wildlife Service; NOAA Fisheries; U.S. Coast Guard; UCSB and other Academic and independent researchers

(3) Consider Developing Voluntary Registries for Other Activities. Based on the initial success of the voluntary research registry CINMS staff will consider developing voluntary registries for other types of activities that may benefit Sanctuary management such as education activities. As in the research registry additional registries may allow CINMS to spatially track activities, understand the types of activities being undertaken, and benefit from the knowledge and experienced gained during registered projects the Sanctuary did not directly assist or permit.

Status: Implement in year 3

Partners: Internal



Figure 53. The voluntary research registry will help CINMS track the nature and extent of non-permitted research conducted in the Sanctuary. (Brad Doane)

STRATEGY OP.3 – RELATIONSHIPS WITH OTHER AUTHORITIES

- *Objective:* To work in a coordinated, complementary, and comprehensive manner with authorities with whom CINMS has similar or overlapping mandates, jurisdiction, objectives, and/or interests.
- *Implementation:* Staff from all seven functional areas

Background

Since many local, state, and federal authorities have mandates, jurisdiction, objectives, and interests similar to or overlapping with those of CINMS, the Sanctuary maintains relationships with many of these entities. These relationships enable the Sanctuary and its partners to share resources and expertise, and to work in a coordinated, complementary, and collaborative manner to the extent practicable. The authorities with which CINMS maintains relationships, as well as the mechanisms used to formalize such relationships, are described in Section II, Part D. These relationships may also facilitate the transfer of knowledge regarding participating authorities' (including CINMS) resource protection, education and outreach, community involvement, and research programs, along with policies and regulations.

Activities (5)

(1) Conduct Outreach to Agencies and Stakeholders. CINMS staff will provide ongoing and increased guidance to local, state, and federal agencies, private sector stakeholders, and the public at large through targeted outreach programs and products.

Status: Ongoing activity; will continue across years 1-5

Partners: Internal, Advisory Council members, volunteers

(2) Comment at Public Hearings on Issues Affecting the CINMS. CINMS staff will increase efforts to offer comment at public workshops or hearings where decisions are being made or input is being sought regarding a decision with the potential to affect the resources or qualities of the CINMS.

Status: Ongoing activity; will continue across years 1-5

Partners: Internal

(3) Review and Comment on Relevant Plans and Projects. CINMS will review and comment on plans, projects, proposals, and policies that may impact Sanctuary resources. Such items may include coastal program updates, fishery management plans, and environmental review documents. As required by law, and when otherwise possible, CINMS staff will consult with other authorities to ensure proposed policies, plans, and projects (whether conducted directly by that authority, or permitted by it) do not violate Sanctuary regulations, are designed to minimize impacts to Sanctuary resources, and do not unduly impact appropriate public access and enjoyment of the CINMS.

Status: Ongoing activity; will continue across years 1-5

Partners: Numerous

(4) Enhance Partnership with the Channel Islands National Park. Since the Park and Sanctuary were established in 1980 the two entities have maintained a partnership based on their overlapping boundary and shared mandate to protect the northern Channel Islands resources. As of 2003 CINMS and CINP have combined their volunteer interpretive programs into one joint program known as the Channel Islands Naturalist Corps. In addition, CINMS and CINP held a joint all-staff meeting in 2003, and management

plan review staff from both agencies have consulted with one another regarding information to be provided in one another's revised management plans. The Sanctuary plans to continue these aspects of the relationship with the park, as well as to look for new ways to strengthen the partnership.

Status: Ongoing activity; will continue across years 1-5

Partners: CINP

(5) Utilize and Maintain Tools to Formalize Relationships with Other Authorities.

The CINMS Superintendent may draw from a selection of tools to formalize interactions with other federal, state and local agencies or the private sector including: memoranda of understanding/memoranda of agreement (MOUs/MOAs), interagency agreements, grants, cooperative agreements, contracts, joint project agreements, and consultation. These tools are explained in the Sanctuary Operational Setting (Section II). Beyond initially employing such tools, the Sanctuary must periodically review the terms contained within existing tools to determine whether, for example, the objectives of an old MOU have been met or are no longer relevant and if a new MOU should be developed with a given authority.

Status: Ongoing activity; will continue across years 1-5 and applied as appropriate

Partners: Numerous

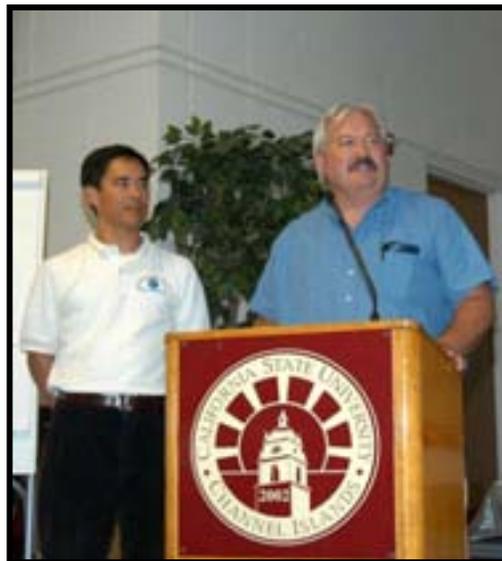


Figure 54. CINMS Superintendent Chris Mobley and CINP Superintendent Russell Galipeau at a 2003 joint Sanctuary/Park staff meeting. (Robert Schwemmer)

STRATEGY OP.4 – VEHICLE, BOAT & AIRCRAFT OPERATIONS

- *Objective:* To operate Sanctuary vehicles, vessels and aircraft in a safe and efficient manner.
- *Implementation:* Staff from all seven functional areas

Background

CINMS currently maintains a fleet of four vehicles, and two vessels. Additionally, the Sanctuary uses contract aircraft on an as-needed basis. Fleet maintenance is crucial to supporting Sanctuary activities from transporting staff, displays, and equipment to community events to conducting research and educational trips aboard Sanctuary vessels and conducting reconnaissance and research flights aboard aircraft. Fleet maintenance operations include determining when craft need to be repaired and/or replaced, overseeing maintenance and repair work, procuring new craft and associated equipment, training staff in the proper use and safety protocols for each type of craft and associated equipment, and keeping required records for all fleet craft.

Activities (3)

(1) Acquire and Maintain Sanctuary Vehicles. The Sanctuary Vehicle Control Officer (VCO) acquires vehicles as necessary through the General Services Administration (GSA) or other sources as appropriate. The VCO oversees maintenance, repairs, and replacement of vehicles as required by GSA. The VCO ensures vehicles are kept in a safe and operable condition, and that all federal regulations are followed regarding appropriate use of government vehicles. The VCO maintains records of vehicle use and type and amount of fuel. These records are sent to NOAA's Western Regional Acquisition Division (WRAD) quarterly or as requested by WASC.

Status: Ongoing activity; will continue across years 1-5

Partners: WRAD, GSA

(2) Maintain and Renovate Sanctuary Vessels. Sanctuary staff oversee vessel safety, scheduling, maintenance, training and drills, along with planning and executing vessel missions for both the *R/V Xantu* and *R/V Shearwater*. Vessel safety includes arranging safety inspections by authorized inspectors for all vessel systems at required intervals. Minimum vessel staffing requirements for daytrips on the *Shearwater* and the new *Xantu* are one licensed operator (captain) and one deckhand. Operations that exceed twelve hours require a second licensed operator. One additional crew member, or staff member familiar with the boat, is required for each ten persons embarked, though not required for the first ten. Because demand for vessel time far exceeds that which CINMS can realistically meet, CINMS has incorporated a formal, competitive project proposal and sea-day allocation process that occurs each fall, in preparation for the upcoming field season. Vessel allocation request forms and associated deadlines are published on the CINMS website each fall. Instructions within the request forms specify the criteria to be used when making allocation decisions, adjusted annually as appropriate. In general, allocation decisions are based on the consideration of factors including, but not limited to, meeting Management Plan objectives, addressing Sanctuary resource threats, and remaining within vessel-specific capabilities, and practical and financial constraints. A committee of CINMS program coordinators then reviews submitted proposals and allocates sea days to those proposals that most closely adhere to CINMS' Conservation Science, Public Awareness & Understanding, Emergency Response & Enforcement, and Maritime Heritage action plans and strategy requirements. Among research and monitoring-oriented projects, CINMS assigns priority to those projects most likely to provide information that will help to close information gaps.

Status: Ongoing activity; will continue across years 1-5

Partners: NOAA Marine and Aviation Operations, NMSP Small Boat Program

(3) Contract and Partner Agency Aircraft Operations. When using contract and partner agency aircraft (including NOAA aircraft), the Sanctuary Operations Manager ensures the aircraft meet all NOAA safety requirements and that all Sanctuary staff flying in the aircraft meet NOAA aviation safety training requirements, as well as contractor or partner agency requirements.

Status: Ongoing activity since 1999; will continue across years 1-5

Partners: NOAA Aircraft Operations Center, CDFG, USCG

STRATEGY OP.5 – ADMINISTRATIVE INITIATIVES

- *Objective:* To administer the Sanctuary in a safe, consistent, and effective manner, ensuring basic site needs are met.
- *Implementation:* Sanctuary Superintendent, Site Operations and Office Administration staff, Designated Safety Officer

Background

Sanctuary administrative initiatives are overseen by the Sanctuary Superintendent and carried out primarily by site operations and office administration staff. Administrative initiatives address basic administrative support activities essential to day-to-day operations, with the exception of human resources and vehicle/vessel operations, described in their own strategies. Administrative initiatives include oversight of finances, services, and basic equipment and supplies. In addition, ensuring staff are provided with a safe and secure work environment is a basic requirement of administrative support. Two activities aimed at aiding the Sanctuary in meeting its basic administrative support needs are also included in this strategy: 1) working with the regional NOAA administrative support center, and 2) enhancing the Sanctuary's partnership with its affiliated non-profit foundation.

Activities (5)

(1) Continue to Manage Sanctuary Finances. CINMS will continue to perform budget planning and tracking, and produce an annual operating plan. The management plan will be used as a guide to help set budget and project priorities outlined each year in the annual operating plan.

Status: Ongoing activity since designation; will continue across years 1-5

Partners: Internal

(2) Ensure a Safe and Secure Working Environment. CINMS will continue to maintain a designated Safety Officer assigned to brief staff regularly on safety and emergency response measures for offices, vehicles, vessels, and aircraft. Safety and emergency response measures address emergency and health risks, homeland security requirements and natural disasters. The Safety Officer will continue to oversee the provision of safety materials in Sanctuary offices, vehicles, vessels, and aircraft; coordinate with various agencies for safety inspections; and keep appropriate and required training and administrative records. Staff, contractors, and interns will continue to complete safety courses as required by the NOAA Environmental Compliance and Safety Office, along with NOAA security awareness courses.

Status: Ongoing activity; will continue across years 1-5

Partners: Internal, NOAA Environmental Compliance and Safety Office

(3) Work with the NOAA Western Regional Center (WRC). The WRC provides a comprehensive suite of administrative services including procurement, personnel services, health and safety, administrative payments, space management, regional engineering, environmental compliance, publications, information technology (IT) support, and security. CINMS will continue to work with the WRC as needed for these services.

Status: Ongoing activity; will continue across years 1-5

Partners: Internal NOAA

(4) Identify, Prioritize, and Fill Equipment and Service Needs. The Sanctuary will continue to prioritize equipment, supplies, and service needs, and attempt to procure funds to meet these needs.

Status: Ongoing activity; will continue across years 1-5

Partners: Internal

(5) Enhance Partnership with the Channel Islands Marine Sanctuary Foundation. The Channel Islands Marine Sanctuary Foundation is a nonprofit organization founded in 1995 with a mission to support the management, research and educational goals of the Channel Islands National Marine Sanctuary. CINMS will look for opportunities to enhance the partnership between the Sanctuary and foundation.

Status: Partnership began in mid-1990s; will continue across years 1-5

Partners: Channel Islands Marine Sanctuary Foundation, National Marine Sanctuary Foundation



Figure 55. CINMS staff regularly attend safety briefings as well as trainings in the use of safety equipment such as survival suits. (CINMS)

STRATEGY OP.6 – HUMAN RESOURCES

- *Objective:* To manage sufficient human resources for implementing existing and planned Sanctuary activities.
- *Implementation:* Sanctuary Superintendent, Office Administration staff

Background

The NMSP places a high value on human resources. Ensuring Sanctuary staff are sufficient, well managed, trained, and supported is a critical part of Sanctuary operations. Providing sufficient Sanctuary human resources may require recruitment of new staff, including NOAA Corps officers, to fill vacancies. Due to restrictions in adding and hiring for GS positions, along with budgetary limitations, CINMS supplements its existing staff resources through contracts, internships, volunteer programs, and partnerships. These additional people may contribute skills and expertise, and/or provide services and products for various Sanctuary programs and projects as needed. The activities in this action plan focus on the Sanctuary's primary paid human resources: GS position staff, and contractors. More information specific to Sanctuary interns and volunteers, and partners, is provided in Strategies AU.2 and OP.3.

Activities (4)

(1) Provide Human Resources Services for Staff. CINMS will continue to provide human resources services for staff including: recruitment and retention; training and career enhancement; administrative oversight of payroll, benefits, and travel; oversight of time and attendance; employee performance evaluations; and recognition for staff achievements.

Status: Ongoing activity; will continue across years 1-5

Partners: Internal, NOAA Western Regional Acquisition Division (WRAD)

(2) Maintain Sanctuary Contracts. The Sanctuary currently maintains contracts with individuals who provide products and services such as web site development, database coordination, information technology (IT) support, planning, scientific support, administration, and vessel operations and maintenance. Maintaining contracts requires administrative oversight of procurement, invoices, and quarterly performance reports.

Status: Ongoing activity; will continue across years 1-5

Partners: Internal, NOAA Western Regional Acquisition Division (WRAD)

(3) Identify Mechanisms to Augment and Stabilize Paid Human Resources. Sanctuary staff will work to identify mechanisms to augment and stabilize its staff and contractor workforce. Mechanisms may include: detail and rotational assignments from within NOAA, NMSP headquarters or other agencies; longer-term contracts; and partnering with the University of California at Santa Barbara (UCSB), National Marine Sanctuary Foundation and Channel Islands Marine Sanctuary Foundation, which may provide support for Sanctuary-related programs and projects.

Status: Ongoing since 2000; will continue across years 1-5

Partners: Channel Islands Marine Sanctuary Foundation, internship and fellowship programs

(4) Continue Partnership with the NOAA Corps. CINMS has traditionally filled higher-level Sanctuary positions with officers from the NOAA Corps. These officers are trained in engineering, earth sciences, oceanography, meteorology, fisheries science, and other related disciplines. Throughout NOAA they

operate ships, fly aircraft, manage research projects, conduct diving operations, and serve in staff positions. Commissioned officers generally serve for two years on each assignment or billet, though they may serve for short durations on specific projects as well. Salaries and benefits for officers on assignment at the Sanctuary are subsidized by the NOAA Corps and the National Ocean Service (NOS). CINMS will continue its partnership with the NOAA Corps and will continue to fill select staff positions with NOAA Corps officers as appropriate.

Status: Ongoing activity; will continue across years 1-5

Partners: NOAA Corps

STRATEGY OP.7 – OFFICE SPACE EXPANSION

- *Objective:* To provide well designed, environmentally efficient office space for Sanctuary staff, strengthen our relationship with UCSB and provide continuity for staff and the public by securing a long-term location for CINMS HQ and education/outreach programs.
- *Implementation:* Staff from all seven functional areas

Background

The main CINMS office space facility is located at Santa Barbara Harbor (CINMS headquarters), supporting approximately 15 work stations. Additional smaller offices are located in Oxnard at the Channel Islands Harbor (4 work stations) and in downtown Santa Barbara in the Balboa Building (4 work stations). The CINMS headquarters space has been occupied at or beyond capacity for several years, and lacks feasible options for further expansion either on site or at other office locations. The CINMS headquarters office also lacks such basic features as a conference room and storage space, and local ordinances restrict most Sanctuary public signage. In addition, staff workstations are sized well below the NOAA, NMSP and industry standards.

Recognizing these conditions, the NMSP hired in 2003 a consultant (Booz Allen Hamilton) to conduct a study of CINMS facilities needs. The study resulted in the development of a Facilities Master Plan for CINMS analyzing options for securing additional office space, placing signage, and locating educational exhibits. With regard to office space, the Facilities Master Plan considered factors such as current and future staffing levels, future space requirements, moving and annual costs, and decentralized vs. centralized office configurations. The study found the best value option for securing additional office space while also enhancing exhibits and visitor center services would be to pursue a proposal emerging from the University of California at Santa Barbara (UCSB).

UCSB's Marine Science Institute (MSI) has for several years partnered and collaborated with CINMS on many research, monitoring and educational programs and projects. With plans already in place to construct a marine education and outreach center, MSI approached CINMS in 2002 with the idea of constructing such a center on campus at a site next to the MSI building that might also provide the needed additional CINMS office space (see also Strategy OP.8 activity, 1). From this initial idea UCSB took the lead on fundraising. In 2004 the NMSP provided some initial funding for preliminary design and feasibility work. In fiscal year 2005, Congress awarded \$4 million to the project and in fiscal year 2006 awarded an additional \$3 million. These funds are being applied toward the design and construction of the CINMS office space and Outreach Center for Teaching Ocean Sciences (OCTOS), to be housed together in an Ocean Science Education Building. UCSB and MSI are raising private funds to match the federal funding. CINMS will not own the new facility, but will enter into a long-term lease with UCSB.

Activities (3)

(1) Participate in Building Design. CINMS staff will continue to play a leading role in design work for the new office space and education center. Staff will continue to co-chair the project's Building Committee and serve as a liaison to CINMS and NMSP staff involved in or affected by the project.

Status: Staff assistance with design phase began in 2004 and will continue through years 1-5

Partners: UCSB, MSI, hired architects and exhibit designers

(2) Assist UCSB with Project Management During Building Construction. Upon completion of final design work, approval of all necessary permits, and assuming adequate additional funding has been secured (through UCSB sources and fundraising efforts), CINMS staff will assist with a variety of project oversight duties during the construction phase. This will involve close partnership and collaboration with project participants from UCSB and MSI, NMSP, and hired contractors, and other tasks as needed and appropriate.

Status: Expected to occur during years 1-2

Partners: UCSB/MSI, hired contractors

(3) Develop CINMS Moving Plan and Conduct Move. Prior to the completion of construction, CINMS will develop a plan for the reallocation of staff and resources. This will likely involve the redesign of space at the Santa Barbara Harbor office (some of which may be kept as part of CINMS facilities) and decisions about the placement of individual staff, departments, equipment and other assets. When construction is completed, the moving plan will be implemented and use of the new office will commence.

Status: Planning in year 1, moving in year 2

Partners: University of California, UCSB/MSI

STRATEGY OP.8 – GREENING FACILITIES & OPERATIONS

- *Objective:* To comply with the most up-to-date industry and government standards for green building and green operating procedures.
- *Implementation:* All Sanctuary staff.

Background

Greening is defined as adopting or aligning with ideals or practices related to protecting the natural environment from destruction or pollution. Stated another way, greening is the act of incorporating environmental considerations into our professional and personal activities. Going green is a natural extension of the NMSP and CINMS commitment to environmental conservation; it will help CINMS further protect Sanctuary resources, contribute to addressing climate change, save money, and protect the health and welfare of our staff. In order to officially go green, the NMSP launched a Blue Seas, Green Communities Initiative. For more information on the initiative and how the National Marine Sanctuary System is going green see the Spring/Summer 2008 edition of Sanctuary Watch (<http://www.sanctuaries.noaa.gov/news/pdfs/sanctuarywatch/sw0608.pdf>). Furthermore, greening facilities and operations will also help CINMS meet the requirements of various executive orders and legislation:

- Executive Order 13101 – Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition – signed on September 14, 1998, orders each agency head to “incorporate waste prevention and recycling in the agency’s daily operations and work to increase and expand markets for recovered materials through greater Federal Government preference and demand for such products.”
- Executive Order 13123 – Greening the Government Through Efficient Energy Management – signed on June 3, 1999, orders federal agencies to improve energy management in order to save money and reduce emissions that contribute to air pollution and global climate change.
- Executive Order 13148 – Greening the Government Through Leadership in Environmental Management – signed on April 21, 2000, directs the head of each federal agency to integrate “environmental accountability into agency day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions.” The Department of Commerce issued an environmental management manual in November 2004 outlining how our department will implement this executive order and establishing the department’s policy to be good stewards of the environment.
- Executive Order 13423 – Strengthening Federal Environmental, Energy and Transportation Management – signed on January 30, 2007, places renewed emphasis on federal agencies leading by example to improve energy efficiency and reduce greenhouse gas emissions.
- The Energy Policy Act of 2005 directs that “to the extent practicable, the Secretary of the Interior, the Secretary of Commerce, and the Secretary of Agriculture shall seek to incorporate energy efficient technologies in public and administrative buildings associated with management of the National Park System, National Wildlife Refuge System, National Forest System, National Marine Sanctuaries System, and other public lands and resources managed by the Secretaries” and “the Secretary of the Interior, the Secretary of Commerce, and the Secretary of Agriculture shall seek to use energy efficient motor vehicles, including vehicles equipped with biodiesel or hybrid engine technologies, in the management of the National Park System, National Wildlife

Refuge System, National Forest System, National Marine Sanctuaries System, and other public lands and resources managed by the Secretaries.”

Activities (4)

(1) Utilize Leadership in Energy and Environmental Design (LEED)-Certified Building. The Ocean Science Education Building (OSEB) at UCSB, also mentioned in Strategy OP.7, will be certified as LEED Gold. This is one level above the minimum LEED standard for the NMSP. Innovative features that are being incorporated into the design include:

- Using a heat exchanger to take advantage of the cold sea water exiting the MSI and OCTOS (see Strategy OP.7) aquaria to enhance the passive cooling systems;
- Optimizing sun exposure through careful orientation of the structure and employing carefully designed shading strategies; and
- Maximizing airflow in the building by using operable windows and roof vents.

Status: Construction in years 1-2, benefits of environmental design ongoing

Partners: University of California, UCSB/MSI

(2) Green Sanctuary Vehicle and Vessel Operations. Sanctuary staff has been actively working to green vehicle and vessel operations for several years, and continue to make improvements in this direction. Sanctuary vessel captains make a concerted effort to refuel using biodiesel whenever possible (as of the printing of this document, the only vendor in the region offering biodiesel is located in Ventura Harbor). In 2008, the Sanctuary replaced its fleet sedan with a hybrid vehicle. The Sanctuary maintains a policy that staff are only to use the fleet’s less fuel efficient vehicles when the greater space they provide is necessary to transport large numbers of people and/or supplies.

Status: Ongoing

Partners: WRAD, GSA

(3) Reduce, Reuse, Recycle. CINMS staff recycle batteries, cardboard, paper, plastic and glass as a regular part of daily operations. Offices are stocked with at least 30% post-consumer recycled paper stock, and staff reuse paper and make efforts to minimize use of new paper whenever possible.

Status: Ongoing

Partners: none

(4) Reduce Energy Consumption. CINMS staff make a concerted effort to reduce energy consumption during the course of normal office operations by taking simple measures such as setting computer systems to revert to power saving mode, by using natural ventilation, and keeping lights off. There are plans to have the OSEB design reviewed by the U.S. Department of Energy’s National Renewable Energy Lab (NREL) to ensure efficient energy consumption once staff are housed in the new building. Similar reviews of other NMSP building projects have resulted in significant net energy savings.

Status: Ongoing

Partners: University of California, UCSB/MSI, NREL

Table 13. Estimated Costs for the Operations Action Plan

Strategy	Estimated Annual Cost (in thousands)*					Total Estimated 5 Year Cost
	YR 1	YR 2	YR 3	YR 4	YR 5	
OP.1: Sanctuary Advisory Council Operations	\$18	\$18	\$18	\$18	\$18	\$90
OP.2: Permitting and Activity Tracking	-	-	-	-	-	-
OP.3: Relationships With Other Authorities	-	-	-	-	-	-
OP.4: Vehicle, Boat & Aircraft Operations	\$270	\$279	\$279	\$279	\$279	\$1386
OP.5: Administrative Initiatives	\$32.5	\$32.5	\$32.5	\$32.5	\$32.5	\$167
OP.6: Human Resources	-	-	-	-	-	-
OP.7: Office Space Expansion	**	**	**	**	**	**
OP.8: Greening Facilities & Operations***	\$1.5	\$2	\$3	\$4	\$5	\$15.5
Total Estimated Annual Cost	\$322	\$331.5	\$332.5	\$333.5	\$334.5	\$1654

* Cost estimates exclude base budget funding requirements (salaries, overhead, etc.).

** Costs covered by the NMSP capital facilities fund (not the CINMS budget) and with the University of California.

***Estimated operational costs associated with this strategy reflect increases above current base budget expenditures for vehicle and vessel fuels, and vehicle leases. Green office supplies and practices are already absorbed into the CINMS base budget (not reflected here), and do not represent a planned increased operational cost. Not included are construction costs for the new OSEB LEED Gold-certified building, which will not be borne by the CINMS operational budget. As such, these cost estimates do not reflect NOAA's full planned investment in greening. Also not reflected here is the possibility of reduced energy costs based on increased energy efficiencies. Costs may vary based on changes in the availability of alternative fuels near the CINMS offices and Sanctuary vessel home ports.

Addressing the Issues – Strategies From Other Action Plans

The Operations Action Plan links to each of the strategies in the other action plans since it outlines the activities necessary for implementing all other Sanctuary activities. However, the Operations Action Plan is strongly linked to several particular strategies from other action plans also addressing Sanctuary operational issues:

- Strategy AU.2 – Community Involvement/Volunteer & Intern Program Development;
- Strategy AU.3 – Team OCEAN;
- Strategy AU.5 – Greater Southern California Outreach;
- Strategy AU.6 – Developing Education & Outreach Tools & Products;
- Strategy AU.7 – Visitor Center Support & Development;
- Strategy CS.3 – Supporting Monitoring and Site Characterization Programs;
- Strategy CS.4 – Collaborative Marine Research Project;
- Strategy WQ.2 – Water Quality Protection Planning;
- Strategy EE.2 – Expanding Enforcement Efforts;
- Strategy MH.2 – MHR Volunteer Program;
- Strategy MH.3 – Partnering With the Santa Barbara Maritime Museum; and

- RP.2 – Responding to Identified Issues

Addressing the Issues – Regulations

Strategy OP.2 (Permitting and Activity Tracking) is guided by the Sanctuary’s permit regulations, which address terms and conditions for issuance of Sanctuary permits. Sanctuary regulations are available at 15 CFR 922.70-922.74.

PERFORMANCE EVALUATION ACTION PLAN

Overview

As part of an effort to improve overall management of sanctuaries, ongoing and routine performance evaluation is a priority for the NMSP. Both site-specific and programmatic efforts are underway to better understand the NMSP's ability to meet stated objectives and to address the issues identified in this management plan. Beyond these principal goals, performance evaluation has many other benefits, including:

- Highlighting successful (as well as less than successful) efforts of site management;
- Keeping the public, Congress, and other interested parties apprised of Sanctuary effectiveness;
- Helping managers identify resource gaps so 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 appropriate, measurable outcomes;
- Providing a means for managers 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.

Throughout the management plan review process, CINMS staff worked with NMSP staff to develop performance measures for the action plans in this management plan. The principal objective of these measures is to present a set of performance targets demonstrating progress towards strategy objectives for each action plan. Site-specific performance measures are also designed in part to comport with the NMSP's program-wide performance measures, available in the NMSP's strategic plan at <http://sanctuaries.noaa.gov/management/strategic.html>. The NMSP developed its program-wide performance measures to assess progress towards achievement of the NMSP's goals, which are outlined in the management plan's Introduction section.

Description of the Issues

Evaluating performance is now a part of the regular cycle of management for the NMSP. Periodic external reviews have taken place over the course of the NMSP's existence. In addition, a process for integrating a system for performance evaluation has been implemented in recent years. Program performance measures are the yardstick with which the NMSP measures progress towards its goals and objectives. They set specific, time-conditional targets for large, thematic management categories that are addressed across multiple sites and/or headquarters branches. Currently, there are 21 NMSP performance measures comprised of long-term (10+ years) outcomes and mid-term (5-10 years) or short term (annual to 5 years) outputs. The long-term outcome performance measures established in 2004 require that the NMSP improve or maintain the quality of water, habitat and living marine resources in all sites before 2015. In addition, the NMSP must adequately characterize one hundred percent of the sanctuary system by 2015. There are 17 other output performance measures aggressively pursued by the NMSP.⁵¹

⁵¹ More information about program-wide performance evaluation can be found here: <http://sanctuaries.noaa.gov/management/effective.html>.

Very little had been done to measure management performance prior to the scoping period for this management plan review was an issue staff (both site and headquarters), the Advisory Councils, and the public recognized as one that should be addressed. As a result, NMSP headquarters staff began working on models for integrating NMSP performance evaluation into the management plan review process. With the measures in this management plan, CINMS is initiating the performance measurement process for the Sanctuary and, therefore, beginning to establish a baseline of information the NMSP can use to evaluate effectiveness of site management. Strategy EV.1-Measuring Sanctuary Performance Over Time describes this process in more detail.

Addressing the Issues - Strategies For This Action Plan

There is one strategy in this Evaluation (EV) Action Plan:

- EV.1 – Measuring Sanctuary Performance Over Time

This strategy is detailed below.

STRATEGY EV.1 – MEASURING SANCTUARY PERFORMANCE OVER TIME

- *Objective:* To effectively and efficiently incorporate performance measurement into the regular cycle of CINMS, and overall NMSP, management.
- *Implementation:* Staff from all seven functional areas

Background

This strategy details the process by which the Sanctuary will measure its management performance over time. Figure 56 depicts the basic idea behind this process, which will be implemented in all sanctuaries undergoing management plan review.

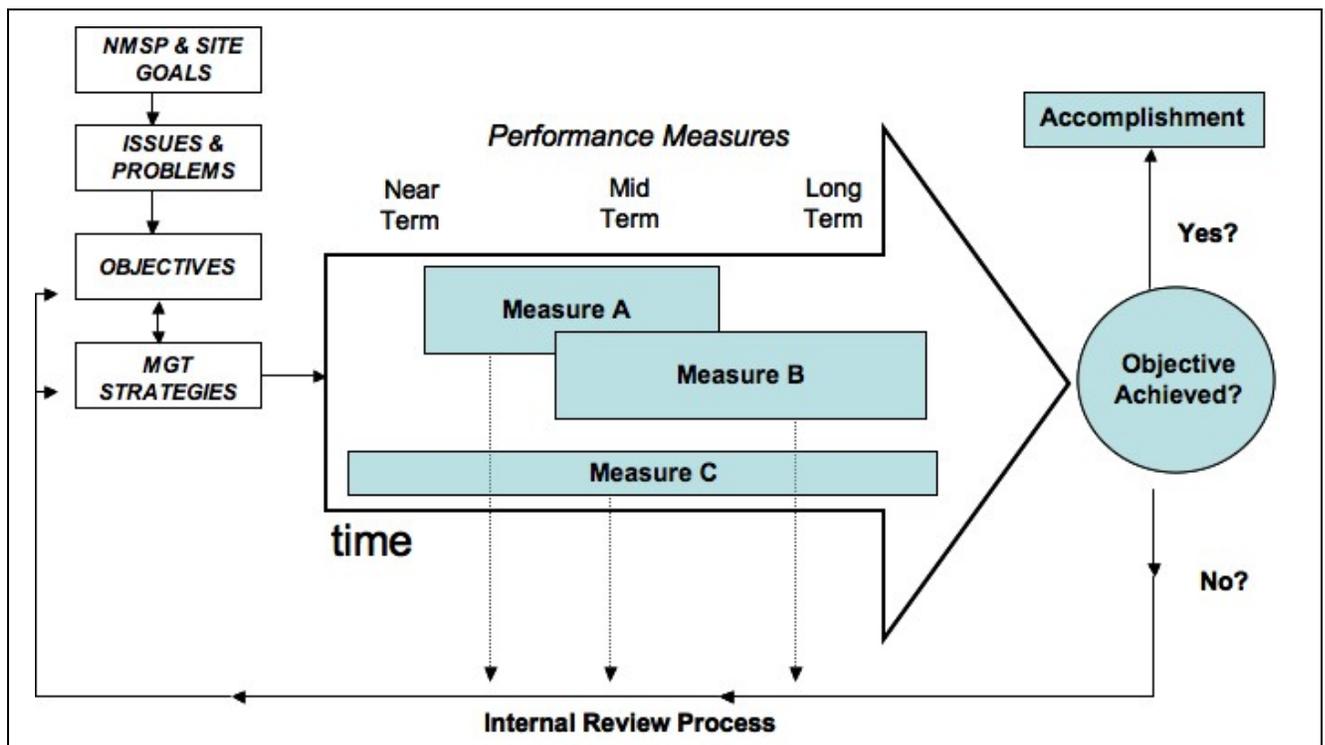


Figure 56. NMSP performance evaluation logic model

Issues and problems are identified during the scoping process relative to NMSP and site goals. Staff then work to develop objectives relative to proposed management strategies (as identified in each of the action plans). Performance measures are then drafted, which identify the means by which the Sanctuary will evaluate its progress towards achievement of the objectives. As represented by the large arrow in Figure 56, measures can (and should) be developed to provide information on results over time, from the near term (within one year, for example) to the long term (over the span of ten years or more, for example). As these measures are monitored over time, data is collected on progress towards the achievement of outcomes and the production of outputs (or products). Objectives achieved and outputs produced are reported as accomplishments; inability to achieve objectives or produce outputs are also reported, but as areas falling short of targets. In these areas, staff will work to identify the issues preventing management

from reaching targets (represented in Figure 56 by the arrow running along the bottom of the graphic). This internal review is one of the primary benefits of performance evaluation process as it provides an opportunity for staff to think carefully about why particular actions are not meeting stated targets and how they can be altered to do so.

All performance measures for this management plan are found in a series of nine tables (one for each action plan) at the end of this action plan. Each table identifies (1) the action plan's proposed management strategies, (2) the objectives identified for each of those strategies, (3) the performance measure(s) to track the achievement of the desired outcome, and (4) the specific metrics of the performance measure.

The information produced by performance measures in sanctuary management plans will be used not only to improve the management of individual sanctuaries, but to inform programmatic performance evaluation as well. Currently, there are twenty-one program performance measures for the NMSP.

There are two activities in this action plan. Each is designed to carry the Sanctuary through the performance evaluation process and integrate performance measurement into the regular cycle of site management. In the case of this action plan, it is not anticipated there will be any additional costs beyond core operational expenses (labor and administrative overhead).

Activities (2)

(1) Monitor Existing Performance Measures Consistently Over Time. CINMS staff will conduct routine performance evaluations to collect and record data on Sanctuary performance over time. Using this data, staff will determine effectiveness 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.

Status: Begins with implementation of this management plan and continues through years 1-5

Partners: Internal

(2) Report Results. Results from performance monitoring will be collected and analyzed and used to inform NOS or NOAA-wide performance requirements as necessary. Performance data may also be presented in a site-specific annual report explaining each measure, how it was evaluated, the site team conducting the evaluation, and next steps. Based on this analysis, site staff, in cooperation with the Advisory Council, will identify accomplishments as well work to determine those management actions needing 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 capacities). The public may have opportunity to comment on the Sanctuary's perception of its performance, ways in which the site could be more effective and methods for improving performance measurement when evaluation is on the agenda at future Advisory Council meetings.

Status: Begins with implementation of this management plan and continues through years 1-5

Partners: Internal

Table 14. Estimated Costs for the Performance Evaluation Action Plan

Strategy	Estimated Annual Cost*					Total Estimated 5 Year Cost
	YR 1	YR 2	YR 3	YR 4	YR 5	
EV.1: Measuring Sanctuary Performance Over Time	-	-	-	-	-	-
Total Estimated Annual Cost	-	-	-	-	-	-

*Because this is an internal exercise, it is estimated that costs for implementing this strategy will involve base budget funding only (staff time), which is not reflected in this table.

Addressing the Issues – Strategies From Other Action Plans

The purpose of the Performance Evaluation Action Plan is to evaluate the effectiveness of the various strategies contained within this management plan. In this regard, all strategies from the other action plans are associated with the Performance Evaluation Action Plan.

Addressing the Issues – Regulations

Not applicable. There are no Sanctuary regulations associated with the issues in the Performance Evaluation Action Plan. Sanctuary regulations are available at 15 CFR 922.70-922.74.

Table 15. Performance Measures for the Public Awareness & Understanding Action Plan

Strategies	Objective	Performance Measures	Metrics
AU.1 Education Program Development	To link local teachers with national efforts to improve ocean literacy.	Increased public participation in CINMS education programs.	Number of K-12 teachers participating in Sanctuary education workshops.
			Number of K-12 teachers requesting Sanctuary education tools and materials.
			Number of regional participants in LiMPETS program.
		Increased awareness about the CINMS in the K-12 community.	Number of national initiatives & events sponsored by CINMS over next 5 years.
			Number of presentations given by CINMS education staff at regional/ national conferences.
AU.2 Community Involvement/Volunteer & Intern Program Development	To increase community awareness about the Channel Islands National Marine Sanctuary and the National Marine Sanctuary Program through the development of CINMS volunteers and interns.	Growing number of public opportunities to learn about CINMS goals, programs and issues.	Number adult education classes offered/number students enrolled.
		Increased citizen participation in marine conservation efforts at CINMS.	Number of surveys in REEF database.
		Improved volunteer/intern program effectiveness and efficiency.	Number of volunteers and interns participating in Sanctuary programs.
			Number of intern or volunteer applications submitted.
			Biannual evaluation of volunteer programs.
AU.3 Team OCEAN	To build on the success of Team OCEAN Programs at other national marine sanctuaries by fully achieving the network's three primary goals.	Improvements in visitor's educational experience.	Passenger survey cards.
		Increased interest in use of Channel Islands Naturalist Corps (CINC) volunteers.	Number of marine excursion businesses participating in CINC program and attending legal/regulatory workshops.
			% of commercial outfitter passengers exposed to CINC volunteers.
			Satisfaction of marine excursion captains with SNC volunteers (survey).
		Increased knowledge base of CINC volunteers.	Scope of Sanctuary resource knowledge by SNC volunteers.
		Improved interpretive enforcement results within the Sanctuary.	Number of boaters and contacts made by Marine Watch volunteers.
Number of citations issued for environmental disturbance.			

Table 15 p. 1 of 3

Table 15. Performance Measures for the Public Awareness & Understanding Action Plan

Strategies	Objective	Performance Measures	Metrics
AU.4 Developing Outreach Technology	To provide timely and accurate information about the Sanctuary’s natural resources, issues and activities as they occur.	Well organized, reliable and comprehensive information on CINMS provided in a timely manner.	Annual evaluation of quality and utility of web site.
		Increased public access to information via web site, web-based tools and Sanctuary interactive kiosks.	Web site hits and use levels of remote Sanctuary interactive kiosks.
		Improved performance record of website, Sanctuary interactive kiosks and remote systems.	Ratio of system uptime to downtime.
			Number of weather-related vessel problems.
Expanded range for outreach technology.	Number and location of new Sanctuary interactive kiosks installed.		
AU.5 Greater Southern California Outreach	To establish a presence and identity for the Sanctuary and its various programs in the Ventura and Los Angeles region.	Established Sanctuary presence and identity in the Ventura and LA County region.	Size and diversity of audiences reached with education and outreach programs.
		Increased awareness of Sanctuary by constituents in the Ventura and LA County region.	Number of Sanctuary outreach products installed and distributed.
			Extent of regional education and outreach programs provided.
Strengthened Sanctuary constituency in the Ventura and LA County region.	Number of new regional education partners.		
AU.6 Developing Education & Outreach Tools & Products	To provide Sanctuary information to a widely diverse audience.	Expanded subscriber base and distribution of publications.	Number of new product subscribers.
			Number of materials distributed.
		Maintained quality of publications and other materials/tools.	Audience feedback on quality of publications and materials.
			Frequency of inventory, review and update of publications and materials.
AU.7 Visitor Center Support & Development	To maximize the Sanctuary’s regional public exposure through the development of exhibits and programs at planned and developed marine and natural resource-based visitor centers.	Increased regional public exposure to CINMS.	Number of visitors at various facilities; use level of Sanctuary interactive kiosks.
			Extent of “repeat business” at visitors centers.

Table 15 p. 2 of 3

Table 15. Performance Measures for the Public Awareness & Understanding Action Plan

Strategies	Objective	Performance Measures	Metrics
AU.8 MPA Network Education	To raise awareness and understanding among the general public and Sanctuary users of the system of marine reserves and conservation areas within the Sanctuary.	MPAs fully incorporated into existing educational outreach products and services.	Percentage of existing products modified to incorporate the MPA network.
		Community-based, long-term educational strategies for MPAs implemented.	SAC strategic recommendation received.
			Number of MPA network education strategies implemented over next five years.
AU.9 Multicultural Education	To build Sanctuary stewardship and increase understanding of ocean related threats within the Hispanic communities of Santa Barbara and Ventura counties.	Educational strategy for reaching the Latino community understood by CINMS education and outreach staff.	Audiences, themes and tools for multicultural education in the region identified.
		Increased awareness in the regional Latino community of marine science, conservation and management as well as CINMS resources.	Extent of regional education and outreach programs provided to Latino audiences.

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Table 16. Performance Measures for the Conservation Science Action Plan

Strategies	Strategy Objective	Performance Measures	Metrics
CS.1 SAMSAP	To analyze historical data and create predictive models for resource management through near real-time data collection.	Statistically reliable SAMSAP data is collected on a weekly basis (on average), provided to agencies and external entities, and packaged for Sanctuary management needs.	Number of SAMSAP flights per year.
			Record of SAMSAP data distribution, reports, and papers.
CS.2 Comprehensive Data Management	To integrate CINMS data into existing regional and national data management programs that will facilitate conservation science-based decision-making.	CINMS data is publicly available in a web-based data node.	Frequency of internal data access and use.
			Web-based statistical tracing of public access to data.
CS.3 Support Monitoring and Site Characterization Programs	To support monitoring programs and build a database of Sanctuary resources.	As made available, research program findings are obtained and analyzed for CINMS management purposes.	Connection between research projects and relevant current management issues.

Table 16 p. 1 of 2

Table 16. Performance Measures for the Conservation Science Action Plan

Strategies	Strategy Objective	Performance Measures	Metrics
CS.4 Collaborative Marine Research Project	To foster research collaboration among scientists, various agencies and fishers and to obtain rigorous scientific data on issues of concern to these groups.	Program funding secured; a minimum of two new collaborative projects selected and implemented within 5 years.	Funding sources and levels.
			Progress toward project implementation.
CS.5 Research Interpretation	To communicate and interpret for the public, NOAA, the scientific community, and other resource managers, the research activities taking place in and around the Sanctuary.	Progressive increase in projects interpreted and people reached.	Number of interpreted projects.
			Web site visitation and meeting/seminar participation levels.
CS.6 Biological Monitoring of MPA Network	To measure the biological effects of the Channel Islands MPA Network.	Full establishment of multi-agency/organization monitoring partnerships.	Identification of funding needs and sources.
			Status of monitoring program operations.
		Monitoring results reported in a consistent and usable fashion.	Quantity and quality of data. Consistency of data collection and analysis efforts.
CS.7 Socioeconomic Monitoring of MPA Network	To demonstrate the socio-economic effects of the Channel Islands MPA network.	Full establishment of multi-agency/organization monitoring partnerships.	Identification of funding needs and sources.
			Quantity and quality of data.
		Monitoring results reported in a consistent and usable fashion.	Consistency of data collection and analysis efforts.
CS.8 Automated Identification System (AIS) Vessel Tracking	To use AIS information to track vessel traffic and vessel trends within the CINMS, enhancing socioeconomic and scientific research as well as Sanctuary resource protection capabilities.	Queriable AIS database to analyze vessel traffic, speed averages and variations, and ID individual vessels.	Access and serve data from multiple, geographically dispersed, AIS receivers.

Table 16 p. 2 of 2

Table 17. Performance Measures for the Boundary Evaluation Action Plan

Strategies	Strategy Objective	Performance Measures	Metrics
BE.1 Final Determination on Boundary Issue	To conduct a scientifically rigorous, open public process to consider, analyze and make a final determination on changing the boundary of the Sanctuary.	Establish the appropriate Sanctuary boundary.	Review of preliminary and draft materials with the Sanctuary Advisory Council; responses to public, SAC and agency comments.

Table 18. Performance Measures for the Water Quality Action Plan

Strategies	Strategy Objective	Performance Measures	Metrics
WQ.1 Offshore Water Quality Monitoring	To better evaluate and understand localized and large-scale spatial and temporal impacts from oceanographic and climatic changes and impacts from increases in human population in the coastal zone and subsequent pressure(s) on offshore marine resources.	Improved knowledge of Sanctuary water quality characteristics and associated human influences.	Documented Sanctuary-relevant water quality monitoring results.
WQ.2 Water Quality Protection Planning	To protect the chemical, physical and biological integrity of the Sanctuary by restoring and maintaining water quality.	Improvement in efforts at addressing Sanctuary water quality issues.	Consultation effort with water quality protection agencies and organizations.
		Improvement in knowledge of water quality issues, management and needs.	Ability to identify existing jurisdictional authorities and needed protections.

Table 19. Performance Measures for the Emergency Response & Enforcement Action Plan

Strategies	Objective	Performance Measures	Metrics
EE.1 Emergency Response Planning & Implementation	To be prepared for response to oil spills, hazardous material spills, grounded vessels and natural or human initiated disasters.	On call volunteers and CINMS staff fully trained and available for response.	Staff and volunteer training readiness.
		Full participation in regional emergency response efforts involving the Sanctuary.	Attendance and participation at ACP meetings, drills, and response events.
EE.2 Expanding Enforcement Efforts	To promote resource protection through compliance with Sanctuary regulations and other applicable state and federal statutes and regulations.	Progressive increase over time in enforcement presence within the Sanctuary.	Progress towards Marine Watch program establishment.
			Number of enforcement vessel hours spent in Sanctuary.
			Number of Marine Watch volunteer boaters.
		Progressive increase over time in knowledge of quality and quantity of user group data.	Number of documented enforcement incidents.

Table 20. Performance Measures for the Maritime Heritage Action Plan

Strategies	Objective	Performance Measures	Metrics
<p>MH.1 The Shipwreck Reconnaissance Program</p>	<p>To contribute to scientific knowledge and enhancement of management practices related to underwater historical resources by encouraging research and monitoring efforts.</p>	Improved knowledge of cultural and historical resources in the Sanctuary.	Number of known cultural and historic sites recorded in the CINMS MHR inventory.
		Improved documentation and protection of CINMS MHRs.	Number of CINMS MHR sites monitored regularly.
		Increase in CINMS MHR outreach opportunities.	Number of outreach products requested.
			Use of maritime heritage website.
<p>MH.2 MHR Volunteer Program</p>	<p>To provide an opportunity for individuals most interested in maritime heritage resource protection to become stewards and representatives of the CINMS.</p>	Maintain volunteer contribution to the CINMS Maritime Heritage Program.	Number of trained participants in MHR volunteer program.
			Database tracking the number of artifacts and shipwrecks documented by CINMS MHR volunteers in the form of: underwater maps, photos, videos, and the MHR reconnaissance report.
<p>MH.3 Partnering With the Santa Barbara Maritime Museum</p>	<p>To promote the stewardship role of CINMS, Channel Islands National Park and the State of California in providing research, developing public awareness, overseeing visitor use and protecting MHRs.</p>	Increase in public opportunities to learn about CINMS MHRs at the SBMM.	Number of public SBMM lectures provided by Sanctuary staff.
			Number and duration of Sanctuary-based exhibits on display.
<p>MH.4 Implementing a Coordinated MHR Protection Outreach Effort</p>	<p>To enhance the quality of visitor use and avoid injury to archaeological resources.</p>	Improved user awareness of Sanctuary MHR sites.	Number of MHR sites developed into underwater slates.
			Number of underwater slates requested by divers.
		Improved MHR protection and damage mitigation.	Distribution of/requests for shipwreck video.
			Level of human-induced disturbance to sites tracked by monitoring programs.

Table 20 p. 1 of 2

Table 20. Performance Measures for the Maritime Heritage Action Plan

Strategies	Objective	Performance Measures	Metrics
MH.5 Upgrading the Maritime Heritage Website	To promote understanding of, appreciation for and involvement in the protection and stewardship of maritime heritage to a wide spectrum of the public.	CINMS MHR information disseminated to an increasingly wider audience (e.g., students, educators, researchers, and divers).	Number of maritime heritage website hits/hits to specific MHR pages.
MH.6 Supporting Public Education of Chumash Native American Maritime Heritage	To assist Chumash tribal groups, organizations and individual Chumash community members in cultural revitalization among regional Chumash communities as pertains to their traditional maritime heritage, while inspiring understanding of and sustainable relationships with the ecosystems of the Sanctuary.	Maintained support of Chumash paddling journeys and activities.	Number of Chumash paddling journeys and activities supported.
		Increased opportunities for public awareness of Chumash history.	Number of visitors to/participants in cultural outreach events.

Table 20 p. 2 of 2

Table 21. Performance Measures for the Resource Protection Action Plan

Strategies	Objective	Performance Measures	Metrics
RP.1 Identifying & Assessing Current and Emerging Issues	To identify, understand and prioritize current and emerging issues that may pose a threat to Sanctuary resources or qualities.	Improved issue identification and quality of risk assessment.	Number of issues tracked.
RP.2 Responding to Identified Issues	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.	Improved response time to prioritized issues.	Response time to new issues.
			Documented audit trail of responses to issue.
RP.3 General Marine Zoning	To consider the use of marine zoning as a tool to protect and enhance biodiversity and manage various uses of the Sanctuary.	Improved decision-making capacity in the application of specific management tools, such as marine zoning.	Data analysis and zone utility evaluation.
			Spatial distribution of resources and activities within the Sanctuary.
			Analysis and description of alternative management tools.

Table 22. Performance Measures for the Operations Action Plan

Strategies	Objective	Performance Measures	Metrics
OP.1 Sanctuary Advisory Council Operations	The Advisory Council will continue to play an important role in advising the Sanctuary on resource management issues.	More efficient SAC operations.	Number of tasks accomplished in SAC annual plan.
		More informed and active Advisory Council on CINMS policy issues.	Average member attendance level at SAC meetings over next 5 years.
			Number of SAC recommendations and advice provided on policy issues.
OP.2 Permitting and Activity Tracking	To ensure information gained through research, education, salvage, and management activities conducted in the Sanctuary informs Sanctuary management and benefits CINMS programs and/or resources.	Net benefit to Sanctuary resources from permitted activities.	Ratio of resource benefit to resource damage resulting from permitted activities.*
		Greater awareness of the nature, extent, and results of non-permitted research projects conducted in the Sanctuary.	Number of voluntary research project registrations.
OP.3 Relationships With Other Authorities	To work in a coordinated, complementary, and comprehensive manner with authorities with whom CINMS has similar or overlapping mandates, jurisdiction, objectives, and/or interests.	Stakeholder and agency awareness of Sanctuary regulations and policies.	Number of Sanctuary regulatory violations by other authorities, or permitted by other authorities.
		Minimized Sanctuary resource and public access impacts resulting from other authorities' decisions, plans, projects, proposals, and policies.	Extent of CINMS staff participation in other authorities' public hearings, workshops, and other consultations regarding activities that may impact the Sanctuary.
		Enhanced partnerships with CINP, and other authorities.	Extent of collaboration, including use of tools such as MOUs, between CINMS staff and staff from other authorities.
OP.4 Vehicle, Boat & Aircraft Operations	To operate Sanctuary vehicles, vessels and aircraft in a safe and efficient manner.	Staff have access to fully functional vehicles, vessels, and aircraft as needed.	Number of days government vehicles, vessels and NOAA or other aircraft were needed but unavailable.
		Proper safety equipment and a safe working environment are maintained on all vehicles, vessels, and aircraft.	Results of vessel safety inspections, and random checks of safety equipment in vehicles and aircraft.

Table 22 p. 1 of 3

*Note that the activity must have at most short-term and negligible adverse effects on Sanctuary resources and qualities.

Table 22. Performance Measures for the Operations Action Plan

Strategies	Objective	Performance Measures	Metrics
OP.5 Administrative Initiatives	To administer the Sanctuary in a safe, consistent, and effective manner, ensuring basic site needs are met.	Funding secured in Sanctuary budget for activities staff designate as high priority.	Percentage of funding necessary for full implementation of high priority activities realized.
		Staff knowledgeable in vehicle, vessel, and aircraft safety procedures and equipment.	Frequency of, and staff attendance at safety briefings and trainings.
		Reliable equipment and services.	Percentage of workdays essential equipment was non-functional.
		Enhanced partnership with Channel Islands Marine Sanctuary Foundation.	Number of joint CIMS F - CINMS projects and transactions.
OP.6 Human Resources	To manage sufficient human resources for implementing existing and planned Sanctuary activities.	Maintain staffing at levels necessary to conduct mandated Sanctuary activities.	Number and duration of staff vacancies and contract gaps.
		Ability to meet additional staffing needs.	Extent and diversity of non-GS human resources utilized by the Sanctuary.
			Number of Sanctuary activities not implemented, or partially implemented, due to staffing limitations.
OP.7 Office Space Expansion	To provide well designed, environmentally efficient office space for Sanctuary staff, strengthen our relationship with UCSB and provide continuity for staff and the public by securing a long-term location for CINMS HQ and education/outreach programs.	Timely development of new office space.	Facilities move-in by 2009.
		Adequate Sanctuary facilities.	Average per-person occupancy rate of at least 150 square feet per person in office facilities.
			Availability of Sanctuary-dedicated space for: storage, library, conference, and laboratory facilities.
		Improved public visibility of the Sanctuary.	Number and geographic range of additional Sanctuary signs and placards placed.

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Table 22. Performance Measures for the Operations Action Plan

Strategies	Objective	Performance Measures	Metrics
OP.8 Greening Facilities & Operations	To comply with the most up-to-date industry and government standards for green building and green operating procedures.	Reduced energy consumption	Number of miles driven using hybrid fleet vehicle vs. other using other vehicles.
			Measurable reduction in energy use at all CINMS offices over five-year period.
			Number of gallons biodiesel used instead of regular diesel for CINMS research vessels.

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Table 23. Performance Measures for the Performance Evaluation Action Plan

Strategies	Objective	Performance Measures	Metrics
EV.1 Measuring Sanctuary Performance Over Time	To effectively and efficiently incorporate performance measurement into the regular cycle of CINMS, and overall, NMSP management.	Performance measurement is fully integrated into site management.	Consistency of monitoring and reporting.
		Results are reported consistently and fairly.	Regularity of reporting; review of results by the SAC.
		Results directly impact management decision-making.	Regular evaluation of performance process utility; application of programmatic criteria to determine role of MP performance measures in decision making process.

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SECTION IV: APPENDICES



*Figure 57. Diver mapping the shipwreck Cuba at San Miguel Island.
(Mark Norder)*

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APPENDIX A: ACTION PLAN SUMMARY TABLES

This management plan proposes a complex suite of strategies and activities contained within nine diverse action plans. Appendix A provides summary information about these action plans in two tables: Appendix A1 and Appendix A2. While the action plans are detailed through over 160 pages of text, Appendix A1 below provides a basic overview of each action plan by strategy and activity. Information about the status, funding source, and partnership coordination is provided for each activity. Because the availability of funds is contingent upon the federal appropriations process, which varies from year to year, and because priorities also shift throughout time, the precise level of implementation for each activity is not predicted here. Appendix A2 on page 236 presents base budget (core operations and programmatic costs) and capital facility estimates for years one through five of this management plan.

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Appendix A1

Table 24. Action Plan Summary Table

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Awareness and Understanding Action Plan							
Strategy AU.1 - Education Program Development							
(1) Develop teacher workshops	◇	□	◉	H	H	H	
(2) Continue to develop education programs addressing water quality	◈	▣	●	M	M	H	
(3) Provide content for GIS “Mapping an Ocean Sanctuary” education materials	◇	□	○	M	M	M	
(4) Continue support of Oceans to Classrooms marine science series	◇	■	◉	H	H	H	
(5) Conduct student field monitoring	◆	▣	◉	M	M	M	
(6) Partner with the mobile marine education van	◇	■	◉	L	L	L	
(7) Participate in NOAA/NMSP national initiative strategies	◆	▣	◉	M	M	H	
Strategy AU.2 - Community Involvement/Volunteer & Intern Program Development							
(1) Provide presentations at regional and national workshops and conferences	◇	□	◉	M	M	M	
(2) Continue adult education programs and From Shore to Sea lecture series	◆	□	◉	M	M	M	
(3) Maintain interagency interpretive program with CINP	◈	▣	◉	H	H	H	
(4) Maintain the Great Annual Fish Count Program	◇	▣	●	M	M	M	
(5) Maintain the CINMS Internship Program	◇	□	◉	H	H	H	

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Strategy AU.3 - Team OCEAN							
(1) Maintain the Channel Islands Naturalist Corps		◈	▣	◉	H	H	H
(2) Develop Sanctuary Marine Watch volunteer program		◆	□	◉	L	M	M
(3) Integrate CINMS Volunteer Program strategies into NMSP volunteer efforts		◆	□	◉	H	H	H
(4) Engage in Ocean Etiquette Programming		◆	□	◉	M	M	H
Strategy AU.4 - Developing Outreach Technology							
(1) Expand website capabilities		◈	□	○	M	M	M
(2) Increase the number of CINMS interactive kiosks		◈	□	◉	M	H	H
(3) Participate in national telepresence initiative		◆	▣	◉	M	M	H
(4) Maintain interactive Marine Mammal Sightings Database		◆	□	◉	M	M	M
Strategy AU.5 - Greater Southern California Outreach							
(1) Place Channel Islands Harbor Boating Instruction & Safety Center exhibits, panels and literature		◆	□	◉	M	M	M
(2) Implement outreach plans and volunteer programs		◈	□	◉	H	H	H
(3) Implement COSEE-West Programs		◇	■	◉	M	M	M

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Strategy AU.6 - Developing Education & Outreach Tools & Products							
(1) Maintain various print publications		◇	□	◉	M	M	M
(2) Support various other educational materials		◇	□	◉	M	M	M
(3) Support other outreach materials		◇	□	◉	M	M	M
(4) Sponsor Sanctuary cruises		◇	□	◉	M	M	M
(5) Participate in outreach events		◇	□	◉	H	H	H
Strategy AU.7 - Visitor Center Support & Development							
(1) Partner with the Outdoors Santa Barbara Visitor Center		◇	▣	◉	M	M	M
(2) Partner with the Ty Warner Sea Center		◆	■	◉	H	H	H
(3) Maintain exhibits for the Cabrillo High School Aquarium		◇	▣	◉	M	M	M
(4) Partner with the Channel Islands Harbor Boating Instruction and Safety Center		◆	■	◉	M	M	M
(5) Work with the South Coast Watershed Resource Center		◇	□	◉	L	L	M
(6) Maintain/Improve CINMS presence at CINP Visitor Center		◆	□	●	H	H	H
(7) Assist in development of the Outreach Center for Teaching Ocean Sciences		◆	▣	●	H	H	H

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Strategy AU.8 - MPA Network Education							
(1) Implement SET recommendations for MPA network education and outreach products and services	◆	□	○	M	M	M	
(2) Develop printed educational products	◆	■	◎	M	M	H	
(3) Conduct Sanctuary cruises	◆	□	○	M	M	M	
(4) Develop, place, and maintain interpretive signs and kiosks	◆	□	◎	H	H	H	
(5) Maintain MPA network website	◆	□	○	H	H	H	
Strategy AU.9 - Multicultural Education							
(1) Retain bilingual community liaison	◆	■	○	M	M	H	
(2) Develop and adapt multicultural elements	◆	□	○	H	H	H	
(3) Implement the Multicultural Education Strategic Plan	◆	■	○	H	H	H	
Conservation Science Action Plan							
Strategy CS.1 - Sanctuary Aerial Monitoring and Spatial Analysis Program							
(1) Continue SAMSAP data collection	◆	□	◎	H	H	H	
(2) Produce data and trends analysis	◆	□	○	M	M	M	

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Strategy CS.2 - Comprehensive Data Management							
(1) Identify applicable data nodes		◆	□	○	H	H	H
(2) Process and maintain existing and new data		◆	□	○	H	H	H
Strategy CS.3 - Support Monitoring and Site Characterization Programs							
(1) Continue support for monitoring		◈	▣	◉	M	M	H
(2) Continue seafloor mapping project		◇	▣	◉	H	H	H
(3) Continue support for seabird studies		◈	▣	◉	M	M	H
(4) Support site characterization research projects		◆	▣	◉	M	M	M
(5) Develop carbon budget for the Sanctuary		◆	▣	◉	L	M	H
Strategy CS.4 - Collaborative Marine Research Project							
(1) Select and implement research projects		◈	□	◉	M	H	H
Strategy CS.5 - Research Interpretation							
(1) Interpret and disseminate Sanctuary research findings		◈	□	◉	H	H	H
(2) Develop a research-focused website / implement SIMoN		◈	□	○	H	H	H
(3) Disseminate research information at public venues		◆	□	○	M	M	M
(4) Develop a voluntary research registry		◆	□	◉	M	M	M

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Strategy CS.6 - Biological Monitoring of MPA Network							
(1) Maintain and expand MPA network biological monitoring program		◆	▣	●	H	H	H
(2) Utilize various existing CINMS research and monitoring programs in support of the MPA network		◈	□	●	H	H	H
(3) Develop and implement an MPA network deep water monitoring plan		◆	▣	●	H	H	H
Strategy CS.7 - Socioeconomic Monitoring of MPA Network							
(1) Develop and implement MPA network socioeconomic monitoring program		◆	▣	●	H	H	H
Strategy CS.8 - Automated Identification System (AIS) Vessel Tracking							
(1) Work with partners to install an AIS transceiver		◆	▣	●	H	H	H
(2) Work with partners to create an Internet access point for CINMS AIS data		◆	▣	●	H	H	H
(3) Download and analyze AIS data		◆	▣	◉	M	H	H
(4) Work with Scripps Institute of Oceanography on anthropogenic noise study		◆	■	●	M	M	H
Boundary Evaluation Action Plan							
Strategy BE.1 - Final Determination on Boundary Issue							
(1) Prepare and release draft SEIS/SMP		◆	□	○	M	H	H
(2) Issue final SEIS/SMP; make final decision on boundaries		◆	□	○	M	H	H

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Water Quality Action Plan							
<i>Strategy WQ.1 - Offshore Water Quality Monitoring</i>							
(1) Continue support for Plumes and Blooms	◇	■	●	M	M	M	
(2) Continue support for Southern California Bight Regional Monitoring Surveys	◇	■	●	M	M	M	
(3) Continue support for CINMS water quality monitoring initiatives	◆	■	●	L	M	M	
<i>Strategy WQ.2 - Water Quality Protection Planning</i>							
(1) Complete Water Quality Characterization Report	◆	■	●	H	H	H	
(2) Compile and synthesize information on jurisdictional water quality authorities and responsibilities	◆	□	◎	M	H	H	
(3) Review state and regional water quality management	◆	□	○	M	H	H	
(4) Develop and propose priority corrective actions for managing Sanctuary water quality impacts	◆	□	○	M	M	H	
Emergency Response & Enforcement Action Plan							
<i>Strategy EE.1 - Emergency Response Planning & Implementation</i>							
(1) Identify specific emergency response duties for CINMS staff	◆	■	○	H	H	H	

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(2) Implement SHIELDS and RUST		◆	□	◉	H	H	H
(3) Train additional emergency response volunteers		◆	□	◉	M	M	M
(4) Develop an emergency response manual		◈	□	◉	H	H	H
(5) Develop modeling program as part of SAMSAP		◈	□	○	M	H	H
Strategy EE.2 - Expanding Enforcement Efforts							
(1) Plan and implement interpretive enforcement via Sanctuary Marine Watch (Team OCEAN)		◆	□	◉	M	M	H
(2) Maintain effective vessel and aircraft surveillance operations		◈	▣	◉	H	H	H
(3) Cross-deputize other regional enforcement personnel		◆	▣	●	H	H	H
Maritime Heritage Action Plan							
Strategy MH.1 - The Shipwreck Reconnaissance Program							
(1) Maintain the CINMS MHR inventory		◇	□	◉	H	H	H
(2) Continue year-round monitoring of known sites		◈	▣	◉	M	M	M
(3) Produce various MHR-focused outreach materials		◈	□	○	M	H	H
Strategy MH.2 - MHR Volunteer Program							
(1) Work with volunteers in the production of waterproof shipwreck maps		◆	▣	◉	L	L	L

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		◆	□	◎	M	M	M
		◇	■	◎	L	L	L
Strategy MH.3 - Partnering With the Santa Barbara Maritime Museum							
		◇	□	◎	M	M	M
		◇	□	◎	M	M	M
		◇	□	◎	M	M	M
Strategy MH.4 - Implementing a Coordinated MHR Protection Outreach Effort							
		◆	□	◎	M	M	M
		◆	□	○	M	M	M
		◆	□	○	M	M	M
Strategy MH.5 - Upgrading the Maritime Heritage Website							
		◆	□	◎	M	M	H
		◆	□	◎	M	M	M
		◆	□	◎	H	H	H
Strategy MH.6 - Supporting Public Education of Chumash Native American Maritime Heritage							
		◆	■	◎	M	M	H

Appendix A1

Table 24. Action Plan Summary Table

STATUS ◇ Existing w/ no significant modification ◆ Existing w/ significant modification ◆ New (since 2002) or future; not yet implemented FUNDING □ Funding is internal only (CINMS & NMSP) ■ Internal and external sources provide funding ■ Major funding source is external	PARTNERSHIP COORDINATION ○ None (may include SAC input) ◎ Significant reliance on partners ● Not possible w/o partners IMPLEMENTATION LEVEL (BASED ON FUNDING SCENARIO) H High level of implementation M Medium level of implementation L Low level of implementation	STATUS	FUNDING	PARTNERSHIP COORDINATION	IMPLEMENTATION LEVEL		
					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
(2) Work with Chumash community representatives to identify mutual objectives and activities		◆	□	●	M	M	H
Resource Protection Action Plan							
Strategy RP.1 - Identifying & Assessing Current and Emerging Issues							
(1) Develop comprehensive list of issues		◆	□	○	H	H	H
(2) Periodically assess and prioritize current and emerging issues list		◆	□	○	H	H	H
(3) Track emerging issues		◆	□	○	H	H	H
Strategy RP.2 - Responding to Identified Issues							
(1) Consult with the Sanctuary Advisory Council		◆	□	○	H	H	H
(2) Respond to issues		◆	□	○	H	H	H
Strategy RP.3 - General Marine Zoning							
(1) Analyze spatial data		◆	□	◎	H	H	H
(2) Evaluate utility of zoning strategies for the Sanctuary		◆	□	◎	H	H	H

Appendix A1

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Operations Action Plan							
Strategy OP.1 - Sanctuary Advisory Council Operations							
(1) Support the operation and administration of the Advisory Council	◈	□	○	H	H	H	
(2) Improve the effectiveness of the Advisory Council	◈	□	○	M	M	M	
(3) Sponsor Advisory Council-hosted issue forums	◈	□	◉	M	M	M	
Strategy OP.2 - Permitting and Activity Tracking							
(1) Continue careful oversight and issuance of permits	◈	□	○	M	M	M	
(2) Develop a voluntary research registry	◆	□	◉	M	M	M	
(3) Consider developing voluntary registries for other activities	◆	□	◉	L	L	M	
Strategy OP.3 - Relationships With Other Authorities							
(1) Conduct outreach to agencies and stakeholders	◈	□	○	H	H	H	
(2) Comment at public hearings on issues affecting the CINMS	◈	□	○	M	M	M	
(3) Review and comment on relevant plans and projects	◇	□	○	M	M	M	
(4) Enhance partnership with the Channel Islands National Park	◈	□	◉	H	H	H	
(5) Utilize and maintain tools to formalize relationships with other authorities	◇	□	●	M	M	H	

Appendix A1

Table 24. Action Plan Summary Table

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Strategy OP.4 - Vehicle, Boat & Aircraft Operations							
(1) Acquire and maintain Sanctuary vehicles		◇	□	○	H	H	H
(2) Maintain and renovate Sanctuary vessels		◈	□	○	H	H	H
(3) Contract and partner agency aircraft operations		◇	▣	◉	H	H	H
Strategy OP.5 - Administrative Initiatives							
(1) Continue to manage Sanctuary finances		◇	□	○	H	H	H
(2) Ensure a safe and secure working environment		◇	□	○	H	H	H
(3) Work with the NOAA Western Regional Center		◇	□	◉	H	H	H
(4) Identify, prioritize, and fill equipment and service needs		◇	□	○	H	H	H
(5) Enhance partnership with the Channel Islands Marine Sanctuary Foundation		◈	□	●	M	M	M
Strategy OP.6 - Human Resources							
(1) Provide human resources services for staff		◇	□	○	H	H	H
(2) Maintain Sanctuary contracts		◇	□	◉	H	H	H
(3) Identify mechanisms to augment and stabilize paid human resources		◈	□	○	H	H	H
(4) Continue partnership with the NOAA Corps		◇	■	●	H	H	H

Appendix A1

Table 24. Action Plan Summary Table

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					FISCAL YEAR 2005 BUDGET (\$2.3 MIL)	10% ANNUAL FUNDING INCREASE	20% ANNUAL FUNDING INCREASE
Strategy OP.7 - Office Space Expansion							
(1) Participate in building design		◆	■	◎	H	H	H
(2) Assist UCSB with project management during building construction		◆	■	◎	H	H	H
(3) Develop CINMS moving plan and conduct move		◆	■	◎	H	H	H
Strategy OP.8 - Greening Facilities & Operations							
(1) Utilize LEED certified building		◆	■	○	H	H	H
(2) Green Sanctuary vehicle and vessel operations		◆	□	○	M	M	M
(3) Reduce, reuse, recycle.		◇	□	○	H	H	H
(4) Reduce energy consumption.		◇	□	○	H	H	H
Performance Evaluation Action Plan							
Strategy EV.1 - Measuring Sanctuary Performance Over Time							
(1) Monitor existing performance measures consistently over time		◆	□	○	H	H	H
(2) Report results		◆	□	○	H	H	H

Appendix A2: Estimated Costs Per Action Plan

Appendix A2 presents base budget (core operations and programmatic costs) and capital facility estimates for years one through five of this management plan (see Table 25). These estimates help the NMSP allocate funds for CINMS. Due to possible changes in federal funding levels certain Sanctuary programs may require modification or deferred implementation to reflect budgetary changes. “Core operations” costs include: staff and contract labor, training, transportation and travel, utilities, property rental, printing, supplies, equipment, vessels and vessel maintenance. “Programmatic costs” are the additional costs the Sanctuary incurs carrying out the strategies in the action plans.

Table 25. Summary of Estimated Five-Year Costs for Each Action Plan (in thousands)

Action Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Estimated 5 Year Total
Public Awareness & Understanding	\$333.5	\$487	\$534.5	\$465.5	\$447	\$2,267.5
Conservation Science	\$1,951	\$2,238.5	\$2,136	\$2,136	\$2,140	\$10,601.5
Boundary Evaluation	\$0	\$125	\$125	-	-	\$250
Water Quality	\$35	\$63	\$63	\$63	\$63	\$287
Emergency Response & Enforcement	\$38	\$39.5	\$39.5	\$30.5	\$104	\$251.5
Maritime Heritage	\$133.5	\$243	\$102.5	\$76.5	\$82	\$637.5
Resource Protection	-	-	\$10	\$10	-	\$20
Operations	\$322	\$331.5	\$332.5	\$333.5	\$334.5	\$1,654
Evaluation	-	-	-	-	-	-
Estimated Total Per Year	\$2,813	\$3,527.5	\$3,343	\$3,115	\$3,170.5	\$15,969

Note: This table assumes that all actions flagged for capital facilities funding require ALL funding from that source alone.

APPENDIX B: LIST OF ACRONYMS

ARB	Air Resources Board
ASA	Abandoned Shipwreck Act
ATBA	Areas To Be Avoided
CAP	Civil Aeronautical Patrol
CCC	California Coastal Commission
CDFG	California Department of Fish and Game
CEC	Community Environmental Council
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Commission
CIH	Channel Islands Harbor
CIHBISC	Channel Islands Harbor Boating Instruction and Safety Center
CIMSF	Channel Islands Marine Sanctuary Foundation
CINC	Channel Islands Naturalist Corps
CINMS	Channel Islands National Marine Sanctuary
CINP	Channel Islands National Park
CIPE	Center for Image Processing in Education
CMA	Chumash Maritime Association
CMAR	Coastal Maritime Archaeology Resources
CODAR	Coastal Ocean Dynamics Applications Radar
COP	Coastal Ocean Program
COSEE	Centers for Ocean Science Education Excellence
CPFV	Commercial Passenger Fishing Vessel
CRC	Cascadia Research Collective
CREEC	California Regional Environmental Education Community
CSC	Coastal Services Center
CSLC	California State Lands Commission
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DAC	Damage Assessment Center
DBW	Department of Boating and Waterways
DEIS	Draft Environmental Impact Statement
DOI	the Department of the Interior
EEZ	Exclusive Economic Zone
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESRI	Environmental Systems Resource Institute
FACA	Federal Advisory Committee Act
FAP	Federal Archaeological Program
FEIS	Final Environmental Impact Statement
FMP	Fishery Management Plans
FTE	Full Time Equivalent
GAFC	Great Annual Fish Count
GIS	Geographic Information System
GPS	Global Positioning System
GSA	General Services Administration

HRC	(California) Historical Resources Commission
IMO	International Maritime Organization
LAUSD	Los Angeles Unified School District
LiMPETS	Long Term Monitoring Program and Experiential Training for Students
MBNMS	Monterey Bay National Marine Sanctuary
MHR	Maritime Heritage Resource
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPWC	Motorized Personal Watercraft
MRWG	Marine Reserve Working Group
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NASA	National Aeronautic and Space Administration
NCCOS	National Centers for Coastal Ocean Science
NEPA	National Environmental Policy Act
NERRS	National Estuarine Research Reserve System
NESDIS	National Environmental Satellite and Data Information Service
NGO	Non-governmental organization
NGS	National Geographic Society
NHPA	National Historic Preservation Act
nmi	Nautical mile
NMSA	National Marine Sanctuaries Act
NMSF	National Marine Sanctuary Foundation
NMSP	National Marine Sanctuary Program
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NSDI	National Spatial Data Infrastructure
NSF	National Science Foundation
NSP	Nonpoint Source Pollution
NWS	National Weather Service
OAR	(Office of) Oceanic and Atmospheric Research
OCNMS	Olympic Coast National Marine Sanctuary
OCRM	Office of Coastal Resource Management
OCS	Outer Continental Shelf
OLE	Office for Law Enforcement
ONR	Office of Naval Research
OR&R	Office of Response and Restoration
OSPR	(Office of) Oil Spill Prevention and Response
PFMC	Pacific Fishery Management Council
PISCO	Partnership for Interdisciplinary Study of Coastal Oceans
RAIN	Regional Alliance for Information Networking
REEF	Reef Environmental Education Foundation
ROV	Remotely Operated Vehicle
RWQCB	Regional Water Quality Control Board
SAC	Sanctuary Advisory Council
SAMSAP	Sanctuary Aerial Monitoring and Spatial Analysis Program

SBCC	Santa Barbara City College
SBCS	Santa Barbara County Schools
SBMM	Santa Barbara Maritime Museum
SBMMC	Santa Barbara Marine Mammal Center
SCB	Southern California Bight
SCCWRP	Southern California Coastal Water Research Project
SDEIS	Supplemental Draft Environmental Impact Statement
SeaWiFS	Sea-Viewing Wide-Field-of-Vision Sensor
SEIS	Supplemental Environmental Impact Statement
SET	Sanctuary Education Team
SMP	Supplemental Management Plan
SPO	Special Projects Office
SWMEA	Southwestern Marine/Aquatic Educators Association
SWRCB	State Water Resource Control Board
TSS	Traffic Separation Scheme
UCSB	University of California at Santa Barbara
UCSB-MSI	University of California at Santa Barbara-Marine Science
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VAFB	Vandenberg Air Force Base
VTSS	Vessel Traffic Separation Scheme
WRAD	Western Regional Acquisition Division
WRC	Western Regional Center
WOW	Waves on Wheels

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APPENDIX C: SUMMARY OF CHANGES BETWEEN DRAFT AND FINAL

This appendix summarizes changes Sanctuary staff have made to the management plan between its draft and final versions. In general, changes reflect input received from public comments, revisions to grossly outdated information, and corrections of minor typographical, technical, and formatting errors. Changes are summarized below by section. Details regarding changes made per responses to individual public comments are available in Vol. II, Appendix B.

General Changes

NOAA made the following changes wherever relevant throughout the document:

- Removed references to this document as a draft;
- Updated the technical description of the Sanctuary area as 1110 square nautical miles;
- Clarified that Native American artifacts found in the Sanctuary are Chumash artifacts, and clarified that Chumash people and culture are present today, not only in history;
- Wherever types of maritime heritage resources were listed, listed them in the order of Chumash artifacts, paleontological artifacts, then historic artifacts;
- Removed the term “discovery” from references to Juan Rodriguez Cabrillo’s 1542-1543 voyage;
- Used consistent terminology to refer to the Channel Islands MPA network of marine reserves and conservation areas;
- Removed outdated information and photographs referring to the Los Marineros program, and where appropriate noted that this program ended in 2005;
- Changed references to “weather kiosks” or “information kiosks” to the term used to describe the current generation of Sanctuary kiosks: “interactive kiosks”;
- Changed remaining references to the Sanctuary “manager” to the Sanctuary “superintendent”;
- Removed references to Washburn and Clark (1998);
- Removed outdated statements indicating that the oldest human remains found in North America were found on Santa Rosa Island;
- Clarified that three oil and gas lease units overlap the Sanctuary;
- Changed references to “biogeographic provinces” and “biogeographical provinces” to “bioregions”;
- Noted that there are now nine, not ten action plans;
- Corrected and updated figure and table numbering; and
- Omitted references to Vol. II, Appendix B for the NMSA (no longer housed there)

NOAA has not noted each instance of these general changes in the subsequent list of specific changes made to each document section.

Executive Summary

- Added information on the steps taken to develop the management plan between draft and final stages; and
- Revised list of Management Strategies by Action Plan to reflect changes made to action plans and strategies

Section I: Introduction

- Updated text and figures referring to the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve to reflect that this area is now the Papahāunamokuākea Marine National Monument;
- Added information to explain that the NMSP is administered by the NOAA Ocean Service Office of National Marine Sanctuaries;
- Added NMSP mission statement and program-wide goals;
- Clarified that the NMSA purposes and policies listed are complete and verbatim;
- Added information to explain NOAA's ecosystem approach to management, and replaced external source definition of ecosystem management with NOAA's more recent definition of an ecosystem approach to management;
- Replaced Figures 4 and 5 with updated maps designed for increased legibility, and depicting Sanctuary boundaries revised in 2007 per the federal portion of the MPA network;
- Clarified that the EIS focuses on presenting and analyzing potential changes to Sanctuary regulations;
- Added information to explain development of current Sanctuary goals and how they relate to 1983 goals, and refined language of goals to more closely mirror NMSA language;
- Added information on the steps taken to develop the management plan / environmental impact statement between draft and final stages, including development of the SDEIS on regulation of sewage and graywater discharges from vessels 300 GRT or more;
- Clarified that Sanctuary staff worked with the Sanctuary Advisory Council to determine the boundaries of the final management plan study area after reviewing Dr. Michael McGinnis' study area recommendations;
- Clarified that there are two bioregions represented in the study area, along with a transition zone between the two; and
- Added that the Sanctuary has collected scientific data not only from individual researchers and institutions, but also from state and federal agencies

Section II: The Sanctuary Setting

Part II-A: The Physical Setting

- Added references to CDFG (2002) and NCCOS (2005) for details on the physical and biological setting of the Sanctuary;
- Replaced Figure 7 with updated map designed for increased legibility, and depicting Sanctuary boundaries revised in 2007 per the federal portion of the MPA network; added in-text reference to the figure;
- Augmented information about regional upwelling;
- Clarified that there are two bioregions represented in the study area, along with a transition zone between the two, and added details about the bioregions and transition zone; and
- Revised references to the NCCOS biogeographic assessment to reflect that NCCOS has completed this work (as of 2005)

Part II-B: The Biological Setting

- Updated and added information about termination of the sea otter translocation program

Part II-C: The Human Setting

- Refined text provided under the sub-header Archaeological and Paleontological Artifacts;
- Adding a sub-section on Chumash Cultural Activities to the Current Human Activities section;
- Updated data and reference in the overview of recreational activities;

- Added informational updates on the status of commercial prawn trawl fisheries;
- Updated data on ex-vessel value of CINMS commercial catch, and noted that values are averages;
- Updated section on kelp harvesting to reflect that this practice ceased in the Sanctuary region in 2005;
- Noted that the 1969 oil spill was “significant” instead of “catastrophic”;
- Referred to the FEIS for information on the status of oil and gas leases, rather than summarizing their status here;
- Updated Table 2 with MMS information about over 30 publications on oceanography research in the Santa Barbara Channel; and
- Replaced Figure 19, featuring the now defunct Los Marineros program, with a recent photo from the MERITO program

Part II-D: The Operational Setting

- Refined language explaining the role of the Sanctuary Superintendent with minor revisions;
- Added tribal agencies to the list of agencies with which the Superintendent coordinates on-site activities;
- Revised Figure 20 to reflect recent changes to the CINMS Organizational Chart;
- Updated information about Sanctuary vessels and aircraft to reflect that the NOAA-64 seawolf amphibious aircraft is no longer stationed at CINMS, and with specifications about the new vessel acquired in 2008;
- Clarified that the NOAA Corps subsidizes rather than pays for salaries of NOAA Corps officers serving Sanctuary billets;
- Replaced Figure 22 with updated map designed for increased legibility, and depicting Sanctuary boundaries revised in 2007 per the federal portion of the MPA network; added in-text reference to the figure;
- Removed information about CINMS currently working with the PFMC on the MPA network environmental review process, a process that is now complete;
- Added a sub-section on Tribal Agencies and Organizations to the Relationships With Other Regional Authorities section;
- Refined language explaining the USCG with minor non-substantive changes;
- Clarified that MMS regulates, rather than manages the nation’s oil and natural gas resources;
- Made description of Sanctuary permit types broad and general, and referred to the CFR for Channel Islands permit regulations, rather than trying to summarize them in text since they will be changing; and
- Revised language about permits previously referred to as “manager’s permits,” to explain that there is another permit type for otherwise prohibited activities that would further Sanctuary management purposes, but that would not fall into any other existing permit category

Section III: Action Plans

General

- Revised the “Addressing the Issues – Regulations” section at the end of each action plan to provide a general description of current, relevant Sanctuary regulations, and to refer to the Code of Federal Regulations for the actual regulatory language

Background

- Revised footnote to explain that while staff did not include either sea otters or MPAs on the list of ten priority issues to be addressed in the management plan, both are discussed in the Resource Protection Action Plan;

- Revised list of action plans to reflect changes made to action plans: NOAA has consolidated elements of the Marine Zoning and Emerging Issues action plans into what is now a Resource Protection Action Plan;
- Added explanation that each activity description includes information about the status of the activity, and partners involved in it; clarified what the “status” and “partners” descriptions following each activity mean;
- Added a Framework for Determining When the Sanctuary Should Develop Additional Action Plans; and
- Revised Table 3 to reflect changes to action plans and strategies

Public Awareness & Understanding Action Plan

- Added background on current population growth and cultural diversity statistics on Latino K-12 student enrollment;
- Clarified that the Sanctuary evaluates its education programs and that performance measures are located in the evaluation action plan, and noted the NMSP program-wide education performance measure about assessing all education programs in sanctuaries for effectiveness by 2010;
- Corrected Figure numbering for Figure 26 (now Figure 28) on K-12 education, and replaced old image with a recent education photograph;
- Strategy AU.1: added information about the “Teacher At Sea” program to activity (1);
- Strategy AU.1: added information about the B-WET grant program to activity (2);
- Strategy AU.1: updated information about the Waves on Wheels mobile van program in activity (6);
- Strategy AU.2: updated statistics about Channel Islands Naturalist Corps volunteer service hours;
- Strategy AU.2: updated activity (2) with information about the From Shore to Sea lecture series, and partnerships with Channel Islands National Park, and the Santa Barbara Maritime Museum;
- Strategy AU.2: added information to activity (3) about the Sanctuary-Park MOA for a volunteer administrative support position;
- Strategy AU.2: added information to activity (4) to reflect that the REEF program now includes a marine invertebrate component;
- Strategy AU.2: added information to activity (5) about the Hollings scholarship, and internship opportunities for underrepresented youth;
- Strategy AU.3: added information to activity (1) about volunteers collecting data for the marine mammal sightings database, updated volunteer program statistics, and added detail about the CINMS agreement with vessel operators;
- Strategy AU.3: added information to activity (3) about VolunteerNet;
- Strategy AU.3: improved and updated explanation in activity (4) about the ocean etiquette program;
- Strategy AU.4: revised objective to read “timely” instead of “immediate” and “accurate” instead of “direct”;
- Strategy AU.4: revised background to more accurately reflect the types of advanced outreach technology the Sanctuary will use to engage audiences, and more recent Sanctuary website visitor statistics;
- Strategy AU.4: updated activity (1) list of multi-media elements CINMS will incorporate into its website;
- Strategy AU.4: Updated and expanded explanation of Sanctuary interactive kiosk program in activity (2);
- Strategy AU.4: updated activity (3) to reflect the Oceanslive! telepresence program, and partnership with the Ventura County Office of Education;

- Strategy AU.4: replaced Figure 30 (now 32) with a more recent image of the CINMS website home page;
- Strategy AU.5: added information about the Sanctuary's Ventura County Regional Office;
- Strategy AU.6: updated activity (1) to reflect current list of print publications the Sanctuary maintains;
- Strategy AU.6: updated activity (2) Mountains to Sea educational material information;
- Strategy AU.6: updated activity (3) to reflect current list of outreach materials the Sanctuary maintains;
- Strategy AU.6: updated activity (5) with additional details about the outreach events in which the Sanctuary participates;
- Strategy AU.7: revised activity (1) to reflect that the Santa Barbara Maritime Museum has been a partner in the Outdoors Santa Barbara Visitor Center since 2007;
- Strategy AU.7: revised activity (5) to clarify that the Sanctuary will work with the Southcoast Watershed Resource Center, and added Art From Scrap as a partner in this endeavor;
- Strategy AU.7: revised activity (7) to reflect that Congress awarded \$3 million in funds for OCTOS;
- Strategy AU.8: removed background information about the process to establish the MPA network;
- Strategy AU.8: replaced Figure 33 (now 35) with images of recent MPA outreach products;
- Strategy AU.8: omitted the activity about developing a PSA, which the Sanctuary no longer plans to do;
- Strategy AU.8: revised activity (5), which is now (4), to reflect that the Sanctuary is developing interpretive signs and kiosks as part of the California National Marine Sanctuaries Signage Plan;
- Strategy AU.9: revised background and deleted former activity (1) to reflect that CINMS has completed a multicultural education needs assessment;
- Strategy AU.9: deleted former activity (3) to reflect that CINMS has already completed a strategic plan for multicultural education;
- Strategy AU.9: revised activity (2) (previously activity (4)) with current information about youth and adult education programs, including noting that the youth program is called the MERITO Academy; and
- Strategy AU.9: revised activity (3) (previously activity (5)) to reflect that the multicultural education strategy includes increasing knowledge of over fishing and global warming issues, in addition to fostering Sanctuary stewardship and increasing knowledge of water quality issues and promoting environmentally responsible living

Conservation Science Action Plan

- Revised the Overview with minor language refinements, and to clarify the purpose of conservation science, research and monitoring, and the role of the Sanctuary's research department;
- Revised the Description of the Issues section by: adding a summary list of management issues that will be informed by the work embodied in the Conservation Action Plan; deleting the background information and text box on socioeconomics;
- Added several strategies from the Resource Protection and Operations action plans to the list of strategies under the "Addressing the Issues – Strategies From Other Action Plans" section;
- Strategy CS.1: revised the background to provide more information about what SAMSAP is and its purpose;
- Strategy CS.1: revised to reflect that the Sanctuary no longer has the Lake Renegade Seawolf aircraft;

- Strategy CS.1: omitted information about monthly kelp canopy surveys, and clarified that SAMSAP data can include observed oil (but not oil types as previously stated);
- Strategy CS.1: revised activity (2) to reflect that the Sanctuary no longer plans to develop a data encyclopedia, but rather will produce data and trends analysis, and to omit information about kelp canopy data;
- Strategy CS.1: revised Figure 35 (now 37) caption to reflect that the Sanctuary uses NOAA or contracted aircraft for SAMSAP;
- Strategy CS.2: revised background and activity (1) and omitted activities (3) and (4) to reflect that the Sanctuary plans to use existing regional and national data management programs rather than developing its own such tools or programs;
- Strategy CS.2: revised activity (2) to reflect that, as previously stated in activity (4), all spatial data will be standardized according to NSDI format; to note that CINMS will ensure that all data sets are up to date with current metadata; and to clarify the data types relevant to this activity;
- Strategy CS.2: replaced Figure 36 (now 38) with a more legible Sanctuary GIS image;
- Strategy CS.3: rephrased the title and removed “Existing” from it;
- Strategy CS.3: refined background explanation and added information about how conservation science research and monitoring relate to emerging issues and adaptive management, and clarified that the Sanctuary evaluates research priorities on an annual basis;
- Strategy CS.3: reordered list of activities;
- Strategy CS.3: revised activity (3), now (1), by broadening it to include descriptions of several monitoring activities the Sanctuary helps support;
- Strategy CS.3: revised activity (2), now (3), to improve the description of and add more details about seabird studies;
- Strategy CS.3: added examples of site characterization research projects, and clarified that the Sanctuary evaluates research priorities on an annual basis, which allows for inclusion of projects addressing emerging issues;
- Strategy CS.3: added new activity (5) describing staff and partner efforts to develop a carbon budget for the Sanctuary;
- Strategy CS.4: added that the objective of the collaborative marine research project includes to obtain rigorous scientific data on issues of concern to scientists, agencies, and fishers;
- Strategy CS.5: updated activity (1) by omitting SIMoN system development and maintenance, by adding information about Sanctuary Wide Monitoring (SWiM) reporting requirements, and adding current information about the status of Sanctuary staff efforts to interpret and disseminate Sanctuary research findings and about current partners in this effort;
- Strategy CS.5: revised activity (3) by broadening title, noting that researchers are invited to share their findings at monthly From Shore to Sea lectures and at Advisory Council meetings, adding that Sanctuary staff will present information at scientific conferences and workshops, and omitting text about the annual research report since this is already included in activity (1);
- Strategy CS.5: updated status of activity (4);
- Strategy CS.6: in general, revised the strategy so that it focuses exclusively on biological monitoring of the MPA network, and added a new strategy (CS.7) to house information on socioeconomic monitoring of the MPA network;
- Strategy CS.6: revised background by omitting MRWG monitoring recommendations, clarifying what guides the nearshore and deepwater MPA network monitoring, reflecting that full MPA network is now complete, and providing a map of the MPA network;
- Strategy CS.6: revised activity (1) by listing the ROV project as an example of a biological monitoring program that contributes to understanding the effectiveness of the MPA network, and by reflecting that Sanctuary staff will participate in periodic symposia and reporting on MPA network effects rather than hosting an annual meeting;

- Strategy CS.6: moved activity (2) to Strategy CS.7 activity (1); updated the activity description to reflect that CINMS will work with partners to implement the socioeconomic monitoring plan, rather than referring to the general Channel Islands Marine Protected Areas Monitoring Plan;
- Strategy CS.6: added a new activity (3) on developing a deep water monitoring plan;
- Strategy CS.7: this is a new strategy summarizing the Sanctuary's (2007) socioeconomic monitoring plan, with one activity being to implement that plan;
- Strategy CS.8: this is a new strategy describing how the Sanctuary collects and utilizes data from a vessel tracking Automated Identification System (AIS); and
- Table 5: updated costs to reflect changes made in strategies, most significantly by increasing the costs for Strategy CS.6 to reflect costs of deep water monitoring

Boundary Evaluation Action Plan

- Revised the Description of the Issues section on scoping comments to reflect the number of comments that did not support boundary expansion;
- Revised the Description of the Issues section on determining a study area boundary to reflect that there are two bioregions in the Sanctuary and a transition zone between them (instead of three biogeographic provinces), and clarified that Sanctuary staff worked with the Sanctuary Advisory Council to determine the boundaries of the final management plan study area after reviewing Dr. Michael McGinnis' study area recommendations;
- Updated the Description of the Issues section on NOAA's decision to continue boundary analysis by noting that NCCOS completed the biogeographic assessment in 2005 and NOAA will incorporate the results of this assessment into the supplemental environmental review process on boundaries;
- Updated the Addressing the Issues – Strategies For This Action Plan section by omitting the strategy aimed at completing the biogeographic analysis;
- Strategy BE.1: deleted the original strategy about completing the NCCOS biogeographic assessment (completed in 2005); and
- Strategy BE.2: this is now Strategy BE.1

Marine Zoning Action Plan

- Deleted this action plan, but incorporated Strategy MZ.1 on general marine zoning into the new Resource Protection Action Plan;
- Strategy MZ.1 (now RP.3): revised the background to: clarify that the Sanctuary has used zones since 1980 to separate competing human uses, or address uses incompatible with resource protection; to reflect that the MPA network is complete; to add clarification and details about the types of zones in the Sanctuary that are managed by other agencies; to add the information on issues that have led the Sanctuary to consider various new marine zones (from the Marine Zoning Action Plan Description of the Issues); and to clarify that using baseline data the Sanctuary will be able to adaptively manage existing zones;
- Strategy MZ.1 (now RP.3): updated activity (2) by omitting a statement about ongoing activities related to consideration of federal marine reserves and conservation areas;
- Strategy MZ.1 (now RP.3): added strategies CS.5 and OP.8 to the Addressing the Issues – Strategies From Other Action Plans section; and
- Replaced Figure 41 (now Figure 51) in the Resource Protection Action Plan) with an updated map depicting the completed MPA network

Water Quality Action Plan

- Revised the Overview by: adding information about NMSP-wide performance measures pertaining to water quality; adding a paragraph with information about how staff will implement

this action plan and the status of the West Coast Region Water Quality Coordinator position; added a section on recent water quality work in the Sanctuary conducted by the Sanctuary Advisory Council and other Sanctuary partners;

- Revised the Description of the Issues: noted that effluents may introduce disease-causing microorganisms (pathogens), such as bacteria, protozoans, and viruses, into the marine environment; noted that power plant impacts on marine organisms may include entrainment through cooling water systems; updated information in footnotes about the volume of municipal wastewater discharge comprised of surface runoff, about the Goleta Sanitary District upgrading to full secondary sewage treatment, and about effluent discharges allowed from oil and gas platforms in federal and state waters; removed “trash” from the list of pollutant discharges associated with routine operations of oil and gas development; added a paragraph on oil and gas seeps; added information to the section on vessel discharge and deposit to describe the potential impacts of such discharges, including graywater; added information about vessel accidents to the section formerly focused on discharge/deposit from shipwrecks; and updated the section on community involvement to reflect that the Advisory Council completed a water quality needs assessment in 2005;
- Strategy WQ.1: revised the background to note that CINMS participates in several ongoing water quality monitoring efforts described within this strategy; to update information about the Santa Barbara Channelkeeper pilot monitoring project conducted from 2005 through 2007; and to add information about developing a water quality protection plan and how the Advisory Council’s 2005 report will help in this regard;
- Strategy WQ.1: revised activity (2) to note that Sanctuary staff were involved in planning for Bight ’08;
- Strategy WQ.1: added a new activity (3) on continuing support for CINMS water quality initiatives;
- Strategy WQ.2: in general, revised the strategy to omit references to the West Coast Water Quality Coordinator, to where appropriate note that Sanctuary staff will partner and work with the West Coast Region, and to reflect that the Advisory Council completed a water quality needs assessment in 2005;
- Strategy WQ.2: added a new activity (1) on completing the water quality characterization report, and renumbered the original activities accordingly; and
- Strategy WQ.2: added Strategy CS.8 to the list of strategies under the header Addressing the Issues – Strategies From Other Action Plans

Emergency Response & Enforcement Action Plan

- Revised the Description of the Issues as follows: refined the description of oil and gas leases in the Channel Islands Region and overlapping the Sanctuary; added references to support the statements about the effects of oil on marine organisms; clarified that lighter hydrocarbons “may” enter the bloodstream; added references and refined the description of the impacts of the 1969 oil spill in the Unocal Spill of 1969 text box;
- Strategy EE.1: revised the objective to include human initiated disasters;
- Strategy EE.1: revised the background as follows: deleted information about assistance from NOAA’s Office of Response and Restoration; added list of various federal, state and local emergency response agencies in California the Sanctuary will cooperate with in implementing an emergency response plan; added a new paragraph describing the area contingency plan (ACP); added a new paragraph describing the roles of CINMS and the Federal On Scene Coordinator;
- Strategy EE.1: updated activity partner lists and clarified that the NOAA partner is NOAA HAZMAT instead of NOAA OR&R;
- Strategy EE.1: omitted from activity (3) the minimum number of volunteers to be trained; and

- Strategy EE.1: revised activity (5) by deleting the statement about identifying oil types in the discussion about using GPS, survey software, and GIS; and by replacing information about prototyping a cellular telephony program, with information about updating SAMSAP software

Maritime Heritage Action Plan

- Changed the action plan title from “Maritime Heritage Resources Action Plan” to “Maritime Heritage Action Plan” and changed strategy titles accordingly from “MHR...” to “MH...”;
- Refined language in the Overview and Description of the Issues, and to the latter added a list of reasons for removing artifacts and refined the description contained in the sub-section on Contemporary Native American Culture;
- Strategy MH.4: added information to the Background and a new activity about protection and handling of Chumash artifacts; deleted the activity focused on establishing a shipwreck trail guide and mooring system; and
- Strategy MH.6: revised strategy title to “Supporting Public Education of Chumash Native American Maritime Heritage”; revised the strategy objective to clarify that it is to assist the Chumash community in their cultural revitalization and related efforts pertaining to their traditional maritime heritage; revised the Background to emphasize the CINMS’s supporting role, and that this strategy is focused on education about maritime aspects of Chumash heritage; revised activity (1) to emphasize CINMS’s supporting role in Chumash-initiated watercraft journeys and excursions; deleted activities (2) and (3) and replaced them with a general activity about working with the Chumash community to identify mutual objectives and activities for supporting public education about Chumash maritime heritage

Emerging Issues Action Plan / Resource Protection Action Plan

Note: the list of changes summarized below represent changes made to text of the former Emerging Issues Action Plan, which has been absorbed into the new Resource Protection Action Plan (except where noted otherwise).

- In general, revised text to emphasize that this action plan focuses on current and emerging resource protection issues, not only on emerging issues;
- Revised the Overview to clarify that the action plan prescribes a framework for addressing issues, documents issues the Sanctuary is currently tracking, and describes the tools CINMS staff will apply to address such issues; also noted that the research program informs resource protection, and omitted phrase about issues within and adjacent to the Sanctuary;
- Revised the Description of the Issues as follows: refined the explanation of “emerging” resource protection issues and added a text box on open ocean aquaculture; noted the role of monitoring programs, and the Sanctuary Advisory Council and Research Activities Panel in addressing emerging issues; reorganized the subsections on specific issues alphabetically; updated and added details to the description of each issue, including noting that the Advisory Council adopted reports and recommendations on aquaculture and anthropogenic noise, and adding information on NMSP policy statements relevant to a given issue; changed the section on “Acoustics” to “Human-Induced Acoustic Impacts”; added sections on energy development, climate change, limited spatial data on Sanctuary resources and use, motorized personal watercraft (text taken from Marine Zoning Action Plan), termination of the sea otter translocation program, and wildlife disturbance caused by artificial lighting; and removed the brief section on “additional issues” that listed several issues now described in the newly added sections;
- Added strategies CS.5 and OP.8 to the list of strategies under the “Addressing the Issues – Strategies From Other Action Plans” section, and deleted Strategy MZ.1 since its text is now included in this action plan as Strategy RP.3;

- Strategy EI.1 (now RP.1): updated activity (3) to note that it is about revising and evaluating, rather than developing, the list of current and emerging resource protection issues;
- Strategy EI.1 (now RP.1): revised activity (2) to include among the listed criteria assessing whether the Sanctuary has the jurisdiction and/or authority to address a given issue; and to add that issue prioritization should be and is informed by Advisory Council working groups in general (not just the RAP), along with scientific experts and staff assessments;
- Strategy EI.1 (now RP.1): revised activity (3) to specify that Sanctuary staff will track potential emerging issues that become priorities for action, and that they will seek and review input from researchers and others;
- Strategy EI.2 (now RP.2): refined and simplified language in background section about the Sanctuary being affected by a complex and dynamic state of affairs;
- Strategy EI.2 (now RP.2): revised activity (1) to note that Sanctuary staff not only will inform, but they will also be informed by the Sanctuary Advisory Council about issues;
- Strategy EI.2 (now RP.2): added to the last bullet under activity (2) on formation of action plans a new bullet on proposing new CINMS regulations, and a note about the framework for determining when to develop new action plans in the Action Plans – Background section, and an acknowledgement that new action plans for resource protection issues may include research activities; and
- (For changes to text of Strategy RP.3 please refer above to changes made to Marine Zoning Action Plan Strategy MZ.1)

Operations Action Plan

- Revised the Description of the Issues section by: including evaluating and minimizing environmental impacts of Sanctuary facilities and operations in the bullet list of additional operational issues recognized by the Advisory Council, CINMS and NMSP headquarters staff; noting in the Improving Sanctuary Facilities sub-section that some Sanctuary staff work from an office building in downtown Santa Barbara; added a new sub-section on Greening Sanctuary Facilities and Operations;
- Added RP.2 to the list of strategies under the “Addressing the Issues – Strategies From Other Action Plans” section;
- Strategy OP.1: changed the objective statement’s characterization of the Advisory Council’s role in advising the Sanctuary from that of a “leading” role to an “important” role;
- Strategy OP.2: revised the objective so it is not only to ensure that information gained through research, education, salvage, and management activities conducted in the Sanctuary benefits CINMS programs and/or natural resources, but also to ensure that it informs Sanctuary management;
- Strategy OP.4: updated the background to reflect the current number of vehicles and vessels the Sanctuary currently maintains in its fleet, and that the Sanctuary used contract aircraft on an as-needed basis (rather than maintaining its own aircraft);
- Strategy OP.4: added to activity (1) information about the VCO’s responsibilities to ensure vehicles are kept in a safe and operable condition, and that all federal regulations are followed regarding appropriate use of government vehicles; and added GSA as a partner;
- Strategy OP.4: greatly updated activity (2) with information on current staffing requirements for the Sanctuary’s vessels (including the Xantu vessel acquired in 2008), and the vessel allocation process;
- Strategy OP.5: revised activity (3) to reflect that this activity calls for working with NOAA’s Western Regional Center instead of the now defunct Western Administrative Support Center;
- Strategy OP.6: revised the partner list in activities (1) and (2) to reflect that the Western Regional Acquisition Division (WRAD) is now a partner (instead of WASC);

- Strategy OP.6: added UCSB to the list of partners that may provide support for Sanctuary-related programs and projects;
- Strategy OP.6: refined activity (4) description of the NOAA Corps program to clarify that the National Ocean Service in addition to the NOAA Corps subsidizes, rather than pays for, salaries and benefits of NOAA Corps officer working at the Sanctuary;
- Strategy OP.7: updated and refined the background information on sources and amounts of funding for CINMS office space and the Outreach Center for Teaching Ocean Sciences (OCTOS) to be housed at UCSB;
- Strategy OP.7: revised activity (3) to clarify that CINMS may keep some of its office space in the Santa Barbara Harbor; and
- Strategy OP.8: this is a new strategy that explains Sanctuary staff efforts to green Sanctuary facilities and operations

Performance Evaluation Action Plan

- Added to the overview section information about the NMSP's program-wide performance measures, and how site-specific performance measures are designed in part to comport with them;
- Tables 15-23: corrected several objective statements that were not worded exactly as the objective statements are worded at the beginning of each strategy; where changed wording of strategy title and/or strategy objective statements, reflected same changes in the tables; ensured that the second to last column header in each table is consistently labeled as "Performance Measures";
- Table 17, now 16: changed performance metrics for strategy CS.1 from "database of SAMSAP missions" to "Number of SAMSAP flights"; changed performance measures for strategy CS.2 from "CINMS spatial data is NSDI standardized in a readily distributed format" to "CINMS data is publicly available in a web-based data node"; added performance measures and metrics for new strategies CS.7 and CS.8;
- Table 18, now 17: deleted information for former (omitted) Strategy BE.1 about completing the NCCOS biogeographical study (completed in 2005);
- Deleted former Table 19 (NOAA omitted the Marine Zoning Action Plan); information for Strategy MZ.1 is now incorporated into Table 21 under Strategy RP.3;
- Table 21, now 19: changed Strategy EE.1 performance measure "Improved understanding of CINMS role in regional emergency response efforts" to "Full participation in regional emergency response efforts involving the Sanctuary"; and changed performance metric "Frequency of emergency response plan review, evaluation and updates" to "Attendance and participation at ACP meetings, drills, and response events";
- Table 22, now 20: added a metric to Strategy MH.6 on the number of paddling excursions supported;
- Table 23, now 21: adapted Emerging Issues Action Plan table as that for the Resource Protection Action Plan, and added the information for former Marine Zoning Action Plan Strategy MZ.1 into that for Strategy RP.3; changed the metric for Strategy RP.1 to the number of issues tracked;
- Table 24, now 22: changed Strategy OP.4 performance measure "Safety equipment maintained on all vehicles, vessels, and aircraft" to "Proper safety equipment and a safe working environment are maintained on all vehicles, vessels, and aircraft"; and changed metric "Amount of staff personal vehicle use and number of Sanctuary activities canceled due to unavailability of vehicles, vessels and aircraft" to "Number of days government vehicles, vessels and NOAA or other aircraft were needed but unavailable";
- Table 24, now 22: changed Strategy OP.5 metric from "Regularity of and staff..." to "Frequency and staff attendance at safety briefings and trainings";

- Table 24, now 22: changed Strategy OP.6 performance measure “Maintain status-quo staffing needs” to “Maintain staffing at levels necessary to conduct mandated Sanctuary activities”;
- Table 24, now 22: changed Strategy OP.7 metric “Per-person occupancy rate of at least 150 square feet per person in office facilities” to “Average per-person”; and
- Table 24, now 22: added information for new Strategy OP.8

Section IV: Appendices

Appendix A: Action Plan Summary Tables

- Revised Appendix A1 (Table 24) to reflect changes to action plan, strategies, and activities; and updated with current information; and
- Revised Appendix A2 (Table 26, now 25) by deleting information for the Marine Zoning Action Plan (now defunct), and renaming the Emerging Issues Action Plan row to Resource Protection Action Plan

Appendix B: List of Acronyms

- Added “the” into the explanation that “DOI” stands for “the Department of the Interior”;
- Used the nautical mile abbreviation “nmi” instead of “NM”; and
- Deleted “WASC” and added “WRAD” and “WRC”

Appendix C: Existing and Proposed CINMS Regulations / Summary of Changes Between Draft and Final

- Deleted the table on Existing and Proposed CINMS Regulations, and instead use Appendix C to house this summary of changes Sanctuary staff have made to the management plan between its draft and final versions

Appendix D: Supporting Information on Boundary Evaluation

- Revised each boundary concept description with corrected area calculations, and also provided the area of each concept in square miles;
- Boundary Concept 1A: corrected the description by noting that from Santa Barbara Island the boundary then heads north, ending near Point Dume (not Point Mugu);
- Figures 55-60, now 58-63: Sanctuary staff regenerated each map, simplified map legends, depicted consistent information in each map (*i.e.*, boundary concept, management plan study area, Sanctuary boundary, oil platforms, state and federal oil and gas leases, federal oil and gas lease units, counties, select cities, select rivers, select points, watersheds), and revised Sanctuary boundary to depict changes made in 2007 per the federal portion of the MPA network;
- Table 29, now 27: provided corrected area calculations for each boundary concept; and
- Replaced the biogeographic study project summary with the executive summary from the NCCOS published study report

Appendix E: Water Quality Protection Recommendations from the Channel Islands National Marine Sanctuary Advisory Council

- Appendix E was originally the sources consulted, which are now housed in Appendix F, while Appendix E contains the Advisory Council’s 2005 water quality recommendations

Appendix F: Sources Consulted

- Replaced Baird (1990) with Baird (1993);
- Noted that Blake and Lissner (1993) is available from the Minerals Management Service, and the Santa Barbara Museum of Natural History;

- Added: Brownell (1971); California Coastal Commission (1987); Casanova *et al.* (2001); Cicin-Sain and Knecht (2000); Conservation Working Group (2004); Conservation Working Group (2007); County of Santa Barbara Energy Division (2002); Eley (2000); Engle (2006); Evans and England (2001); Geraci (1990); Geraci and St. Aubin (1987); Intergovernmental Panel on Climate Change (2007); Laughlin (1994); Leeworthy *et al.* (2005); McCauley *et al.* (2003); McCrary *et al.* (2003); Mix (1986); NOAA National Centers for Coastal Ocean Science (2005); National Oceanic and Atmospheric Administration (2005); National Research Council (2003); Polgar *et al.* (2005); Polhemus (2006); Reeves (1977); Todd *et al.* (1996); Tinker *et al.* (2006); U.S. Department of the Interior, Minerals Management Service, Pacific OCS Region (2008); U.S. Environmental Protection Agency (2007); U.S. Fish and Wildlife Service (2005); U.S. Geological Survey, unpublished data; Washburn *et al.* (1996); Winant *et al.* (2003); and
- Deleted: Grumbine (1994); Washburn and Clark (1998)

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APPENDIX D: SUPPORTING INFORMATION ON BOUNDARY EVALUATION

This appendix provides supporting information for the Boundary Evaluation Action Plan (Section III). The Sanctuary boundary concepts described below were developed in 2000 and 2001 as preliminary working draft options. They were designed to represent a range of potential modifications to the existing Sanctuary boundary.

The boundary concept maps were developed by CINMS staff working in close public consultation with the Sanctuary Advisory Council. These maps depict working versions, not final versions, of possible boundary alternatives. These concepts will be analyzed in a future supplemental environmental impact statement (SEIS), which will include information from a biogeographic study conducted by NOAA's National Centers for Coastal and Ocean Science. The Executive Summary of the biogeographic study is also presented in this appendix. The forthcoming SEIS will present an analysis of boundary alternatives to the public. Public comments will be solicited and responded to before a decision on boundary change, if any, is made by NOAA in the future.

Boundary Concepts

Boundary Concept 1

Boundary Concept 1 includes the entire management plan study area, plus an additional portion over the Santa Lucia bank. At 6,593 square nmi (8,731 square statute miles or mi), it covers the largest area of all boundary concepts. It encompasses the widest range and variety of habitats. Boundary Concept 1 also encompasses the greatest variety of uses and is adjacent to 150 miles of mainland coastline. Human uses encompassed include oil and gas exploration and development, commercial and recreational fishing, other types of recreation, harbors, watersheds, and military use. There are 39 developed oil and gas leases included within Boundary Concept 1. This is the only boundary concept including coastal areas adjacent to harbors.

Boundary Concept 1A

Boundary Concept 1A encompasses 6,586 square nmi (8,722 square mi). Like Concept 1, it includes examples of the features making this area a unique environment: the conjunction of two bioregions as well as the transition area between the two. It also encompasses a range of human activities as varied as Concept 1, except for the exclusion of offshore oil and gas leases and coastal ports and harbors. As is also the case for Concept 1, the Concept 1A area is noted for encompassing a transition zone between two distinct coastal bioregions, where the cold temperate waters of the California Current flowing from the north meet the warm temperate waters of the of the California Countercurrent. Concept 1A also includes mainland coastal area of approximately 150 miles.

The outer boundary of Concept 1A extends slightly north of Point Sal on the north, extends to include a section west of the coast approximately 80 nmi east to west and 50 nmi from north to south. South of this westernmost section, Boundary Concept 1A encompasses the Santa Barbara Channel and areas from approximately 10 to 20 nmi south of the existing Sanctuary boundary. Moving east south of the existing Sanctuary, Boundary Concept 1A then drops south to include the existing Sanctuary around Santa Barbara Island. The boundary then heads north, ending near Point Dume. The boundaries of Concept 1A were also discreetly drawn around state and federal outer continental shelf (OCS) oil and gas leases. In addition, the boundary as it pertains to ports and harbors uses as a baseline the Colreg Line as currently depicted on nautical charts, with adjustments for harbor construction occurring since the line was drawn.

Boundary Concept 2

Boundary Concept 2 encompasses 4,004 square nmi (5,302 square mi), or 62 percent of Boundary Concept 1. Unlike Concepts 1 and 1A, the mainland coastal component of Concept 2 begins at Gaviota and extends north Point Sal. Thus, Concept 2 is not adjacent to more urbanized areas of the mainland coast. As with Concept 1 and 1A, Boundary Concept 2 also includes a wide diversity of marine habitats and species, and examples of the features making this area a unique environment: the conjunction of two bioregions as well as the transition area between the two.

Boundary Concept 3

Boundary Concept 3 encompasses 2,637 square nmi (3,492 square mi). Concept 3 includes a limited connection to a section of rural mainland coast extending from the southern boundary of Vandenberg Air Force Base south past Point Conception and east past Cojo Anchorage. A distinguishing feature of Concept 3 is the mainland coastal component extends to the coast without overlapping state or federal oil and gas leases, and without adjoining any urban coastal areas.

Boundary Concept 4

Boundary Concept 4 includes only offshore areas, and does not contact the coast. This concept encompasses 2,327 square nmi (3,082 square mi), which is 36 percent of Boundary Concept 1. This concept is only slightly larger than the existing Sanctuary, and features a contiguous connection to Santa Barbara Island.

Concept 4 encompasses a larger area than the existing Sanctuary, providing a contiguous connection between the northern Channel Islands and Santa Barbara Island. As with Concepts 1, 1A, and 2, Boundary Concept 4 includes important offshore physical features, including portions of the Santa Barbara Basin. Concept 4 does not include habitats associated with the mainland coast, such as mainland kelp beds, wetlands, and linkages to coastal watersheds. It includes portions of the gray whale migration route, seabird foraging areas, and other important biological features.

Boundary Concept 5

Boundary Concept 5 encompasses 1,322 square nmi (1,751 square mi) and is closest among the concepts to the existing Sanctuary boundary. Concept 5 essentially squares off the existing curved Sanctuary boundary. Like Concept 4, Concept 5 does not include areas of the mainland coast and its associated coastal features and habitats. Concept 5 includes all the unique island habitats but without the connection to Santa Barbara Island.

Boundary Concept Maps and Data Attribute Tables

Figures 58-63 show the boundaries of each boundary concept. Tables 26 and 27 compare various human use activities and environmental features occurring within each of the boundary concepts.

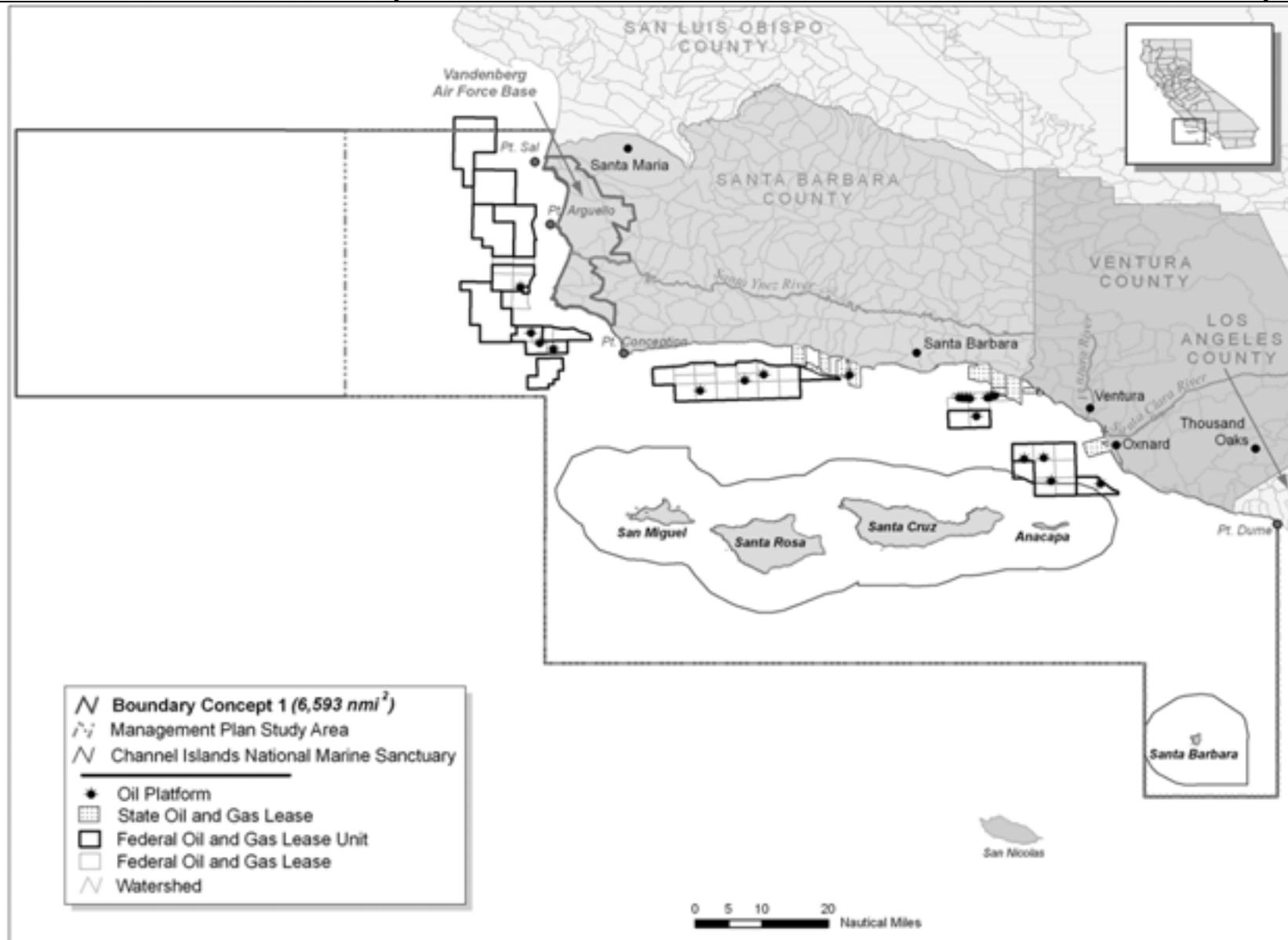


Figure 58. Map of boundary concept 1

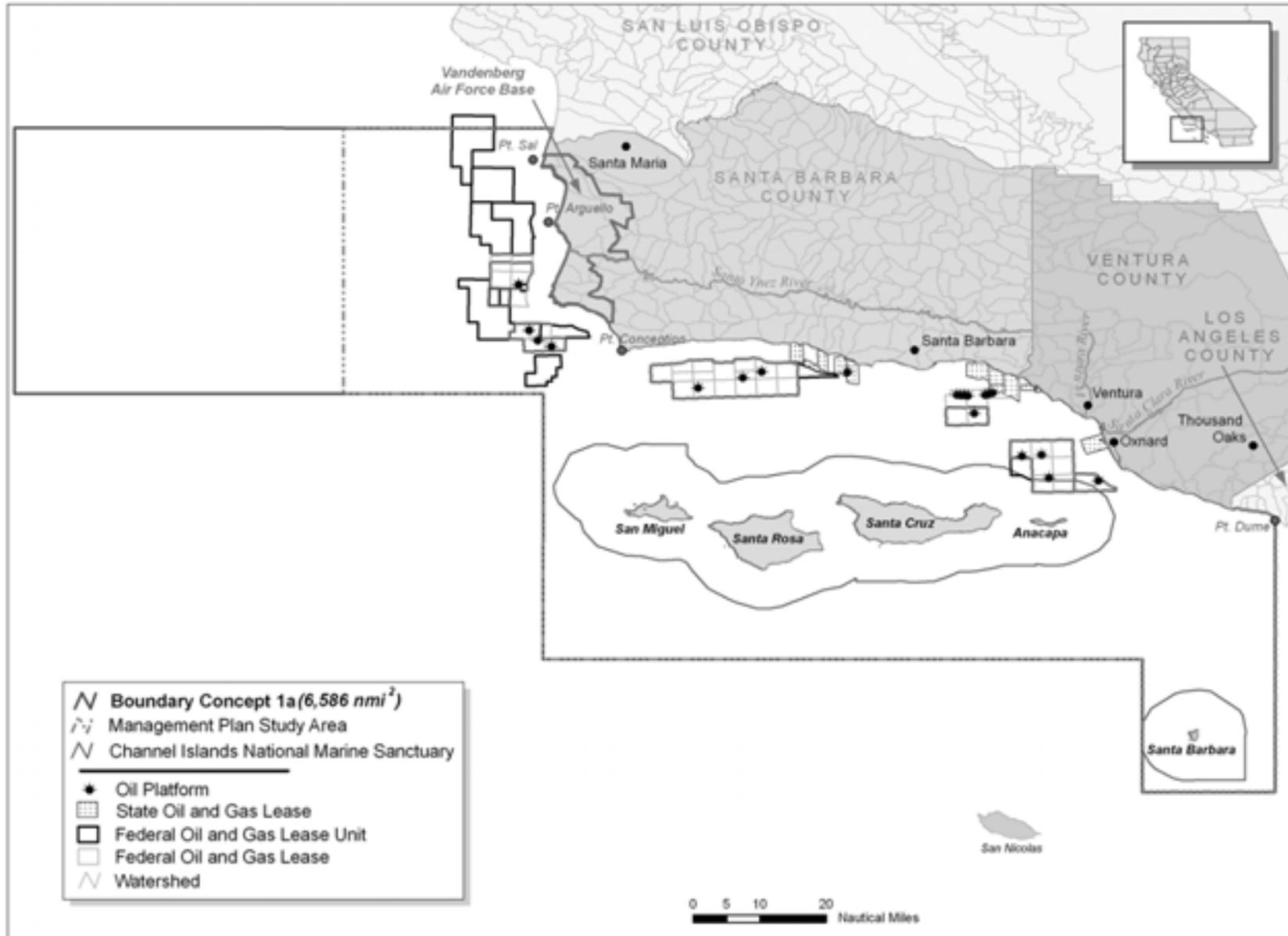


Figure 59. Map of boundary concept 1a

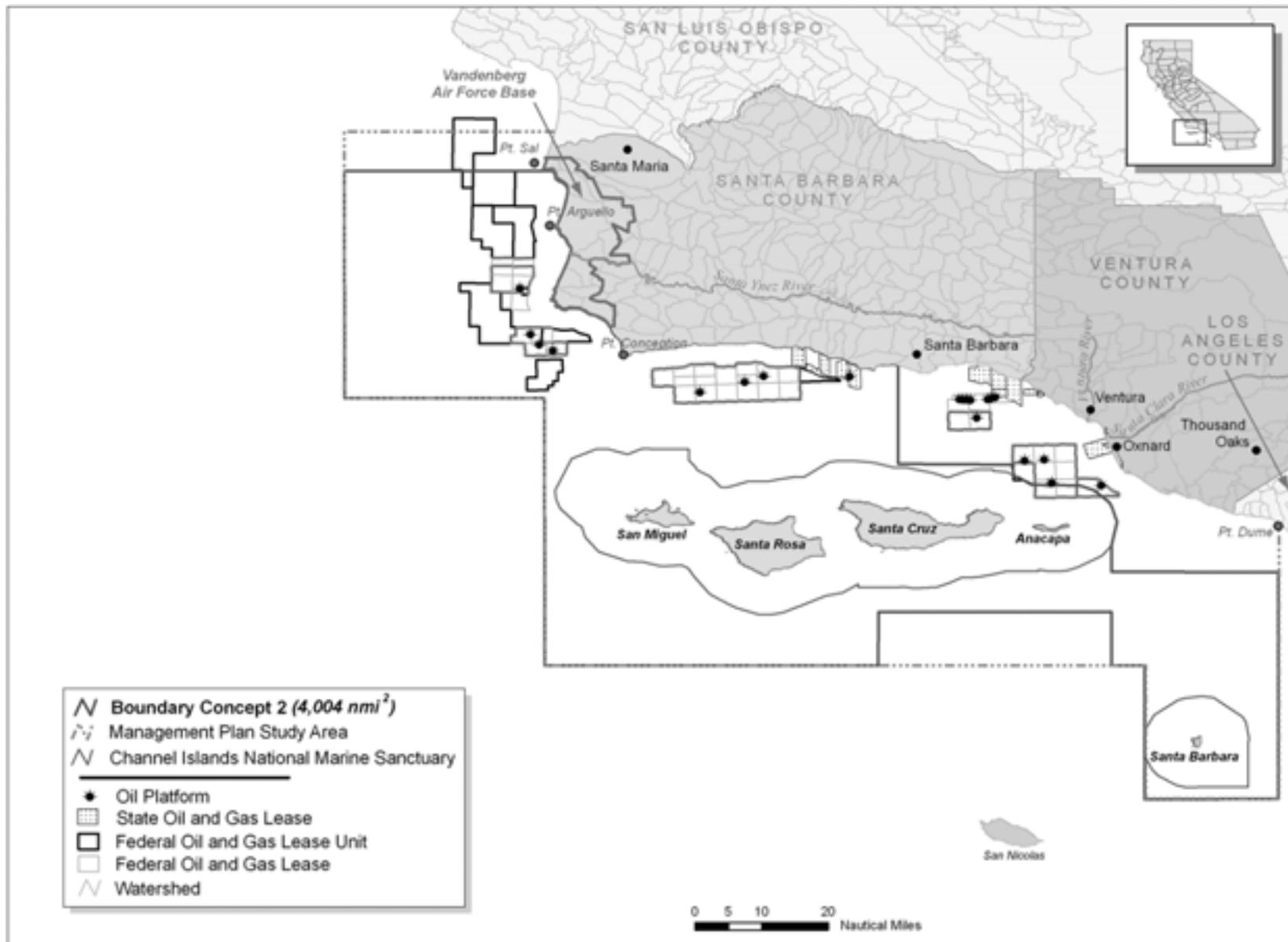


Figure 60. Map of boundary concept 2
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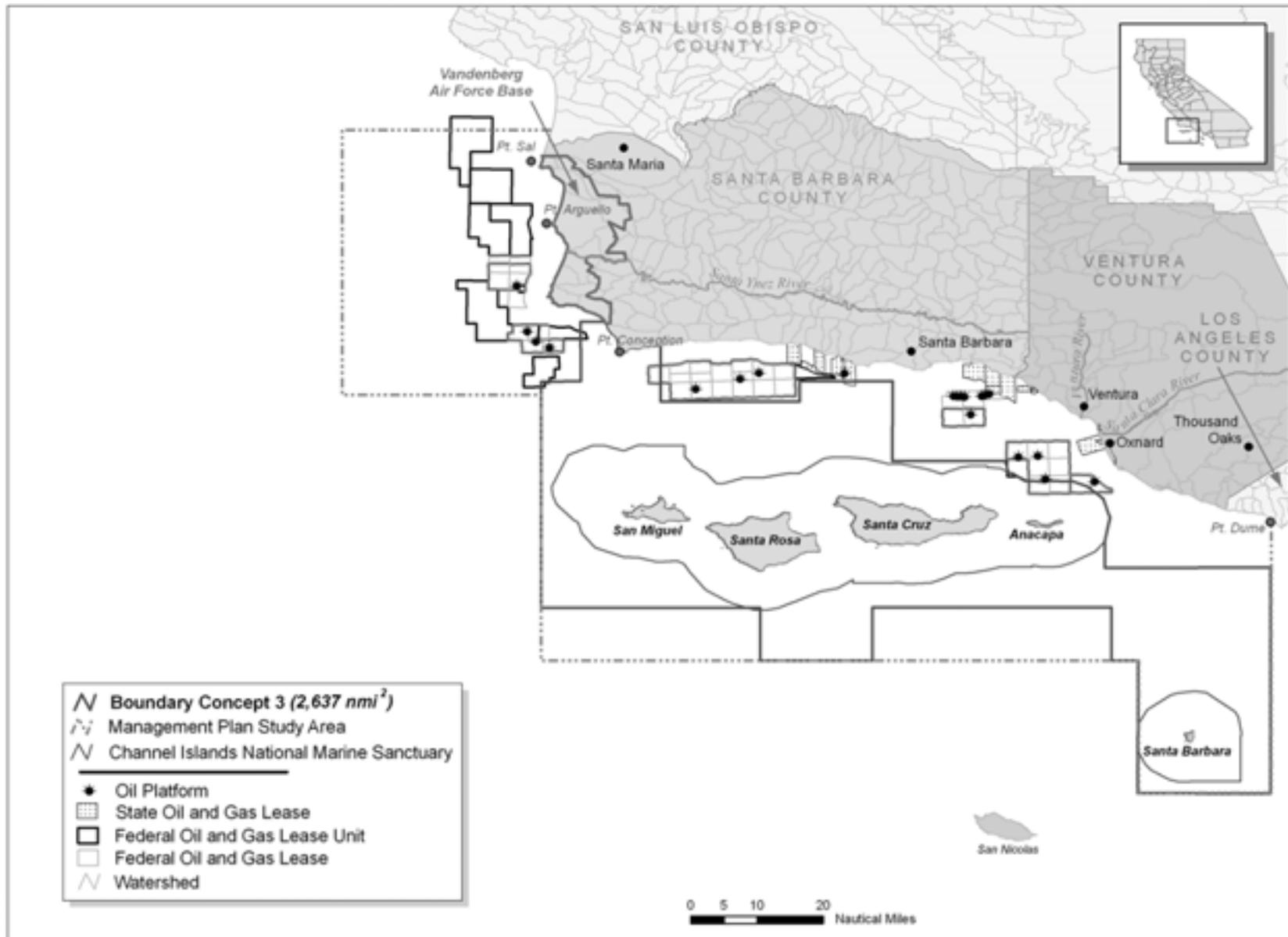


Figure 61. Map of boundary concept 3

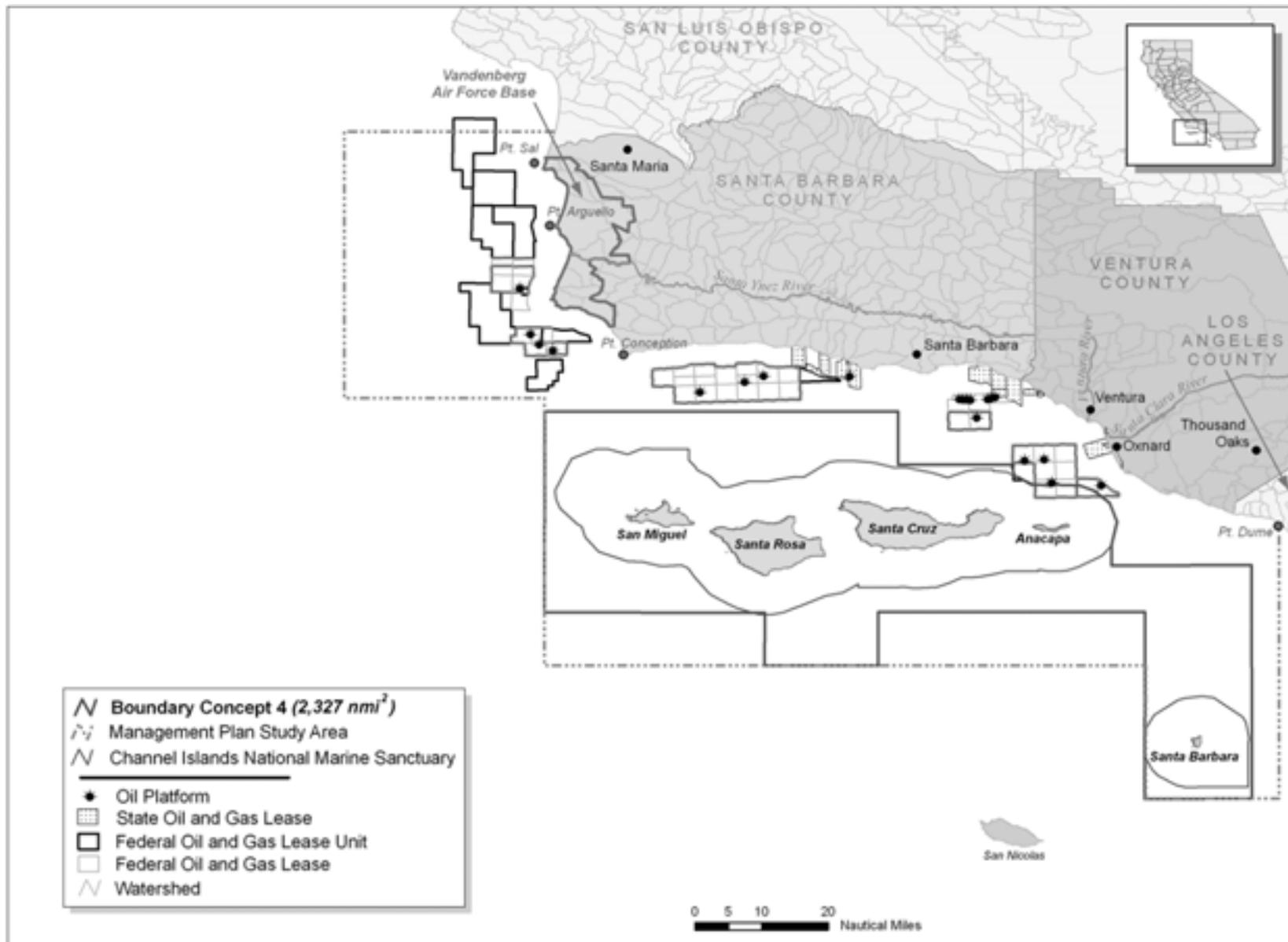


Figure 62. Map of boundary concept 4

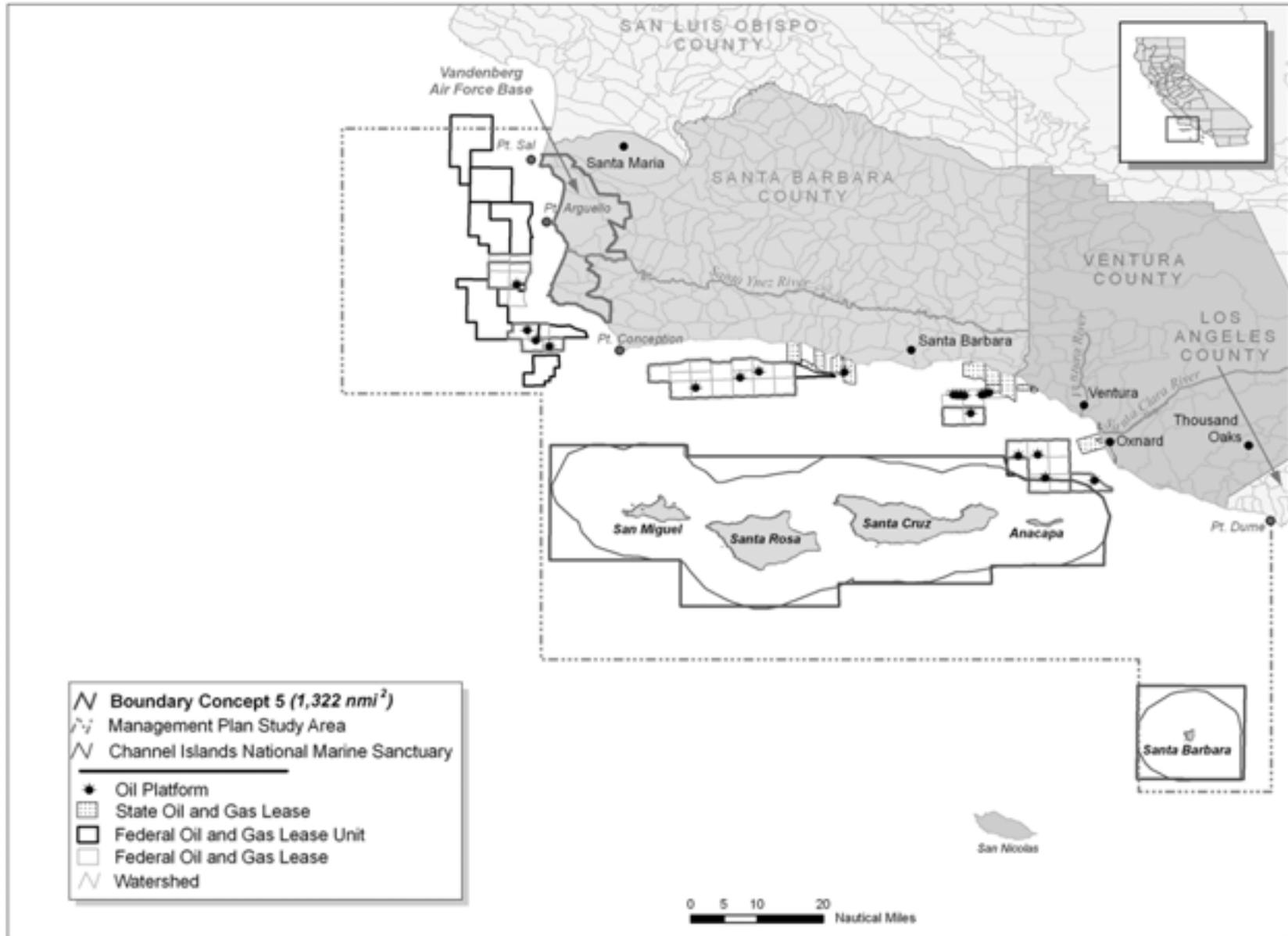


Figure 63. Map of boundary concept 5

Table 26. Comparison of Human Use Attributes for Boundary Concepts*

USES	Significance of Use	Study Area	Status Quo	Preliminary Boundary Concept					
				1	1A	2	3	4	5
Number of harbors	<ul style="list-style-type: none"> Focus of commercial and recreational activities. Source of pollutants from vessel-related activity and maintenance. Source of pollutants from dredging, and from construction and maintenance of piers. 	4	0	4	0	0	0	0	0
Number of commercial fish blocks	<ul style="list-style-type: none"> Impact of concentrated human activity on ecological balance. Impacts from various gear types. 	89	27	89	54	58	43	40	27
Number of military installations	<ul style="list-style-type: none"> Concentration of human activity. Support military activities impacting Sanctuary. 	4	0	4	1	1	1	0	0
Miles of Vandenberg AFB coastline	<ul style="list-style-type: none"> Source of launch, helicopter, and flight test noise impacts. Source of debris disposal into Sanctuary waters. 	35	0	35	35	35	3	0	0
Percentage of concept included in Sea Range	<ul style="list-style-type: none"> Source of noise and explosion impacts. Source of debris disposal. 	70%	95%	80%	55%	75%	70%	90%	95%
Number of producing state oil and gas leases	<ul style="list-style-type: none"> Potential source of environmental pollution. Visual impacts of platforms and facilities. Impacts from decommissioning. 	2	0	2	0	0	0	0	0
Number of producing federal oil and gas leases	<ul style="list-style-type: none"> Potential source of environmental pollution. Visual impacts of platforms and facilities. Impacts from decommissioning. 	19	0	19	0	7	0	0	0
Number of potentially developed federal oil and gas leases	<ul style="list-style-type: none"> Impacts from seismic studies. Impacts from disturbance of the seabed. Impacts from discharge. 	75	0	75	0	62	0	0	0
Percentage of area encompassed by producing or potentially producing oil and gas leases	<ul style="list-style-type: none"> Source of ocean disposal (muds and cuttings). Focus of human activity. Impacts from seismic studies. Impacts from disturbance of the seabed. Impacts from discharge. Potential source of environmental pollution. Visual impacts of platforms and facilities. Impacts from decommissioning. 	9%	0%	9%	0%	11%	0%	0%	0%
Number of active oil and gas support facilities (piers, etc.)	<ul style="list-style-type: none"> Support activities impacting offshore areas. Potential source of environmental pollution. Visual impacts of facilities. 	37	0	37	0	16	0	0	0
Number of aquaculture facilities	<ul style="list-style-type: none"> Potential for introduction of exotic species. Potential impacts on water quality and benthic habitats. 	10	0	10	2	2	0	0	0

Table 26 p. 1 of 2

*Note: data presented in this table was compiled as of 2000.

Table 26. Comparison of Human Use Attributes for Boundary Concepts*

USES	Significance of Use	Study Area	Status Quo	Preliminary Boundary Concept					
				1	1A	2	3	4	5
Number of desalination plants	<ul style="list-style-type: none"> Discharge plume supports only species with broad salinity tolerances Potentially toxic trace elements concentrate in surface layer above discharge plume. Impacts from species entrainment in intakes. 	2	0	2	1	1	0	0	0
Number of Outfalls	<ul style="list-style-type: none"> Source of marine pollution. Sources of pollution to breeding and juvenile development areas for coastal and offshore species. 	10	0	10	4	4	3	0	0
Percent of VTSS within Concept	<ul style="list-style-type: none"> Ships are a source of exotic species. Source of marine pollution. Source of air pollution and noise. Safety issues. 	100%	25%	100%	75%	75%	60%	50%	30%
Percent of area used for recreation (visual estimate)	<ul style="list-style-type: none"> Source of noise disturbance. Source of debris disposal. 	50%	50%	50%	35%	35%	30%	40%	50%

Table 26 p. 2 of 2

*Note: data presented in this table was compiled as of 2000.

Table 27. Comparison of Environmental Attributes for Boundary Concepts*

ATTRIBUTES	Significance of Attribute	Study Area	Status Quo	Preliminary Boundary Concept					
				1	1A	2	3	4	5
Total square miles	<ul style="list-style-type: none"> Indicator of ecosystem representation. 	6,600	1,494	8,731	8,722	5,302	3,492	3,082	1,751
Percentage of total ecosystem represented	<ul style="list-style-type: none"> Extent a complete system is represented. 	100%	19%	100%	62%	57%	43%	36%	21%
Number of plateaus, gyres, banks, & subsea canyons	<ul style="list-style-type: none"> Area's uniqueness connected to geomorphology. Habitat and species diversity. 	7	1	7	5	5	4	3	2
Percentage of continental slope	<ul style="list-style-type: none"> Links to oceanic systems. Promotes upwelling. 	100%	0%	100%	100%	50%	50%	50%	0%
Diversity of bathymetry	<ul style="list-style-type: none"> Benthic habitat and species diversity. 	9	1	9	9	6	5	4	2
Percentage of submerged rocky reef	<ul style="list-style-type: none"> Attachment site for kelp and numerous invertebrates. Food source and habitat protection for fish. 	100%	60%	100%	90%	90%	75%	70%	60%
Percentage of undeveloped mainland coastline	<ul style="list-style-type: none"> Mainland representative of unaltered habitats. Source for comparison studies with islands. 	100%	0%	100%	100%	100%	18%	0%	0%
Number of wetlands	<ul style="list-style-type: none"> Breeding and feeding ground for birds. Support fish and invertebrate larval and juvenile stages. 	4	0	4	4	1	0	0	0
Number of major natural hydrocarbon seeps	<ul style="list-style-type: none"> Unique ecosystem feature and benthic community. 	1,200	0	1,200	900	900	300	0	0
Number of areas of significant upwelling	<ul style="list-style-type: none"> Nutrient supply feeds primary productivity. 	5	2	5	5	5	3	2	2
Number of anoxic basins	<ul style="list-style-type: none"> Unique species assemblage. Nutrient sink. Oil and gas reservoir. 	2	0	2	2	2	2	1	0
Percentage of cetacean migration and feeding corridors (north and south)	<ul style="list-style-type: none"> Vital part of life cycle for a special-status species. 	100%	20%	100%	100%	60%	40%	25%	20%
Percentage of seabird foraging sites	<ul style="list-style-type: none"> Support species diversity and abundance. 	100%	67%	100%	84%	84%	84%	67%	67%

Table 27 p. 1 of 2

*Note: data presented in this table was compiled as of 2000.

Table 27. Comparison of Environmental Attributes for Boundary Concepts*

ATTRIBUTES	Significance of Attribute	Study Area	Status Quo	Preliminary Boundary Concept					
				1	1A	2	3	4	5
Number of known fish larval sources	<ul style="list-style-type: none"> Important part of life history supporting the diversity of commercial and non-commercial fish species. 	2	0	2	2	2	2	2	0
Number of known submerged American Indian sites	<ul style="list-style-type: none"> Record of past uses. Less subject to human intrusion than terrestrial sites. 	53	18	53	49	49	23	18	18
Number of known submerged historic shipwrecks & aircraft sites	<ul style="list-style-type: none"> Recreational interest. Historic significance and information sources. 	169	154	169	169	169	156	154	154
Number of known submerged historic mainland use sites	<ul style="list-style-type: none"> Historic significance and information sources. 	26	0	26	26	20	6	0	0
Percentage of kelp forests represented	<ul style="list-style-type: none"> Keystone species. Provides food, attachment sites, and shelter for invertebrates and fish. Supports juvenile fish. 	100%	55%	100%	100%	70%	60%	55%	55%
Miles of rocky beach represented	<ul style="list-style-type: none"> Transition from onshore to offshore habitats. Rich assortment of species compared to sandy beach. Seabird foraging. Pinniped haulout. 	159	129	159	159	148	132	129	129
Miles of sandy beach represented	<ul style="list-style-type: none"> Transition from onshore to offshore habitats. Shorebird foraging. Pinniped haulout. High recreational interest in accessible mainland areas. 	168	44	168	168	105	53	44	44
Number of seabird colonies	<ul style="list-style-type: none"> Support species diversity and abundance. Representative mainland and island colonies. 	89	37	89	89	83	37	37	37
Number of pinniped haul out areas	<ul style="list-style-type: none"> Supports most diverse pinniped haulout and rookery areas in the world. 	18	13	18	18	16	13	13	13
Number of mainland watersheds	<ul style="list-style-type: none"> Estuaries support juveniles of offshore species. Link to onshore processes. 	5	0	5	5	3	0	0	0
Total mainland watershed area (square miles)	<ul style="list-style-type: none"> Indicator of pollutant, sediment, and nutrient input into Sanctuary waters. 	4,890	0	4,890	4,890	1,299	0	0	0
Percentage of area linked to rural coastal watersheds	<ul style="list-style-type: none"> Basis for evaluation of mainland human impacts by comparison with pristine island watersheds. 	100%	0%	100%	100%	100%	12%	0%	0%

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*Note: data presented in this table was compiled as of 2000.

Biogeographic Study – Executive Summary⁵²

The priority management goal of the National Marine Sanctuary Program (NMSP) is to protect marine ecosystems and biodiversity. This goal requires an understanding of broad-scale ecological relationships and linkages between marine resources and physical oceanography to support an ecosystem management approach. The Channel Islands National Marine Sanctuary (CINMS) is currently reviewing its management plan and investigating boundary expansion. A management plan study area (henceforth, Study Area) was described that extends from the current boundary north to the mainland, and extends north to Point Sal and south to Point Dume. Six additional boundary concepts were developed that vary in area and include the majority of the Study Area. The NMSP and CINMS partnered with NOAA's National Centers for Coastal Ocean Science Biogeography Team to conduct a biogeographic assessment to characterize marine resources and oceanographic patterns within and adjacent to the Sanctuary. This assessment includes a suite of quantitative spatial and statistical analyses that characterize biological and oceanographic patterns in the marine region from Point Sal to the U.S.-Mexico border. These data were analyzed using an index which evaluates an ecological "cost-benefit" within the proposed boundary concepts and the Study Area.

The Sanctuary resides in a dynamic setting where two oceanographic regimes meet. Cold northern waters mix with warm southern waters around the Channel Islands creating an area of transition that strongly influences the regions oceanography. In turn, these processes drive the biological distributions within the region. This assessment analyzes bathymetry, benthic substrate, bathymetric life-zones, sea surface temperature, primary production, currents, submerged aquatic vegetation, and kelp in the context of broad-scale patterns and relative to the proposed boundary concepts and the Study Area. Boundary cost-benefit results for these parameters were variable due to their dynamic nature; however, when analyzed in composite the Study Area and Boundary Concept 2 were considered the most favorable.

Biological data were collected from numerous resource agencies and university scientists for this assessment. Fish and invertebrate trawl data were used to characterize community structure. Habitat suitability models were developed for 15 species of macroinvertebrates and 11 species of fish that have significant ecological, commercial, or recreational importance in the region and general patterns of ichthyoplankton distribution are described. Six surveys of ship and plane at-sea surveys were used to model marine bird diversity from Point Arena to the U.S.-Mexico border. Additional surveys were utilized to estimate density and colony counts for nine bird species. Critical habitat for western snowy plover and the location of California least tern breeding pairs were also analyzed. At-sea surveys were also used to describe the distribution of 14 species of cetaceans and five species of pinnipeds. Boundary concept cost-benefit indices revealed that Boundary Concept 2 and the Study Area were most favorable for the majority of the species-specific analyses. Boundary Concept 3 was most favorable for bird diversity across the region. Inadequate spatial resolution for fish and invertebrate community data and incompatible sampling effort information for bird and mammal data precluded boundary cost-benefit analysis.

The final chapter integrates data and analyses from each of the preceding chapters utilizing two separate approaches. Cost-benefit indices were ranked for each biological group and for the oceanographic/physical parameters to provide a consistent and comprehensive evaluation of the boundary concepts. The Study Area and Boundary Concept 2 (see Chapter 1) ranked highest for the bird, fish, and mammal groups, as well as all the data in composite. The Study Area also ranked highest for macroinvertebrates. Second, select spatial data were integrated, based on data compatibility and spatial

⁵² Additional information on this assessment, including the full report, is on the project website at http://biogeo.nos.noaa.gov/projects/assess/ca_nms/cinms/.

range, to identify areas of spatial coincidence which may reflect ecosystem “hotspots”. Habitat suitability models for fish and macroinvertebrates, along with bird and mammal sightings information were utilized to evaluate this spatial coincidence. Areas of highest spatial coincidence most closely resemble the spatial delineation for the Study Area and also include a broad area from the mainland south through San Clemente Island.

Integration results highlight the Channel Islands and the area extending north to the mainland to Point Conception as an important ecosystem that supports a diverse array of biological communities. The boundary concepts that were favorably ranked incorporated large areas of the coastal mainland, due in part to the nearshore affinity exhibited by many of the analyzed species. Deep offshore environments away from the Channel Islands were correspondingly less favorable. Both the Study Area and Boundary Concept 2 are characterized by areas of increased upwelling, dynamic surface currents and eddies, and persistent thermal fronts. These concepts also include large areas of important habitats such as kelp, seagrasses, and wetlands along with a mixture of deep and shallow waters that many species depend on for all or part of their life cycles.

In compliance with the National Environmental Policy Act, the National Marine Sanctuary Program will incorporate this assessment with cultural and socio-economic analyses to prepare a Supplemental Environmental Impact Statement to fully analyze boundary change concepts.

APPENDIX E: WATER QUALITY PROTECTION RECOMMENDATIONS FROM THE CHANNEL ISLANDS NATIONAL MARINE SANCTUARY ADVISORY COUNCIL

Recommendations excerpted from: A Water Quality Needs Assessment for the Channel Islands National Marine Sanctuary (2005)⁵³

8.1 Water Quality Action Planning Approach

Pursue management activities that maintain and improve water quality conditions that support the Sanctuary's natural and cultural resources, as well as recreational uses in the Sanctuary.

8.2 Research and Monitoring Recommendations (General)

Determine the issues that will drive Sanctuary water quality action planning, and frame research and monitoring questions with the purpose of better understanding how water quality factors affect these key issues.

8.2.1 Existing Data

Compile and characterize existing available water quality-related data (identified in this report) from various long-term research efforts in the SBC region.

8.2.2 Monitoring within Sanctuary Waters

Identify water quality monitoring needs and develop monitoring plan for Sanctuary waters based on the framed research and monitoring questions and the priorities described in this recommendation.

8.2.3 Processing of Existing Samples

Analyze existing samples from the Bight '03 survey and the Pac Baroness exploration and report/store results in a format and location that are compatible with future monitoring outputs.

8.2.4 Monitoring Anchorages at the Islands

Continue a monitoring program at popular Island anchorages beyond the current pilot phase, and adapt the monitoring protocol based on the results of this pilot project.

8.2.5 Anthropogenic Marine Debris

Coordinate with other organizations to form an umbrella partnership that will fulfill the components of an anthropogenic marine debris research and monitoring program, including beach debris monitoring, a trawling study, boater surveys, pelagic plastics sampling study, and photo-documentation.

8.2.6 Storm Water Plume Research

Develop research partnership to better understand the impact of stormwater plumes from Santa Clara and Ventura Rivers on Sanctuary water quality

8.2.7 Large Vessel Traffic Monitoring

Continue to coordinate with the National Marine Sanctuaries Program to pilot an Automated Information System data stream interface and associated installation of a base station on Santa Cruz Island to track and log vessel traffic information to a public database. Pursue opportunities to coordinate with research projects (identified in this report) on Island fog to incorporate sampling for diesel-specific air pollutants

⁵³ Available on line at: <http://channelislands.noaa.gov/sac/pdf/10-17-05.pdf>.

and facilitate predictive modeling of Sanctuary and Channel-wide chronic deposition.

8.3.1 Sewage Discharge Prevention

Draft a single, unambiguous policy to eliminate untreated human waste discharges from near-shore National Park and Sanctuary users (*e.g.* kayakers, surfers, and hikers) that will be implemented with consistency throughout both jurisdictions. Consider policy options (identified in this recommendation) to specifically minimize and eliminate sewage discharges from small vessels.

8.3.2 Strategic Planning and Stakeholder Coordination for Cruise Ship Visitation

Participate in planning by the City of Santa Barbara and other stakeholders for cruise ship visits and get a clear picture of the City's objectives in terms of attracting and accommodating cruise ships to the SBC region. Additionally, make sure that the Sanctuary has a clear goal for policy towards cruise ships in the SBC (outside of Sanctuary waters) and that this policy is presented to the City of Santa Barbara, and review the Voluntary Agreement that ship captains sign before bringing tenders to the Santa Barbara Harbor.

8.3.3 Discharges Outside Sanctuary Boundaries

Consider establishing regulatory authority to protect against pollution that enters Sanctuary waters after being discharged into the ocean outside of CINMS boundaries (such as that maintained by Stellwagen Bank National Marine Sanctuary).

8.3.4 Interagency Water Quality Stakeholder Alliance

Enhance cooperative relations with State and County agencies, and expanded participation and support for existing multi-agency initiatives.

8.3.5 Water Quality Working Group

Establish a working group to the Advisory Council that focuses on water quality management for the Sanctuary.

8.3.6 Pollution Prevention from Large Vessel Traffic

Through partnerships with representatives from other Sanctuaries subject to shipping impacts (such as Stellwagen Bank, Monterey Bay, and Olympic Coast), encourage federal decision makers to take advantage of existing policy opportunities to reduce pollution impacts from ships in SBC waters, and throughout the world ocean (*e.g.* Congressional ratification of Annexes IV and VI of the International Convention on the Prevention of Pollution from Ships [MARPOL]).

8.4 Public Education and Outreach Recommendations

Articulate the interconnections between water, water pollution and the choices and actions of the region's community members. Convey this information to all communities, so that individuals are empowered to help protect and improve water quality from the mainland to the Islands.

8.4.1 CINMS Education and Outreach Initiatives

CINMS should consider organizing a "Snapshot Day" modeled after that conducted annually by MBNMS, in order to build public awareness of—and sensitivity to—the Sanctuary, as well as to gather water quality data and build constructive partnerships with organizations and agencies.

8.4.2 CINMS Sanctuary Education Team (SET)

The SET should incorporate Sanctuary water quality information and messages into its existing campaigns, and consider and plan a range of new outreach initiatives to foster public education on Channel and Sanctuary water quality. The SET should be involved in water quality action planning in

order to help formalize its education and outreach initiatives as components of a CINMS water quality plan.

8.4.3 Channel Islands Naturalist Corps

Sanctuary staff and stakeholders should help prepare talking points on Channel and Sanctuary water quality for the volunteer Naturalists, who also serve on the “front lines” of public education on Sanctuary water quality. The Naturalists should also coordinate these talking points with concessionaire vessel crews.

8.4.4 CINMS and National Park Visitor Education

Develop and advertise (at their websites, visitor centers and the Islands) a specific, consistent and well-advertised human waste disposal policy, and make sure that visitors are enabled to follow the policy (bathrooms or alternative means of disposal are made available).

8.4.5 Boater Education and Outreach

In the short term, offer assistance to harbors (that express an interest and have available resources) for developing new and more effective signs to inform boaters about water quality and clean boating practices. Longer term, coordinate an ongoing program for boater education and outreach involving on-the-water and harbor-based training.

8.4.6 Signs in the Harbors and Near Creeks

Coordinate with local agencies, harbors and other organizations to develop and post more effective signs in both English and Spanish — with messages that convey the connection between individuals’ actions and impacts to Channel and Sanctuary water quality.

8.4.7 Anthropogenic Marine Debris

Look for opportunities to partner with other organizations (*e.g.* NOAA Weather Service and Santa Barbara Creeks Division) to develop public service announcements (PSAs) to encourage good trash management practices (particularly prior to storms).

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